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# University of Missouri

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Welcome to the University of Missouri 2013-2014 catalog! We are pleased to provide an interactive and searchable catalog online.

Information in the catalog is current as of May 2013. The next catalog will be published in May 2014. In the interim, new courses will be announced in myZou (<https://myzou.missouri.edu>) (MU's online student information system), and are usually available in October for the upcoming Spring semester, and in March for the upcoming Summer and Fall semesters. Mid year changes to current courses (titles, descriptions and credit hours) are not reflected here, and will only show in myZou.

Use the search box above, or click on the left hand menus to navigate through the catalog. There is also a PDF version available through the Print Options link above.

We welcome your feedback and suggestions to make this catalog better for the future. We would also appreciate reports of any broken links inside the catalog. Feedback may be provided by sending an email to [mregistrarcatalog@missouri.edu](mailto:mregistrarcatalog@missouri.edu).

Brenda Selman  
University Registrar

# Degrees, Majors (Degree Programs), Emphasis Areas, Minors and Certificates

See tables at the bottom of the page for Keys to the abbreviations.

Degree Programs (emphasis)	College	Undergraduate	Graduate	Law	Medicine	Veterinary Medicine
Accountancy	BUS	BSAcc (p. 320)	MAcc (p. 321), PhD (p. 322)			
Accounting Information Systems	BUS		Cert (p. 342)			
Adult Health Clinical Nurse Specialist	NURS		Cert (p. 590)			
Aerospace	ENGR	Minor (p. 462)				
Aerospace Studies	A&S	Minor (p. 304)				
Afro-Romance Literatures in Translation	A&S	Minor (p. 304)				
Agribusiness Management	CAFNR	BS (p. 36)				
Agricultural Economics (Public Policy*, Financial Planning*)	CAFNR	BS* (p. 39), Minor (p. 40)	MS (p. 41), PhD (p. 41)			
Agricultural Education (Leadership*, Teacher Certification*)	CAFNR	BS* (p. 43), Minor (p. 46)	MS (p. 46), PhD (p. 46)			
Agricultural Leadership	CAFNR	Minor (p. 123)				
Agricultural Systems Management	CAFNR	BS (p. 48), Minor (p. 49)				
Agriculture (Sustainable Agriculture*)	CAFNR	BS* (p. 50)				
Agroforestry	CAFNR		Cert (p. 74)			
Analysis of Institutions and Organizations	CAFNR		Cert (p. 124)			
Ancient Studies	GRAD		Minor (p. 633)			
Animal Sciences	CAFNR	BS (p. 54), Minor (p. 55)	MS (p. 55), PhD (p. 56)			
Anthropology	A&S	BA (p. 134), Minor (p. 135)	MA (p. 135), PhD (p. 136)			
Applied Mathematics	A&S		MS (p. 227)			
Architectural Studies (Architectural Studies*, Interior Design*)	HES	BSHES* (p. 494), Minor (p. 496)	MA (p. 496), MS (p. 497)			
Art	A&S	BA (p. 140), BFA (p. 141), Minor (p. 142)	MFA (p. 142)			

Art History and Archaeology	A&S	BA (p. 145), Minor (p. 147)	MA (p. 147), PhD (p. 148)
Astronomy	A&S	Minor (p. 304)	
Athletic Training	HP	BHS (p. 467)	
Autism and Neurodevelopmental Disorders	GRAD		Cert (p. 635)
Biochemistry	CAFNR	BS (p. 58)	MS (p. 59), PhD (p. 59)
Biological Engineering	ENGR	BSBE (p. 405)	MS (p. 406), PhD (p. 407)
Biological Sciences	A&S	BA (p. 152), BS (p. 153), Minor (p. 153)	MA (p. 154), PhD (p. 154)
Biomedical Science: Comparative Medicine	GRAD		MS (post DVM) (p. 600)
Biomedical Science: Pathobiology	GRAD		MS (p. 601)
Biomedical Science: Veterinary Medicine and Surgery	GRAD		MS (p. 601)
Biomedical Sciences	GRAD		MS (p. 598), PhD (p. 599)
Black Studies	A&S	Minor (p. 304)	Minor (p. 309)
Business	BUS	Minor (p. 336)	
Business Administration (Economics*, Finance and Banking*, International Business*, Management*, Marketing*, Real Estate*)	BUS	BSBA* (p. 326)	MBA (p. 336), PhD (p. 339)
Canadian Studies	A&S	Minor (p. 305)	
Captive Wild Animal Management	CAFNR	Minor (p. 123)	
Center for the Digital Globe	GRAD		Cert (p. 635)
Chemical Engineering (Biochemical*, Environmental*, Materials*)	ENGR	BSCHE* (p. 409)	MS (p. 412), PhD (p. 412)
Chemistry	A&S	BA (p. 156), BS (p. 157), Minor (p. 158)	MS (p. 158), PhD (p. 158)
Civil Engineering	ENGR	BSCiE (p. 415)	MS (p. 416), PhD (p. 416)
Classical Languages	A&S		MA (p. 162)
Classical Studies	A&S		PhD (p. 163)

Classics (Classical Languages*, Classical Humanities*^, Greek*^, Latin*^)	A&S	BA* (p. 160), Minor^ (p. 162)	
Clinical Laboratory Sciences (Medical Technology*)	HP	BHS* (p. 469)	
College Teaching	GRAD	Minor (p. 637)	
Communication	A&S	BA (p. 166)	MA (p. 167), PhD (p. 168)
Communication Science and Disorders	HP	BHS (p. 472)	MHS (p. 473)
Community Processes	GRAD	Cert (p. 638)	
Computational Neuroscience	ENGR	Minor (p. 462)	
Computer Engineering	ENGR	BSCoE (p. 421)	MS (p. 422)
Computer Science	A&S	BA (p. 170)	
Computer Science	ENGR	BS (p. 426), Minor (p. 428)	MS (p. 429), PhD (p. 429)
Conservation Biology	GRAD	Cert (p. 638)	
Diagnostic Medical Ultrasound	HP	BHS (p. 474)	MHS (p. 475)
Digital Global Studies	PROVOST	Cert (p. 632)	
Dispute Resolution	LAW	Cert (p. 645)	
Early Childhood Education	EDUC	BSEd (p. 349)	
East Asian Studies	A&S	Minor (p. 305)	
Economics	A&S	BA (p. 173), BS (p. 174), Minor (p. 175)	MA (p. 175), PhD (p. 176)
Education Policy	EDUC	Cert (p. 397)	
Educational Leadership	EDUC	EdD (p. 356)	
Educational Leadership and Policy Analysis	EDUC	MA (p. 355), MEd (p. 355), EdSp (p. 356), PhD (p. 357)	
Educational Studies (Interdepartmental*)	EDUC	BES* (p. 358)	
Educational and Counseling Psychology	EDUC	MA (p. 351), MEd (p. 352), EdSp (p. 352), PhD (p. 353)	
Electrical Engineering	ENGR	BSEE (p. 438)	MS (p. 439)
Electrical and Computer Engineering	ENGR	PhD (p. 432)	

Elementary Education (Elementary Education*)	EDUC	BSEd* (p. 359)	
Energy	ENGR	Minor (p. 463)	
Engineering	ENGR	Minor (p. 442)	ME (p. 442)
English	A&S	BA (p. 179), Minor (p. 181)	MA (p. 181), PhD (p. 182)
English Writing	A&S	Minor (p. 181)	
Entrepreneurship	PROVOST	Minor (p. 632)	
Environmental Studies	PROVOST	Cert (p. 633)	
European Union Studies	GRAD		Cert (p. 638)
Exercise Physiology	HES		PhD (p. 500)
Family Mental Health Nurse Practitioner	NURS		Cert (p. 590)
Film Studies	A&S	BA (p. 185), Minor (p. 186)	
Financial Literacy for Helping Professionals	HES	Minor (p. 545)	
Financial and Housing Counseling	HES		Cert (p. 546)
Fisheries and Wildlife	CAFNR	BSFW (p. 62)	
Food Safety and Defense	CAFNR		Cert (p. 125)
Food Science	CAFNR		MS (p. 66), PhD (p. 67)
Food Science and Nutrition	CAFNR	BS (p. 64), Minor (p. 66)	
Forestry (Forest Entrepreneurship and Business*, Forest Resource Management*, Individualized Studies*, Urban Forestry*)	CAFNR	BSF* (p. 71), Minor (p. 74)	
French	A&S	Minor (p. 305)	
General Honors	PROVOST	Cert (p. 633)	
General Studies	A&S	BGS (p. 187)	
Genetics Area Program	GRAD		PhD (p. 605)
Geographic Information Science	A&S	Minor (p. 192), Cert (p. 192)	Cert (p. 193)
Geography (General Geography*, Geographic Information Sciences*, Regional/Cultural*, Physical/Environmental*, Urban/Population*)	A&S	BA* (p. 190), Minor (p. 192)	MA (p. 192)



Geological Sciences	A&S	BA (p. 195), BS (p. 196), Minor (p. 197)	
Geology	A&S		MS (p. 197), PhD (p. 197)
Geriatric Care Management	HES		Cert (p. 546)
German	A&S	BA (p. 199), Minor (p. 200)	MA (p. 200)
Gerontological Social Work	HES		Cert (p. 537)
Gerontology	GRAD		Minor (p. 638)
Gerontology	HES		Cert (p. 546)
Grantsmanship	PUBAF		Cert (p. 594)
Health Administration	GRAD		MHA (p. 607)
Health Ethics	GRAD		Cert (p. 639)
Health Informatics	GRAD		MS (p. 610), Cert (p. 612)
Health Science	HP	BHS (p. 478)	
Higher and Continuing Education Administration	EDUC		Cert (p. 397)
History	A&S	BA (p. 202), Minor (p. 203)	MA (p. 203), PhD (p. 205)
Hospitality Management (Conference and Event Planning Management*, Food and Beverage Management*, Lodging Management*, Sport Venue Management*)	CAFNR	BS* (p. 75), Minor (p. 77)	
Human Development and Family Studies (Child Development and Education*, Child Life Specialist*, Family and Consumer Sciences Education*, Family and Lifespan Development*, General Human Development and Family Studies*, General Human Development and Family Studies & Social Work*, Gerontology^)	HES	BSHES* (p. 503), Minor (p. 509)	MA^ (p. 509), MS (p. 510)

Human Environmental Sciences (Architectural Studies*, Human Development and Family Studies*, Human Nutrition Foods and Food Systems Management*, Personal Financial Planning*, Textile and Apparel Management*)	HES		PhD* (p. 512)
Industrial Engineering	ENGR	BSIE (p. 446)	MS (p. 447), PhD (p. 448)
Informatics	GRAD		PhD (p. 614)
Information Science and Learning Technology	EDUC		MA (p. 361), MEd (p. 363), EdSp (p. 363), PhD (p. 364)
Information Technology (Information Systems*, Networks and Wireless Technologies*, Media Technologies*)	ENGR	BS* (p. 449), Minor (p. 451)	
Interdisciplinary (Black Studies*, Environmental Studies*, Peace Studies*, Women's and Gender Studies*)	A&S	BA* (p. 210)	
International Agriculture	CAFNR	Minor (p. 123)	
International Development	GRAD		Minor (p. 639)
International Studies (East Asian Studies*, European Studies*, International Business*, Latin American Studies*, Peace Studies*, South Asian Studies*, Environmental Studies*)	A&S	BA* (p. 216)	
Italian Area Studies	A&S	Minor (p. 305)	
Jazz Studies	A&S	Minor (p. 306), Cert (p. 306)	Cert (p. 310)

Journalism (Convergence Journalism*, Magazine Journalism*, Photojournalism*, Print and Digital News*, Radio-Television Journalism*, Strategic Communication*)	JOURN	BJ* (p. 556), Minor (p. 574)	MA (p. 575), PhD (p. 576)
Latin American Studies	A&S	Minor (p. 306)	
Law	LAW		JD (p. 644)
Law and Conflict Resolution	JOURN		Minor (p. 578)
Leadership and Public Service	A&S	Minor (p. 306)	
Learning, Teaching and Curriculum	EDUC		MA (p. 366), MEd (p. 367), EdSp (p. 367), EdD (p. 368), PhD (p. 368)
Life Span Development	A&S		Cert (p. 310)
Linguistics	A&S	BA (p. 221), Minor (p. 222)	Minor (p. 222)
Luso-Brazilian Area Studies	A&S	Minor (p. 306)	
Mathematics (Actuarial Science and Mathematical Finance*)	A&S	BA (p. 224), BS* (p. 225), Minor (p. 226)	MA (p. 226), MST (p. 229), PhD (p. 230)
Mechanical Engineering (Aerospace Engineering)	ENGR	BSME* (p. 454)	
Mechanical and Aerospace Engineering	ENGR		MS (p. 456), PhD (p. 456)
Medical Pharmacology and Physiology	GRAD		MS (p. 616), PhD (p. 616)
Medical/Health Physics	ENGR	Minor (p. 463)	
Medicine	MED		MD (p. 648)
Medieval and Renaissance Studies	A&S	Minor (p. 307)	Minor (p. 311)
Mental Health Nurse Practitioner	NURS		Cert (p. 590)
Microbiology	GRAD		PhD (p. 619)
Microbiology and Immunology	GRAD		PhD (p. 619)

Middle School Education (Language Arts*, Mathematics*, Science*, Social Studies*)	EDUC	BSEd* (p. 370)	
Military Science	A&S	Minor (p. 307)	
Military Social Work	HES		Cert (p. 537)
Multicultural Education	EDUC		Cert (p. 398)
Multicultural Psychology	EDUC		Minor (p. 398)
Multicultural Studies	A&S	Cert (p. 307)	
Museum Studies	A&S		Minor (p. 312)
Music (Composition*, History*, Music*, Music Theory*, Performance*)	A&S	BA (p. 233), BM* (p. 234), Minor (p. 242)	MA (p. 242), MM (p. 244)
Natural Resources (Agroforestry*; Fisheries & Wildlife Sciences*^; Forestry*^; Human Dimensions of Natural Resources*^; Parks, Recreation & Tourism*^; Soil, Environmental and Atmospheric Sciences*^; Water Resources*^)	CAFNR	Minor (p. 79)	MS* (p. 79), PhD^ (p. 88)
Naval Science	ENGR	Minor (p. 463)	
Neuroscience	GRAD		MS (p. 621), PhD (p. 621), Cert (p. 621)
Nonprofit Management	PUBAF		Cert (p. 594)
Nuclear Engineering	ENGR	Minor (p. 458)	MS (p. 459), PhD (p. 459), Cert (p. 460)
Nuclear Safeguards Science and Technology	ENGR		Cert (p. 460)
Nursing	NURS	BSN (p. 584)	MS (p. 585), PhD (p. 587)
Nursing Practice	NURS		DNP (p. 586)
Nutrition Area Program	GRAD		PhD (p. 623)
Nutrition and Exercise Physiology (Nutritional Sciences*, Exercise Physiology*)	HES		MS* (p. 516)

Nutritional Sciences (Medical Dietetics*, Nutrition and Fitness*, Nutritional Sciences*)	HES	BSHES* (p. 521), Minor (p. 524)	
Occupational Therapy	HP	BHS (p. 480)	MOT (p. 482)
Online Educator	EDUC	Cert (p. 399)	
Organizational Change	PUBAF	Cert (p. 594)	
Parks, Recreation and Tourism (Leisure Service Management*, Natural Resource Recreation Management*, Sport Management*, Tourism Development*)	CAFNR	BS* (p. 94)	
Pathobiology Area Program	GRAD	PhD (p. 626)	
Pathology	GRAD	MS (p. 627)	
Peace Studies	A&S	Minor (p. 307)	
Pediatric Clinical Nurse Specialist	NURS	Cert (p. 590)	
Personal Financial Management Services	HES	Minor (p. 528)	
Personal Financial Planning (Financial Counseling*, Personal Financial Management Services*, Personal Financial Planning*)	HES	BSHES* (p. 526)	MS (p. 529), Cert (p. 529)
Personal Financial Planning for Agricultural Economics majors	HES	Minor (p. 528)	
Personal Financial Planning for Finance majors	HES	Minor (p. 528)	
Philosophy	A&S	BA (p. 248), Minor (p. 249)	MA (p. 249), PhD (p. 249)
Physical Therapy	HP	DPT (p. 483)	
Physics (Astronomy*)	A&S	BA (p. 253), BS* (p. 253), Minor (p. 255)	MS (p. 255), PhD (p. 256)
Plant Sciences (Crop Management*, Horticultural Science and Design*, Breeding, Biology and Biotechnology*, Turfgrass Science*)	CAFNR	BS* (p. 99), Minor (p. 102)	

Plant, Insect and Microbial Sciences	CAFNR		MS (p. 102), PhD (p. 104)
Political Science	A&S	BA (p. 260), Minor (p. 261)	MA (p. 261), PhD (p. 262)
Psychological Statistics and Methods	A&S		Minor (p. 312)
Psychology	A&S	BA (p. 266), Minor (p. 267)	MA (p. 267), PhD (p. 268)
Public Affairs	PUBAF		MPA (p. 592), PhD (p. 593)
Public Health	GRAD		MPH (p. 629), Cert (p. 630)
Public Health: Family and Community Medicine	GRAD		MS (p. 630)
Public Management	PUBAF		Cert (p. 595)
Radioenvironmental Sciences	ENGR	Minor (p. 463)	
Radiologic Sciences (Radiography*, Nuclear Medicine Technology*)	HP	BHS* (p. 486)	
Religious Studies	A&S	BA (p. 269), Minor (p. 270)	MA (p. 270)
Respiratory Therapy	HP	BHS (p. 489)	
Romance Languages (French*^, Spanish*^, Language Teaching^)	A&S	BA* (p. 272)	MA^ (p. 274), PhD (p. 278)
Romance Literatures in Translation	A&S	Minor (p. 308)	
Rural Sociology	CAFNR	Minor (p. 106)	MS (p. 106), PhD (p. 107)
Russian	A&S	BA (p. 283), Minor (p. 283)	
Russian and Slavonic Studies	A&S		MA (p. 284)
Sales and Consumer Development	BUS	Cert (p. 342)	
Science Outreach	A&S		Cert (p. 312)
Science and Agricultural Journalism	CAFNR	BS (p. 110)	
Science and Public Policy	PUBAF		Cert (p. 595)

Secondary Education (Art Education*, Biology*, Chemistry*, Earth Sciences*, General Science*, Language Arts*, Mathematics Education*, Music Education*, Physics*, Social Studies*)	EDUC	BSEd* (p. 378)	
Social Justice	HES	Minor (p. 545)	
Social Work	HES	BSW (p. 532)	MSW (p. 534), PhD (p. 536)
Society and Ecosystems	GRAD		Cert (p. 639)
Sociology	A&S	BA (p. 285), Minor (p. 287)	MA (p. 287), PhD (p. 287)
Soil, Environmental and Atmospheric Sciences (Atmospheric Science*, Environmental Science*, Environmental Soil Science*, Soil Resource Management*)	CAFNR	BS* (p. 113), Minor (p. 121)	
South Asian Studies	A&S	Minor (p. 308)	
Spanish	A&S	Minor (p. 308)	
Special Education (Cross-Categorical*)	EDUC	BSEd* (p. 393)	MA (p. 394), MEd (p. 394), EdSp (p. 395), EdD (p. 395), PhD (p. 396)
Statistics (Biostatistics*)	A&S	BA (p. 290), BS (p. 291), Minor (p. 292)	MA* (p. 292), PhD (p. 293), Minor (p. 295)
Strategic Studies	A&S	Minor (p. 309)	
Sustainable Agriculture	CAFNR	Minor (p. 124)	
Taxation	BUS		Cert (p. 342)
Teaching English to Speakers of Other Languages	EDUC		Cert (p. 399)
Teaching High School Physics	A&S		Cert (p. 258)
Textile and Apparel Management	HES	BSHES (p. 540), Minor (p. 543)	MA (p. 544), MS (p. 544)
Theatre (Performance*, Design/Technical*, Writing for Performance*)	A&S	BA* (p. 297), Minor (p. 298)	MA (p. 299), PhD (p. 300)
Veterinary Medicine	VETM		DVM (p. 649)

Women's and Gender Studies	A&S	Minor (p. 309)	Minor (p. 313)
Youth Development Program Management and Evaluation	HES		Cert (p. 546)
Youth Development Specialist	HES		Cert (p. 546)
Youth Services	CAFNR	Minor (p. 124)	

College abbreviations	
CAFNR	College of Agriculture, Food and Natural Resources
A&S	College of Arts and Science
BUS	College of Business
EDUC	College of Education
ENGR	College of Engineering
GRAD	Graduate School
HP	School of Health Professions
HES	College of Human Environmental Sciences
JOURN	School of Journalism
LAW	School of Law
MED	School of Medicine
NURS	School of Nursing
PROVOST	Office of the Provost
PUBAF	School of Public Affairs
VETM	College of Veterinary Medicine

Degree abbreviations
BA - Bachelor of Arts
BES - Bachelor of Education Studies
BFA - Bachelor of Fine Arts
BGS - Bachelor of General Studies
BHS - Bachelor of Health Science
BJ - Bachelor of Journalism
BM - Bachelor of Music
BS - Bachelor of Science
BSAcc - Bachelor of Science Accounting
BSBA - Bachelor of Science Business Administration
BSBE - Bachelor of Science Biological Engineering
BSChE - Bachelor of Science Chemical Engineering
BSCiE - Bachelor of Science Civil Engineering
BSCoE - Bachelor of Science Computer Engineering
BSEd - Bachelor of Science Education

BSEE - Bachelor of Science Electrical Engineering
BSF - Bachelor of Science Forestry
BSFW - Bachelor of Science Fisheries & Wildlife
BSHES - Bachelor of Science Human Environmental Science
BSIE - Bachelor of Science Industrial Engineering
BSME - Bachelor of Science Mechanical Engineering
BSN - Bachelor of Science Nursing
BSW - Bachelor of Social Work
Cert - Certificate
DNP - Doctor of Nurse Practitioner
DPT - Doctor of Physical Therapy
DVM - Doctor of Veterinary Medicine
EdD - Doctor of Education
EdSp - Education Specialist
JD - Juris Doctorate
LLM - Master of Laws
MA - Master of Arts
MAcc - Master of Accounting
MBA - Master of Business Administration
MD - Doctor of Medicine
ME - Master of Engineering
MEd - Master of Education
MFA - Master of Fine Arts
MHA - Master of Health Administration
MHS - Master of Health Science
MM - Master of Music
MOT - Master of Occupational Therapy
MPA - Master of Public Affairs
MPH - Master of Public Health
MS - Master of Science
MST - Master of Science for Teachers
MSW - Master of Social Work
PhD - Doctor of Philosophy



# Requirements - University Level

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## Undergraduate

Undergraduate Requirements (University) (p. 17)

Common Credit Limitations (p. 17)

General Education Requirements (p. 18)

## Degree Audits for Undergraduates

The degree audit is an automated report reflecting a student's academic progress toward the completion of a degree.

**MU students who have attended since August 2007** can request a degree audit by logging in to [myZou](#) and navigating to Self Service, then Student Center, and clicking on "Request Degree Audit." The audit automatically pulls in the student's MU course work, transfer courses and courses in progress.

**MU students who have NOT attended since August 2007** can request a degree audit by contacting the Academic Advising Unit of the division in which they were last enrolled at MU. For contact information, go to <http://advising.missouri.edu/contact/>.

**For newly admitted or prospective students**, MU degree audits can be created at <http://www.transfer.org>. Information on the college credits already earned will have to be manually entered before it can be evaluated against current degree requirements.

For additional details on degree audits, go to <http://registrar.missouri.edu/degree-audits/index.php>.

## Graduate and Professional

Master's Requirements (University) (p. 19)

Educational Specialist Requirements (University) (p. 23)

Doctoral Requirements (Graduate School) (p. 24)

Doctoral Requirements (Law School) (p. 29)

Details on the academic requirements for medical students can be found at <http://medicine.missouri.edu/education/curriculum.html>.

Details on the academic requirements for veterinary medical students can be found at <http://vetmed.missouri.edu/current.htm>.

## Undergraduate Requirements (University)

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Undergraduate students must complete all University requirements as well as all requirements specified for the degree(s) and major(s), and requirements of the college or school, and department offering the degree. This would include the University general education requirements as well as the following:

- A second MU Writing Intensive course\* must be completed in a student's major. It needs to be a 3000/4000 level MU WI course approved as part of the curriculum by the faculty of a student's major.
- Complete an approved capstone course\* with MU course work in the student's major

- Complete 30 of the last 36 credits with MU authored courses
  - Students may transfer more than 64 credit hours for lower division courses from either Missouri associate degree-granting or baccalaureate degree-granting institutions. Any additional lower division course credits above 64 credit hours will be accepted in transfer if the credits are applicable to the baccalaureate degree or are prerequisites for an upper division course in the major
  - Complete all University, general-education requirements (See the University General Education Requirements section in the catalog.)
  - Earn no less than a 2.00 GPA, as defined by the GPA of Record
  - Complete any additional divisional, degree or major requirements as specified by the academic unit offering the degree
- \* Must be completed with a grade of C- or better.

## Common Credit Limitations

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The following credit limitations are applicable to all undergraduate students, regardless of degree program. Please check with advisor for more information.

### Chemistry

- A student can earn a maximum of 10 hours of credit towards graduation from the following courses: CHEM 1000 Introductory Chemistry, CHEM 1320 College Chemistry I, CHEM 1330 College Chemistry II. CHEM 1310 (General Chemistry I) is also included in this maximum if you took the course prior to Fall 2013.

### Economics

- Students may not receive credit towards graduation for more than one of the following courses: ECONOM 1014 Principles of Microeconomics, ECONOM 1024 Fundamentals of Microeconomics, ECONOM 1051 General Economics, or AG\_EC 1041 Applied Microeconomics.
- Students may not receive credit towards graduation for more than one of the following courses: ECONOM 1015 Principles of Macroeconomics, ECONOM 1051 General Economics, or AG\_EC 1042 Applied Macroeconomics.

### History

- Students may not earn credit towards graduation for both HIST 1100 Survey of American History to 1865 and HIST 1400 American History.
- Students may not earn credit towards graduation for both HIST 1200 Survey of American History Since 1865 and HIST 1400 American History.

### Mathematics

- Students can only have a total of 5 hours of credit towards graduation from the following courses: MATH 1320 Elements of Calculus, MATH 1400 Calculus for Social and Life Sciences I, MATH 1500 Analytic Geometry and Calculus I.

### Physics

- Students may not earn credit towards graduation for both PHYSCS 1210 College Physics I and PHYSCS 2750 University Physics I.
- Students may not earn credit towards graduation for both PHYSCS 1220 College Physics II and PHYSCS 2760 University Physics II.

## Psychology

- Students may not receive credit towards graduation for more than one of the following courses: PSYCH 2410 Developmental Psychology, H\_D\_FS 3420 Early and Middle Childhood, or ESC\_PS 2500 Child Development.

## Statistics

- Students may not receive credit towards graduation for more than one of the following courses: STAT 1200 Introductory Statistical Reasoning, STAT 1300 Elementary Statistics, or STAT 1400 Elementary Statistics for Life Sciences.
- Students may not receive credit towards graduation for more than one of the following courses: STAT 2500 Introduction to Probability and Statistics I or STAT 2530 Statistical Methods in Natural Resources.
- Students may only receive a maximum of 4 hours of credit towards graduation from the following courses: STAT 1200 Introductory Statistical Reasoning, STAT 1300 Elementary Statistics, STAT 1400 Elementary Statistics for Life Sciences, STAT 2200 Introductory Statistical Methods, STAT 2500 Introduction to Probability and Statistics I, or STAT 2530 Statistical Methods in Natural Resources.

## General Education Requirements

General education requirements are the foundation of knowledge upon which all University of Missouri degrees are built. They are specifically intended to prepare students as citizens who must make informed judgments about issues that go beyond the narrow area of their academic specialization.

Students must complete the University General Education Requirements listed below. With careful planning, some courses may be chosen to meet both University General Education Requirements and one or more of the divisional, degree and major requirements. Students are strongly encouraged (and in some divisions they are required) to meet with an academic advisor to ensure adequate progress towards the selected degree and major.

While transfer students are also required to complete all University General Education Requirements, transfer credit may meet these requirements. Refer to the Transfer Credit and Degree Applicability policy (p. 685) for more details.

More information can be found at: <http://generaleducation.missouri.edu/about/>.

### Common University General Education Requirements for all MU degrees

- College Algebra (MATH 1100) or transferable equivalent<sup>1</sup> (3 credits). Students may satisfy this requirement by:
  - Completing an appropriate math course (MATH 1100 or MATH 1160),
  - Completing a calculus course at MU (MATH 1400, MATH 1500, MATH 1700, or MATH 2300)<sup>1</sup>, which provides back-credit for MATH 1100 (or MATH 1160),
  - Passing the Proctored ALEKS Exam with a sufficient score, thereby demonstrating proficiency in College Algebra, or
  - Possessing the minimum ACT or SAT Math subscores, thereby providing an exemption (See [mathplacement.missouri.edu](http://mathplacement.missouri.edu) for further details)

- English Exposition and Argumentation (ENGLISH 1000 or ENGLISH 1000H) or transferable equivalent<sup>1</sup> (3 credits)
  - This course in expository prose, which stresses writing as a process involving critical reading and thinking skills, should be taken during your freshman year.
- Writing Intensive course<sup>1, 2, 3</sup> (6 credits, 2 courses)
- American History or Government<sup>2, 5</sup> (3 credits)
- Math Reasoning Proficiency Course<sup>1, 2</sup> (these courses must state that College Algebra is a prerequisite)
- Distribution Requirement (27 credits) providing a breadth and depth of knowledge in three broad areas of study. The course work must include at least one course numbered 2000 or higher in two of the areas of distribution as described below.
  - Must include 9 credits in these sciences: biological science, physical science, and / or mathematical science<sup>4</sup>
  - including at least one biological or physical science and its related laboratory component<sup>6</sup>
  - representing two different areas of science
  - Must include 9 credits of behavioral and/or social science
  - Courses must be from at least two different departments in these areas
  - Must include 9 credits of humanities and/or fine arts
  - including courses from at least two different departments in these areas
    - Of special note related to the humanities and or fine arts distribution:
  - Only one course of specified of Humanities and Fine Arts courses can be counted.
  - For specified courses, the category will be designated per section per semester.
  - Students in CAFNR, Engineering, SHP, HES, SNR, and Nursing may use this course towards fulfillment of the humanities distribution requirement, but only if the entire 12-13 hour elementary language sequence is completed. This course may NOT be used to fulfill the humanities requirement in A&S, Business, Education, Journalism and Social Work.
  - For the full list of courses that fulfill this distribution and the noted exceptions, go to: <http://generaleducation.missouri.edu/courses/>

- 1 Must be completed with a grade of C- or better.
- 2 Designated courses may also be used toward the distribution requirement.
- 3 Course must be taken at MU unless requirement is waived via completion of an AA degree from a regionally-accredited, Missouri institution.
- 4 Must be courses in mathematics or statistics with College Algebra as a prerequisite.
- 5 Fulfills State Law Requirement.

- <sup>6</sup> The term “laboratory” is used in reference to courses or portions of courses that satisfy the following criteria:
- They provide students with an opportunity for the active collection and/or analysis of data from real-world observations and experiments. These activities need not take place in a conventional “laboratory” setting but may be undertaken anywhere that an appropriate experiment or observation can take place (e.g., in the field).
  - They promote scientific literacy and critical thinking/problem solving skills.
  - Whenever possible, they include opportunities for students to design experimental or observational protocols.
  - If the laboratory is directly associated with a specific lecture course or is included as part of a course that also includes lecture, the laboratory activities promote understanding of the content presented in the lecture.

## Master's Requirements (University)

The purpose of this section is to provide an overview of Graduate School's policies. Students considering a master's degree should read all of the information below to fully understand the requirements of advanced study (e.g., residency, plan of study and time lines for completion) at MU.

MU confers a variety of master's, dual master's degrees (<http://gradschool.missouri.edu/academics/process/dual-masters-process>) or **dual master's/ professional degrees** to students who satisfy the general requirements of the Graduate School and the specific requirements of the degree-granting department or area program. Designated **graduate minors** and **certificates** are available in some academic fields. **Thesis and non-thesis options** are available for select plans of study; students must consult with individual degree programs for more information.

### Master's Residency Requirements

The faculty of each graduate program determines its own residency requirements for master's degrees, subject to initial review by the Graduate Faculty Senate. Consult with the academic program for requirements. For academic programs that choose to maintain the traditional regulation concerning residency for master's students, the following applies: the student must complete a minimum of 24 semester hours of MU graduate courses which are taught by MU faculty and which are approved by the academic program and the Graduate School. Students who cannot fulfill residency requirements are encouraged to consider Mizzou Online for available degrees.

### Graduation and Commencement Deadlines and Forms

It is recommended that students refer often to the Graduation & Commencement Deadlines for Master's Students ([http://gradschool.missouri.edu/forms-downloads/repository/graduation\\_deadlines.pdf](http://gradschool.missouri.edu/forms-downloads/repository/graduation_deadlines.pdf)) to avoid missing any important graduation or commencement deadlines. In addition to various deadlines, student must also submit a variety of necessary paperwork. By the end of the first year of master's work at MU, a student must begin submitting degree program forms, which will aid the department and the Graduate School in planning an academically appropriate course of study and in tracking the student's progress toward degree completion. These forms include the following:

*Program of Study.* Outlines the course work to be included in the student's degree program. Due in the Graduate School by the end of the second semester unless the degree can be completed in two semester.

In that case, the form is due by the end of the first semester. Plan of Study (M1) form (pdf) (<http://gradschool.missouri.edu/forms-downloads/repository/m1.pdf>) Request for Thesis Committee (thesis option only). Is a membership proposal for the student's thesis committee. Due in the Graduate School by the end of the second term. Request for Thesis Committee (M2) form (pdf) (<http://gradschool.missouri.edu/forms-downloads/repository/m2.pdf>)

*Report of Master's Examining Committee.* Reports the results of the thesis defense, master's comprehensive exam, project presentation, portfolio review, etc. Due in the Graduate School two weeks prior to graduation. Report of Master's Examining Committee (M3) form (pdf) (<http://gradschool.missouri.edu/forms-downloads/repository/m3.pdf>).

### Choosing an Advisor

Graduate Committee Membership for Jointly Appointed Faculty Chapter 320 of the Collected Rules and Regulations for the University of Missouri requires that all jointly appointed faculty members will have designated Primary Appointment and Primary Departments well as affiliation with one or more involved academic programs. These affiliations affect membership status of jointly appointed faculty on graduate student committees as follows:

- Faculty members may serve as adviser/committee chair when their Primary Appointment is in the graduate student's home academic program.
- When the graduate student's home academic program is the involved academic program for a jointly appointed faculty member, this person may serve as chair/advisor with the approval of the director of graduate studies from the student's home academic department.
- A faculty member can serve as an Internal Member only when their Primary Appointment is in the graduate student's home academic program.
- When a graduate student's home academic program is the involved academic program for a jointly appointed faculty member, he or she may serve as either an Internal or External Member of the committee.

### Graduate Committee Membership for Adjunct Faculty

Adjunct Faculty may serve as a Committee Chair or Committee Member only in academic programs in which they are appointed and approved for Graduate or Doctoral Faculty membership as appropriate for the student's degree (Master's or Doctoral). Service on graduate committees outside the academic program in which they are appointed requires a recommendation by the director of graduate studies from the student's home academic program and approval by the vice provost for advanced studies and dean of the Graduate School.

### Master's Plan of Study

minimum credit hours for degrees The Graduate School has established a campus wide minimum of 30 hours of graduate credit beyond the bachelor's degree (or its equivalent) for a master's degree. Fifteen of the 30-hour minimum must be selected from courses numbered at 8000 or 9000 level. No more than 40 percent of the 30-hour credit requirement can be satisfied by a combination of special investigations, Research, Readings and / or Problems courses. Master's Plan of study. (<http://gradschool.missouri.edu/academics/process/plan-of-study/masters.php>)

## Completing a Plan of Study Form

After performing satisfactorily for a minimum of one semester, the student, with the advisor's assistance, completes the Plan of Study form (pdf) (<http://gradschool.missouri.edu/forms-downloads/repository/m1.pdf>) that outlines the plan of study for the student's graduate program. The form is forwarded through the academic program's director of graduate studies to the Graduate School for approval. The Plan of Study form must be filed with the Graduate School by the end of the student's second semester of enrollment. Upon approval of the program by the Graduate School, the student is a candidate for the degree. If a change is necessary to a student's approved Plan of Study form, a Plan of Study Substitution form (<http://gradschool.missouri.edu/forms-downloads/repository/subform.pdf>) must be used.

**Note:** An academic program may have additional credit hour (or other) requirements. Check with the program of interest to confirm degree requirements.

## Transfer Credit Toward a Master's Degree

A maximum of 20 percent of the number of credit hours required for a student's degree may be graduate credits transferred from another university, including another campus of the University of Missouri system upon the recommendation of the advisor, the approval of the academic program director of graduate studies and the Graduate School.

**Note:** the above represents a change in policy and becomes effective for graduate students beginning their master's programs during the fall semester 2001. Students who began their master's programs prior to the fall semester 2001 have the option of using the above regulation or the regulation in place at the time they began their degree program. The MU Graduate School will review the transfer request to determine if the credit meets the minimum guidelines.

If so then the Graduate School will process the request so that each transfer course will appear on the student's transcript.

## How to Request Transfer of Credit

1. The request or transfer credit must first be approved by the student's advisor and the department's director of graduate studies.
2. Once approved the student submits his/her Plan of Study or Course Substitution form to add the transfer work to the Plan of Study along with an unopened, official transfer transcript if one is not currently on file with the Graduate School.
3. Once the Graduate School has received the request it will be reviewed to determine if minimum requirements have been met.
4. If approved then the Graduate School will process the request so that the transfer credit appears on the MU student record.

## Minimum Transfer Requirements

Transfer course work:

- must be less than eight years old by the time the master's degree is conferred;
- was taken for graduate credit and clearly marked as such on the transfer transcript, complete with credit hours and a grade;
- is limited to no more than 20 percent of the total course work on the student's Plan of Study form;
- is from a regionally accredited institution in the U.S. or an overseas institution that is recognized by its country's Ministry of Education as a graduate degree granting institution; and

- is not extension or correspondence credit (see policy on correspondence credit above)

## Credit Toward a Second Master's Degree

A student who has completed one master's degree at the University of Missouri or elsewhere may, upon recommendation of the advisor and approval by the academic program's director of graduate studies and the Graduate School, present a maximum of eight hours of credit earned in the previous program toward a second master's degree.

## Forming a Master's Thesis Committee

When a thesis is required for completion of a master's degree, the student is required to submit a Request for Thesis Committee (M2 form) (<http://gradschool.missouri.edu/forms-downloads/repository/m2.pdf>) or a dual-masters Request for Thesis Committee (DM2 form) (<http://gradschool.missouri.edu/forms-downloads/repository/dm2.pdf>) for approval by the academic program's director of graduate studies and the Graduate School by the end of the student's second semester. A thesis committee is composed of three members of the MU faculty: a major advisor from the academic program, a second reader from the academic program and an outside reader who is a member of the graduate faculty from a different MU graduate program.

After the Request for Thesis Committee form has been filed, any changes must be submitted through the Change of Committee form (<http://gradschool.missouri.edu/forms-downloads/repository/cocform.pdf>).

## Approval of a Non-MU Faculty Member

Upon approval of the academic program's director of graduate studies, the student may petition the Graduate School to allow a person who is not a member of the MU graduate faculty to serve as the third reader. The petition should include a written justification for such a request and a copy of the person's curriculum vitae. The Graduate School maintains copies of curricula vitae previously received and approved, and if such a request is anticipated, the student should contact the Graduate School to see if the curriculum vitae of a particular person is already on file.

## The Thesis Process

If a thesis is required, it must be the student's own work and must demonstrate a capacity for research and independent thought. A student writing a thesis should refer to the Graduate School's Guidelines for Preparing Theses and Dissertations (<http://gradschool.missouri.edu/forms-downloads/repository/etd-guidelines.pdf>). Academic programs may have additional requirements. The Graduate School sets deadlines for master's students (<http://gradschool.missouri.edu/academics/graduation-commencement/timeline-deadlines/master-timeline.php>) for completion and submission of the thesis.

## Thesis Acceptance

A thesis must be approved by the major advisor, a second reader from the academic program and an outside reader who is a member of the graduate faculty from a different MU graduate program. Students need to supply committee members with copies for review/evaluation. After successfully defending the thesis, the student will make any needed adjustments in format and corrections, based on input from the committee. The thesis is then submitted as PDF file on a CD ROM to the Graduate School by the established master's deadline.

Review the Graduate School's web pages for additional information on the master's thesis process (<http://gradschool.missouri.edu/academics/thesis-dissertation/process>).

A searchable thesis and dissertation archive is maintained by the Graduate School.

## Grades at the Graduate Level-Graduation Requirement

To become eligible for a master's degree, a student must have completed all MU graduate work attempted with a GPA of 3.0 (A=4.0) or higher. Review grading policies (p. 674) for more information.

## Examination Process

### Thesis Option

Where a thesis is presented in partial fulfillment of graduation requirements, students must form a thesis committee. In the final semester, the student must successfully present (defend) the thesis. Three members of the student's committee must sign the Report of the Master's Degree Examining Committee (pdf) (<http://gradschool.missouri.edu/forms-downloads/repository/m3.pdf>), which is then forwarded through the academic program's director of graduate studies to the Graduate School by the semester deadline.

### Non-Thesis Option

Where no thesis is presented by the candidate, a final examination committee, composed of three members from the academic program, is designated by the academic program's director of graduate studies with the approval of the Graduate School. During the final semester, the Report of the Master's Examining Committee (pdf), signed by the director of graduate studies, is forwarded to the Graduate School by the semester deadline. All candidates for the MA or MS degrees must complete either a thesis or a substantial independent project that cannot be coauthored.

## Enrollment at the Master's Level

For general master's enrollment requirements go to the Graduate School's web page on master's enrollment requirements (<http://gradschool.missouri.edu/academics/progress/graduate-stud-progress/master-stud-progress.php>).

## Enrollment

The master's candidate must be enrolled at the University during the semester or session in which a thesis is defended, a master's project is presented, or the completion of a master's comprehensive exam is certified.

## Scheduling Exams, etc.

Comprehensive exams, thesis defenses, portfolio presentations and the like may be offered during the regular semester session. Dates that are excluded from graduation examinations include breaks between regular semester sessions, national holidays where the University is not in operation and weekends.

## Enrollment for Graduate Examination

Master's and educational specialist degree candidates who have completed all requirements except the final examination or the defense of the thesis/project must be enrolled when the final examination is given or the thesis/project is defended. Students who do not wish to enroll in course work during this time can enroll in "Graduate Examination" hours only.

**Note:** Registration in the "Graduate Examination" does not count toward enrollment certification. Students enrolled in the "Graduate Examination" would not be considered full-time or part-time.

Graduate students must be enrolled in at least nine credit hours to be considered full-time students and at least four credit hours to be considered half-time students during fall and spring terms. For summer terms, graduate students must be enrolled in four hours to be considered full-time and two hours to be considered half-time students.

Students with financial aid or a visa should discuss plans with the Student Financial Aid (<http://financialaid.missouri.edu>) office before registering for Graduate Examination hours. International students with a visa should discuss plans with MU's International Center (<http://international.missouri.edu>) before registering for the Graduate Examination. Failure to do so could cause serious consequences for a student's financial aid or visa status.

## How Enrollment Status Affects Access to Campus Resources

Students who enroll in the Graduate Examination will not have a valid student ID and thus will not have regular access to the Student Health Center, MU Libraries, the Student Recreation Center or campus computing centers. If a student needs to use any of these services, registration in a one-, two-, or three-hour course (including graduate research courses) is required. Extra fees apply for access too.

## Time Limit for Master's Degree Completion

The program for the master's degree must be completed within a period of eight years beginning with the first semester of enrollment in which the student is accepted to a degree program or from the date of the oldest coursework used on the plan of study. Individual academic programs may stipulate a shorter time period. Time spent in the armed services will not count toward the eight-year limit (see also Active Duty Policy). For any extension of this time limitation, the student must petition the Graduate School by submitting a request to the advisor who, in turn, submits a written recommendation to the Graduate School that is endorsed by the academic program's director of graduate studies. The Graduate School will notify the advisor in writing of the final decision.

For academic advice or assistance with degree program planning, students should contact their advisors. See master's graduation requirements. (<http://gradschool.missouri.edu/academics/graduation-requirements/masters-grad-requirements.php>)

## Reasonable Rate of Progress for Master's Students

Reasonable rate of progress is governed by both the campus-wide policies of the Graduate School as well as academic program regulations which may be more restrictive. Failure to satisfy the Graduate School's rate of progress policies leading to dismissal is handled by the Request for Extension (<http://gradschool.missouri.edu/policies/progress/extension-appeal.php>) process.

## Deadline for Submission of Thesis After Successful Defense

After successful defense of the thesis or dissertation, students must comply with their academic program's and/or the International Center's enrollment requirements. Students are required to submit their final dissertation or thesis by the end of the following semester after a

successful defense unless a letter asking for an extension is submitted to the Graduate Dean by the student's advisor and program's DGS.

## Extension Requests for Master's Students

Extenuating circumstances that inhibit a student's rate of progress are handled through the Request for Extension (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>) process.

## Dismissal

Dismissals arising from violation of academic program policies may be appealed using the Appeals Process. For additional details, graduate students should refer to the Dismissal Policy (<http://gradschool.missouri.edu/academics/progress/probation-termination.php>) and the Extension Requests and Appeals Process (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>).

## Dual Degrees: Master's Students

As the US workforce becomes increasingly interdisciplinary, some master's students elect to concurrently pursue two advanced study degrees. All dual-degree programs at the graduate level require Graduate Faculty Senate approval. Please refer to the A-Z list of graduate degree programs (<http://gradschool.missouri.edu/academics/programs/a-z>) to learn what is currently available.

The two types of dual master's degrees are the dual master's degree and the dual master's-professional degree.

Degree Type	Dual Master's Degree	Dual Master's-Professional Degree
Description	This is a cooperative degree, arranged between two graduate degree granting programs and approved by the Graduate Faculty Senate.	This is a cooperative degree arranged between a graduate degree granting program and a professional degree granting program (e.g., law or medicine) and approved by the Graduate Faculty Senate.

Application Processes	Students must simultaneously submit a separate application to both degree programs to be considered for admittance. Because some students may not be aware of an approved dual-degree program before their arrival at MU, the option to participate in an approved dual-degree program may be postponed until no later than the end of a student's second semester at MU. Start your online application process at <a href="http://gradschool.missouri.edu/admissions/index.php">http://gradschool.missouri.edu/admissions/index.php</a>	The Graduate School oversees the master's degree portion of the dual master's/professional degree. Students must apply to both the Graduate School and the professional program, notifying both of their interest in the dual program. Start your online application process to the Graduate School at <a href="http://gradschool.missouri.edu/admissions/index.php">http://gradschool.missouri.edu/admissions/index.php</a>
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Forms and Policies	Students must fill out an Application for Dual Enrollment (pdf) no later than the end of a student's second semester at MU.	For Graduate School policies and forms pertaining to the master's portion of the dual master's/professional degree, refer to the Master's Degrees Requirements and Policies on the website.
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## Note on Dual Degrees for Law Students

Dual-degree programs with the Law School enable students to earn the Juris Doctor (JD) concurrently with a Master's or PhD degree. Dual-degree students must fulfill entrance requirements for both schools, including the graduate school's entrance exam (if required) and the LSAT. Contact the Law School (p. 643) for more information on their dual-degree programs.

## Note on Dual Degrees for Medical Students

Additional information concerning medical dual degrees for both master's and doctoral students can be found on the doctoral dual degree (<http://gradschool.missouri.edu/academics/graduation-requirements/dual-degree-requirements.php>) page.

## Counting Credits

A student must complete a minimum of 18 hours of graduate courses for each degree program respectively. A minimum of 3 hours must be 8000-level courses. Additionally, the student must complete 12 hours of shared 8000-level graduate credit, which can include thesis/project research credit, as applicable.

Thus,  $18 + 18 + 12 = 48$  hours of graduate credit which is the minimum total hours for a dual master's degree program.

For example, for a dual master's degree program in Applied Mathematics and Electrical Engineering, a student's plan of study must show 18 hours of Applied Mathematics graduate course work that applies only to the

Applied Mathematics degree and 18 hours of Electrical Engineering graduate course work that applies only to the Electrical Engineering degree. The additional 12 hours of shared 8000-level graduate credit brings the total earned graduate credit hours to 48.

## Transfer Credit

Up to eight hours of transfer credit may be applied as follows: to one of the two degree programs, or divided between the two degree programs. The eight hours of transfer credit cannot be applied to each degree program separately.

## Advising & Committees

There will be a separate advisor and committee for each degree program.

*Dean's Note:* the option of a combined committee structure may be included in proposals for Graduate Faculty Senate consideration, e.g., co-advisors who would also serve as outside members, plus one additional member from each degree program, for a total of four committee members.

## Dual Degree Progress Forms

Special dual master's degree program forms will be used to certify plans of study, committee members and final defense/examinations. The forms are available from the Master's Requirements Time Line (<http://gradschool.missouri.edu/academics/graduation-commencement/timeline-deadlines/master-timeline.php>).

## Conferral of Dual Degrees

The Graduate School will confer two separate diplomas upon completion of all degree program requirements.

## Educational Specialist Requirements

This degree, offered through the College of Education, is a 30-hour program of specialization built upon the education specialist degree, of which 24 hours must be taken with MU faculty. Six semester hours must be completed within one semester or summer session to provide an in-residence experience. Students have eight years to complete the degree from the time they are first admitted to the degree program. A student is required to take a final examination, and the report of the results must be approved by a majority of the candidate's advisory committee members and submitted to the Graduate School. For additional information on the Educational Specialist degree (<http://gradschool.missouri.edu/academics/graduation-requirements/educ-spec-requirements.php>), consult the College of Education's site (<http://education.missouri.edu>).

## Required Educational Specialist Forms

The Graduate School obtains students' official academic records as soon as they complete their first terms of enrollment. Each of the following forms is completed at the departmental/program level, routed for required signatures and forwarded to the Graduate School in 210 Jesse Hall.

Forms are reviewed by staff in the Graduate School, given the vice provost/ dean's signature if approved, and a copy is returned to the academic program office. If changes/corrections are needed, or if any signatures are missing, the forms will be returned to the department for corrective measures. If any faculty signatures are illegible, we ask that departments print a correct spelling below any such signatures.

Request for the Educational Specialist Advisory Committee (<http://gradschool.missouri.edu/forms-downloads/repository/s1.pdf>) (S-1 form, PDF)

The S-1 form serves as official documentation of who serves on a student's advisory committee. It should be submitted to the Graduate School by the end of a student's second semester.

Plan of Study for the Educational Specialist Degree (<http://gradschool.missouri.edu/forms-downloads/repository/s2.pdf>) (S-2 form, PDF)

The S-2 form provides the student, academic program/department and Graduate School with a plan for all the course work that will comprise a plan of study. It serves as a general plan to follow. Changes on the plan of study can be made easily by submitting a Course Substitution form (<http://gradschool.missouri.edu/policies/masters/requirements/subform.pdf>), available from departments or the Graduate School. The S-2 form should be submitted to the Graduate School preferably by the end of a student's second semester and no later than the beginning of a student's second year of study.

Report of the Educational Specialist Examining Committee (<http://gradschool.missouri.edu/forms-downloads/repository/s3.pdf>) (S-3 form, PDF)

This form is submitted by the academic program/department and reports the final results of a student's comprehensive examination. Students are encouraged to consult with their departments to make sure the departments submit the S-3 form shortly after the exam has been graded. transfer credit toward the education specialist degree A maximum of 20 percent of the number of credit hours required for a student's degree may be graduate credits transferred from another university, including another campus of the University of Missouri system upon the recommendation of the adviser, the approval of the academic program director of graduate studies and the Graduate School.

**Note:** The above represents a change in policy and becomes effective for graduate students beginning their education specialist programs during the fall semester 2001. Students who began their education specialist programs prior to the fall semester 2001 have the option of using the above regulation or the regulation in place at the time they began their degree program. The MU Graduate School will review the transfer request to determine if the credit meets the minimum guidelines. If so then the Graduate School will process the request so that each transfer course will appear on the student's transcript.

## How to Request Transfer of Credit

1. The request or transfer credit must first be approved by the student's adviser and the department's director of graduate studies.
2. Once approved the student submits his/her Plan of Study or Course Substitution form to add the transfer work to the Plan of Study along with an unopened, official transfer transcript if one is not currently on file with the Graduate School.
3. Once the Graduate School has received the request it will be reviewed to determine if minimum requirements have been met.
4. If approved then the Graduate School will process the request so that the transfer credit appears on the MU student record.

## Minimum Transfer Requirements

Transfer course work:

- must be less than eight years old by the time the education specialist degree is conferred;

- was taken for graduate credit and clearly marked as such on the transfer transcript, complete with credit hours and a grade;
- is limited to no more than 20 percent of the total course work on the student's Plan of Study form;
- is from a regionally accredited institution in the U.S. or an overseas institution that is recognized by its country's Ministry of Education as a graduate degree granting institution; and
- is not extension or correspondence credit (see policy on correspondence credit above)

## Special Types of Credit for the Educational Specialist Degree

A maximum of six semester hours completed with a grade of B or better may be accepted in transfer from institutions accredited to offer doctoral degrees. Off-campus courses authorized for graduate credit and offered by MU faculty members and courses offered through the Center for Independent Study taught by MU faculty may be included in the program.

## Grades at the Graduate level-Graduation requirement

To become eligible for an education specialist degree, a student must have completed all MU graduate work attempted with a GPA of 3.0 (A=4.0) or higher. Review grading policies (p. 674) for more information.

## Enrollment

The educational specialist candidate must be enrolled at the University during the regular semester session in which comprehensive exams are taken, portfolio or project is presented, etc.

## Time Limit for Education Specialist Degree Completion

The program for the education specialist degree must be completed within a period of eight years beginning with the first semester of enrollment in which the student is accepted to a degree program or from the date of the oldest coursework used on the plan of study. Individual academic programs may stipulate a shorter time period.

Time spent in the armed services will not count toward the eight-year limit (see Active Duty Policy (<http://veterans.missouri.edu/forms/active-duty.php>)). For any extension of this time limitation, the student must petition the Graduate School by submitting a request to the adviser who, in turn, submits a written recommendation to the Graduate School that is endorsed by the academic program's director of graduate studies. The Graduate School will notify the adviser in writing of the final decision.

For academic advice or assistance with degree program planning, students should contact their advisers.

## Reasonable Rate of Progress for Education Specialist Students

Reasonable rate of progress is governed by both the campus wide policies of the Graduate School as well as academic program regulations which may be more restrictive. Failure to satisfy the Graduate School's rate of progress policies leading to dismissal are handled by the Request for Extension process, and the decision of the vice provost for advanced studies and dean of the Graduate School in these matters is binding.

## Extension Requests for Education Specialist Students

Extenuating circumstances that inhibit a student's rate of progress are handled through the Request for Extension (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>) process. The decision regarding an extension is made by the vice provost for advanced studies and dean of the Graduate School, and is binding.

## Dismissal

Dismissals arising from violation of academic program policies may be appealed using the Appeals Process. For additional details, graduate students should refer to the Dismissal Policy (<http://gradschool.missouri.edu/academics/progress/probation-termination.php>) and the Extension Requests and Appeals Process (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>) pages on the Graduate School website.

## Doctoral Requirements (Graduate School)

The Graduate School grants two types of doctoral degrees: the doctor of philosophy (PhD) and the doctor of education (EdD). Consult with individual departments to learn about the availability of degrees. To obtain either doctoral degree, a student must follow the general regulations of the Graduate School well as special requirements of the degree program. It is the student's responsibility to adhere to all regulations and satisfy the graduation requirements of the Graduate School and the degree program. An individual who has held, at any time, a regular tenure-track appointment in an MU academic program is not eligible for a doctoral degree from that department or the area program in which that department participates.

## Doctoral Qualifying Examination or Process

Prior to official admission into a doctoral program, the student must pass a qualifying examination or process. A department or area program may limit the number of times this examination or process may be attempted. After the qualifying process is complete and the doctoral committee has been confirmed, the Qualifying Examination Results and Doctoral Committee Approval (D1) (<http://gradschool.missouri.edu/forms-downloads/repository/d1.pdf>) form should be submitted to the Graduate School, no later than the end of the second semester of enrollment.

## Selecting a Doctoral Adviser

The student selects an adviser or co-advisers, by mutual consent, from doctoral faculty members who are dissertation supervisors in the department or area program in which the major work is planned. In the event that an adviser retires or leaves MU, he/she may continue to serve as a student's adviser unless there is written academic program policy prohibiting such an arrangement. If an adviser is unable or unwilling to continue to serve, the academic program, with the leadership of the director of graduate studies, will assist to ensure that a replacement is found.



## Forming a Doctoral Program Committee

The doctoral program committee must be recommended by the student's adviser and approved by the academic program's director of graduate studies and the Graduate School before one year has elapsed following the student's first registration as a doctoral student. The Qualifying Examination Results and Doctoral Committee Approval (D1) (<http://gradschool.missouri.edu/forms-downloads/repository/d1.pdf>) form is due to the Graduate School office by the end of the student's second semester.

## Committee Changes

Changes to the committee must be submitted on the Change of Committee form.

## Duties

All members of the doctoral program committee will be intimately involved and will actively participate in the activities of the doctoral student at all the stages of the student's career at MU, except in some cases in the qualifying examination/process. The committee also may participate in the assessment of a student's background and potential for success in the academic program's doctoral program. Committee members may call a meeting of the full committee at any time to discuss the student's progress.

## Membership Requirements for Doctoral Committees

The doctoral program committee shall be composed of a minimum of four members of the MU graduate faculty and will include at least three members from the student's doctoral degree program and an outside member from a different MU program. At least two of the doctoral committee members must be MU doctoral faculty. (Note: This policy is effective for students who begin their doctoral programs during the Fall 2005 Term. For students who began their doctoral programs before the fall 2005 semester, consult the appropriate catalog or the Graduate School.)

Additional committee members with specialized expertise who do not meet the criteria for the MU graduate faculty or doctoral faculty may serve on a doctoral committees as a fifth or sixth member, with special permission of the dean of the Graduate School.

## Graduate Committee Membership for Jointly Appointed Faculty

Chapter 320 of the Collected Rules and Regulations ([http://www.umsystem.edu/ums/rules/collected\\_rules/personnel/ch320](http://www.umsystem.edu/ums/rules/collected_rules/personnel/ch320)) for the University of Missouri requires that all jointly appointed faculty members will have a designated Primary Appointment and Primary Department as well as affiliation with one or more involved departments or units. These affiliations affect membership status of jointly appointed faculty on graduate student committees as follows:

### Committee Chair/Adviser

A faculty member may serve as adviser/committee chair when his or her primary appointment is in the graduate student's home academic program. When the graduate student's home academic program is the involved academic program for a jointly appointed faculty member, the person may serve as chair/adviser with the approval of the director of graduate studies from the student's home academic program.

## Doctoral Committee Member

A faculty member can serve only as an Internal Member when his or her Primary Appointment is in the graduate student's home academic program. When a graduate student's home academic program is the Involved academic program for a jointly appointed faculty member, he or she may serve as either an Internal or External Member of the committee.

## Graduate Committee Membership for Adjunct Faculty

Adjunct faculty may serve as a committee chair or committee member only in academic programs in which they are appointed and approved for graduate or doctoral faculty membership as appropriate for the student's degree (master's or doctoral). Service on graduate committees outside the academic program in which an adjunct member is appointed requires a recommendation by the director of graduate studies from the student's home academic program and approval by the dean of the Graduate School.

## Doctoral Plan of Study & Degree Requirements

The doctoral program committee provides academic program approval of the student's Plan of Study which will prepare the student for research or scholarly investigation in the chosen field of study. The plan of study includes a list of the courses and the credit to be earned. By successfully completing the plan by deadlines, a doctoral student will:

- Prepare the student for research or scholarly investigation in the chosen field of study.
- Satisfy the credit-hour and residency requirement of the academic program.
- Satisfy any special requirements (proficiency in foreign languages, collateral field, doctoral minor, other special research skills) imposed by the department or area program.
- Satisfy the Graduate School's requirement for a minimum of 15 hours of MU coursework at the 8000/9000 level (exclusive of research, readings, and problems).

The committee also recommends to the dean of the Graduate School, as part of the Plan of Study, any request for transfer of graduate credit. Changes to the plan of study should be submitted on the Plan of Study Course Substitution form (<http://gradschool.missouri.edu/forms-downloads/repository/subform.pdf>).

## Doctoral Credit-Hour Requirement

MU requires a minimum of 72 semester hours beyond the baccalaureate degree for the PhD and EdD degrees. The student's doctoral program committee must approve all course work used to satisfy the credit-hour requirement and may require additional course work beyond these minimums.

## Transfer Credit

The doctoral committee may recommend up to 30 hours of post-baccalaureate graduate credit from an accredited university be transferred toward the total hours required for the doctoral degree. It is the responsibility of the doctoral committee to determine the appropriateness of course work for transfer credit. All requests for exceptions to this policy must be approved by the dean of the Graduate School.

*Note:* This policy applies to students who begin their enrollment during the Fall Term 2006 and subsequent semesters. For students who began their doctoral programs prior to the fall 2006 semester, consult the appropriate catalog or the Graduate School for policies pertaining to transfer of credit.

## Extension & Correspondence Credit in Doctoral Programs

The doctoral committee may recommend that courses taken through MU's Extension division be counted toward the credit-hour requirement. Extension or correspondence course work from institutions other than MU may not be used to meet the total hours required for the doctoral degree.

## Time Limits on Transfer Credits

All courses to be applied to the plan of study must be completed within eight years of filing the plan.

## Grades at the Graduate Level

To become eligible for a degree, a doctoral student must have completed all MU graduate work attempted with a GPA of 3.0 (A=4.0) or higher. Review grading policies (p. 674) for more information.

## Foreign Language Proficiency

In general, an English-speaking student may establish foreign language proficiency, if it is required, by demonstrating an ability to translate into English two foreign languages; or by demonstrating a high order of fluency in one language; that is the ability to read, write and converse in that language and to translate that language into English and English into that language.

## Plan of Study Completion Before Doctoral Comprehensive Exam

The student must substantially complete the course work outlined in the Plan of Study to the satisfaction of the doctoral program committee and the Graduate School before being declared ready for the comprehensive examination (<http://gradschool.missouri.edu/academics/process/doctoral-process/comprehensive-exam.php>).

## Doctoral Comprehensive Examination

The student must be enrolled to take the doctoral comprehensive examination (<http://gradschool.missouri.edu/academics/process/doctoral-process/comprehensive-exam.php>). It is to be administered only when MU is officially in session. The comprehensive examination is the most advanced posed by MU. It consists of written and oral sections. It must be completed at least seven months before the final defense of the dissertation. The two sections of the examination must be completed within one month.

## Written Section

The written section or sections of the examination may be conducted in one or both of the following two ways:

1. The written sections may be arranged and supervised by the major adviser, in which case questions are prepared and graded by the doctoral program committee.

2. The major adviser may delegate responsibility for arranging, preparing, supervising and grading the written sections of the examination to one or more departmental/program committees appointed for this purpose.

## Successful Completion

For the comprehensive examination to be successfully completed, the doctoral program committee must vote to pass the student on the entire examination, both written and oral sections, with no more than one dissenting or abstaining vote. A report of examination results, carrying the signatures of all members of the committee, must be sent to the Graduate School and the student no later than two weeks after the comprehensive examination is completed.

## Exam Failure

A failure of either the written or oral section of the exam constitutes failure of the comprehensive exam. If a failure is reported, the committee also must include in the report an outline of the general weaknesses or deficiencies of the student's work. The student and the committee members are encouraged to work together to identify steps the student might take to become fully prepared for the next examination.

## Request for Clarification

If the student believes that the advice given by the committee is inadequate, the student may send a written request for clarification to the committee. A copy of this request should be sent to the Graduate School as well. The committee must respond to this request in writing within two weeks and a copy must be filed with the Graduate School.

## Retaking the Comprehensive Examination

The student who fails may not take a second comprehensive examination for at least 12 weeks. Failure to pass two comprehensive examinations automatically prevents candidacy.

## Doctoral Candidacy & Continuous Enrollment

Candidacy for a doctoral degree is established by passing the comprehensive examination. Status as a continuous enrollment doctoral student begins the term after the term in which the comprehensive exam was successfully completed. Students must maintain continuous enrollment during their candidacy (the period after successful completion of the comprehensive examination).

## Procedure for Continuous Enrollment

Candidacy is maintained by enrolling in 9090 Research (or 9990 Research for some Engineering students) for two semester hours each fall and spring semester and for one semester hour each summer session up to and including the term in which the dissertation is defended. Continuous enrollment provides access to an adviser's support, doctoral program committee guidance and university research facilities for completion of the dissertation. Failure to enroll continuously in two hours of approved courses until the doctoral degree is awarded terminates candidacy.

## Reestablishing Candidacy After Time Off

Candidacy may be reestablished by paying the registration and late fees owed and completing the requirements specified by the student's doctoral program committee. Registration fees owed may not exceed the amount owed for seven terms, regardless of the number of terms beyond

seven for which the student failed to continuously enroll. The committee's requirements may include a second comprehensive examination or evidence of currency in the research field as suggested by publications in refereed journals. Candidacy is reestablished when the student's adviser and the departmental, area program or divisional director of graduate studies submits a written request to the Graduate School explaining the basis for the decision. Once approved, a Request to Re-enroll form (pdf) (<http://gradschool.missouri.edu/forms-downloads/repository/reenroll.pdf>) must be completed by the student and sent to the department/program for processing.

## The Doctoral Dissertation

The dissertation must be written on a subject approved by the candidate's doctoral program committee, must embody the results of original and significant investigation and must be the candidate's own work.

## Enrollment Status and Reporting

The candidate must be continuously enrolled (<http://gradschool.missouri.edu/admissions/types-of-enrollment/continuous-enrollment.php>) to defend the dissertation, which can only be defended when MU is officially in session. A report of the dissertation defense (<http://gradschool.missouri.edu/forms-downloads/repository/d4.pdf>), carrying the signatures of all members of the committee (<http://gradschool.missouri.edu/academics/process/forming-committees/doctoral.php>), is sent to the Graduate School before the deadline preceding the anticipated date of graduation. For the dissertation to be successfully defended, the student's doctoral committee must vote to pass the student on the defense with no more than one dissenting or abstaining vote.

## Required Dissertation Format

Every doctoral candidate should review the Guidelines for Preparing Theses and Dissertations from the Graduate School and should consult the director of graduate studies for academic program style requirements. All dissertation defenses shall be open to the general faculty. Academic programs are encouraged to announce dissertation defense dates to academic program colleagues.

## Submission of Dissertation to the Graduate School

The final copy of the dissertation must be submitted to the Graduate School as a PDF file on a CD-ROM. Specific instructions are provided in the Guidelines for Preparing Theses and Dissertations.

## Reasonable Rate of Progress

Reasonable rate of progress is governed by both the campus wide policies of the Graduate School listed below as well as academic program regulations which may be more restrictive. Failure to satisfy the Graduate School's rate of progress policies leading to dismissal is handled by the Request for Extension process (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>). For academic advice or assistance with degree program planning, students should contact their advisers. Dismissals arising from violation of academic program policies may be appealed using the Appeals Process (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>). Students should also refer to the section on the Dismissal

Policy (<http://gradschool.missouri.edu/academics/progress/probation-termination.php>) for additional details.

## Time Limits for Doctoral Degree Completion

Three Graduate School policies govern the Reasonable Rate of Progress established for doctoral students. To determine which is applicable to a particular student, see the policies below:

### Students Who Began Their Program in Fall 2000 to the Present

Effective fall semester 2000, a doctoral student must successfully complete the comprehensive examination within a period of five years beginning with the first semester of enrollment as a PhD student. In addition, the program for the doctoral degree must be completed within five years of passing the comprehensive examination. Individual departments or area programs may stipulate a shorter time period. For an extension of this time the student must petition the Graduate School by submitting a request to the adviser who, in turn, submits a written recommendation to the Graduate School which has been endorsed by the department or area program director of graduate studies.

### Doctoral Students Who Passed Comps Between Fall 1994 and Summer 2000

Doctoral candidates who passed their comprehensive examinations between the beginning of the fall semester 1994 through summer session 2000 will have no more than five years after passing the comprehensive examination to complete the doctoral degree.

### Doctoral Students who Passed Comps Before Fall 1994

Doctoral candidates who passed their comprehensive examinations before fall semester 1994 must complete their degree programs within eight calendar years beginning with the first semester of enrollment as a doctoral student.

## Doctoral Degree Extension Request

Regardless of when a student entered the program or passed the comprehensive exam, any candidate requiring additional time must submit a request for an extension. On petition of the candidate and the candidate's academic program, an extension of time may be granted by the Graduate School. Academic programs specifically reserve the right to re-certify currency in the discipline. All requests for extensions should be endorsed by the academic program's director of graduate studies and accompanied by a description of the process whereby currency in the discipline is certified, if required by the academic programs. See also Active Duty Policy (<http://veterans.missouri.edu/forms/active-duty.php>).

## Doctorate of Education (EdD): Special Requirements and Policies

### Admission

To be admitted into a doctorate of education program, the student must have attained the degree of master of arts with a major in education, a degree of master of education, or the quantitative and qualitative equivalent of one of these degrees from an accredited college or university.

## EdD Qualifying Exam

If required, the qualifying examination must be successfully completed before the plan of study is determined by the adviser and the student in cooperation with the doctoral advisory committee. This program must constitute a well organized plan of professional specialization in one of the major fields of education, with one or more supporting fields.

## EdD Plan of Study

A minimum of 72 semester hours of graduate level course work beyond the bachelor's degree is required for the degree of doctor of education degree. The plan of study is specifically intended to meet the professional needs of the candidate. As well as pursuing course work in the professional areas of specialization, the student must take courses in educational statistics, advanced educational statistics, methods of educational research and one research elective course. Foreign languages are not required, except as may be determined by the student's doctoral advisory committee.

## EdD Advisory Committee

The student's adviser officially recommends for the approval by the Graduate School a doctoral advisory committee of at least five members. For students admitted Fall 2006 and later, the requirement is at least four committee members. In addition to planning the doctoral program with the student, this committee may administer a qualifying examination, which helps to assess the student's general background and potential for the EdD degree. It also guides the planning of the plan of study.

## EdD Comprehensive Examination

When the doctoral advisory committee determines that the needed course work has been completed with satisfactory grades, it plans the comprehensive examination (a written and oral examination that includes the candidate's major field of interest) for the degree. This examination must be taken no earlier than the second year of graduate work and be completed at least seven months before graduation. A student must be enrolled to take the comprehensive examination. It is not administered unless MU is officially in session.

For the comprehensive examination to be completed successfully, the committee must vote to pass the student with no more than one dissenting or abstaining vote. If failure is reported, the committee recommends suggested work or remedial measures. See Comprehensive Examination (<http://gradschool.missouri.edu/academics/process/doctoral-process/comprehensive-exam.php>) under PhD Degree Regulations.

The student who fails may not take a second examination for at least 12 weeks. Failure on two comprehensive examinations automatically prevents candidacy.

## Continuous Enrollment

EdD candidates are subject to the same policies and procedures as PhD candidates. See enrollment requirement (p. 668)s for graduate studies.

## Dissertation Defense

EdD candidates are subject to the same policies and procedures as PhD candidates. The dissertation must be reviewed and approved by the doctoral program committee. (<http://gradschool.missouri.edu/academics/thesis-dissertation/dissertation-process.php>)

## Time Limits for Doctoral Degree Completion

Effective fall semester 2000, a doctoral student must successfully complete

- the comprehensive examination within a period of five years beginning with the first semester of enrollment as a PhD student.
- the doctoral degree within five years of passing the comprehensive examination.

Individual departments or area programs may stipulate a shorter time period.

For time limit policies prior to academic year 2000-2001, consult the Graduate School Catalog archive dissertation format EdD candidates are subject to the same dissertation formatting and submission requirements as PhD candidates. The dissertation must be reviewed and approved by the doctoral program committee. Polices can be found at <http://gradschool.missouri.edu/policies/doctoral/requirements/dissertation.php>.

## Dissertation Submission

The final copy of the EdD dissertation must be submitted to the Graduate School as a PDF file on a CD-ROM. Specific instructions are provided in the Guidelines for Preparing Theses and Dissertations (<http://gradschool.missouri.edu/forms-downloads/repository/etd-guidelines.pdf>).

## Deadline for Submission of Dissertation/Thesis after Successful Defense

After successful defense of the thesis or dissertation, students must comply with their academic program's and/or the International Center's enrollment requirements. Students are required to submit their final dissertation or thesis by the end of the following semester after a successful defense unless a letter asking for an extension is submitted to the Graduate Dean by the student's advisor and program's DGS.

## Doctoral Degree Extension Request

Regardless of when a student entered the program or passed the comprehensive exam, any candidate requiring additional time must submit a request for an extension. On petition of the candidate and the candidate's academic program, an extension of time may be granted by the Graduate School.

Academic programs specifically reserve the right to re-certify currency in the discipline. All requests for extensions should be endorsed by the academic program's director of graduate studies and accompanied by a description of the process whereby currency in the discipline is certified, if required by the academic programs. (See also Active Duty Policy.)

## Doctoral Dual Degrees

### Dual Doctoral-Professional Degrees

As the US workforce becomes increasingly interdisciplinary, some graduate students elect to concurrently pursue a PhD (doctoral) degree in combination with a law or medical (professional) degree. Examples include the MD/PhD and the JD/PhD. Dual degrees are cooperatively arranged between a graduate degree granting program and a professional degree granting program. The Graduate School oversees the doctoral (PhD) degree portion of the dual doctoral/ professional degree. Dual degrees are approved by the Graduate Faculty Senate.

Students must apply to **both** the Graduate School and the professional degree program, notifying both of their interest in a dual program. Please refer to the A-Z list of graduate degree programs (<http://>

gradschool.missouri.edu/academics/programs/a-z) to learn what is currently available.

Because some students may not be aware of an approved dual-degree program before their arrival at MU, the option to participate in an approved dual-degree program may be postponed until no later than the end of a student's second semester at MU.

The governing policies for dual degrees are the same for master's and doctoral students. Please refer to the dual-degree information for master's students (<http://gradschool.missouri.edu/academics/process/dual-masters-process>) for more information.

## Dual Degrees for Medical Students

The MD/PhD program is for the student seeking a biomedical research career. Additional years are integrated into the medical curriculum to satisfy requirements for the PhD. (A MD/MS dual degree is another option). The graduate degree (MS or PhD) is typically accomplished after completion of the MD program. PhD programs are available in diverse areas at MU.

Students are accepted to the joint program by a single committee. Students interested in this dual-degree program should inquire at the dean's office in the School of Medicine.

## Financial Support

Financial support may be provided for the graduate portion of the dual-degree program. Fellowship support may be provided for the PhD portion of this program, while loan and scholarship funds may be available for the MD curriculum.

## Applying Credit

Students participating in the MD/PhD Program at the University of Missouri may apply up to 30 hours of credit for courses taken during the preclinical phase of the MD program towards the 72 hour requirement for the PhD degree. These MD courses, however, cannot be used to satisfy the requirement for 15 hours of 8000/9000 of graduate level course work.

The following table lists the distribution of credits for the preclinical courses among areas of study that can be used by the student and their committee in determining how many credit hours should be applied toward the PhD.

Course	Applicable Hours Toward the PhD
Biochemistry	6 hrs
Microbiology	4 hrs
Immunology	3 hrs
Pharmacology	4 hrs
Physiology	4 hrs
Pathology	6 hrs
Neurosciences	3 hrs

## Advising & Committees

There will be a separate adviser and committee for each degree program.

*Dean's Note:* the option of a combined committee structure may be included in proposals for Graduate Faculty Senate consideration, e.g., co-advisers who would also serve as outside members, plus one additional member from each degree program, for a total of four committee members.

## Dual Degree Progress Forms

Special dual degree program forms will be used to certify plans of study, committee members and final defense/examinations.

## Timelines for PhD Completion

Policies governing doctoral degree completion, including but not limited to examinations, forms, continuous enrollment, and dissertation format, defense and submission, are detailed in the doctoral degree requirements section of the Graduate Catalog and web site.

## Conferral of Dual Degrees

Upon completion of all degree program requirements, the Graduate School and the professional school will confer separate diplomas.

## Doctoral Requirements (School of Law)

The Juris Doctor (J.D.), or "law degree," is a three year post-baccalaureate program. Students must complete 89 credit hours of law courses roughly one-half of which are required courses.

[View JD Degree Requirements Here \(p. 644\)](#)

The wide variety of academic courses are complemented by a variety of clinics and skills courses designed to provide graduates with a solid foundation for the practice of law.

# Undergraduate & Graduate

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Information in the catalog is current as of May 2013. The next catalog will be published in May 2014. In the interim, new courses will be announced in myZou (<https://myzou.missouri.edu>) (MU's online student information system), and are usually available in October for the upcoming Spring semester, and in March for the upcoming Summer and Fall semesters. Mid year changes to current courses (titles, descriptions and credit hours) are not reflected here, and will only show in myZou.

## Undergraduate Study

MU grants 25 percent of the bachelor's degrees from Missouri public universities, providing an intellectually diverse environment and 360-degree learning for students from every state in the nation and more than 120 countries.

MU offers more than 300 degree programs through 19 colleges and schools and is a member of the prestigious Association of American Universities. Ninety-two percent of full-time, ranked faculty hold doctorates or the highest degree in their field. A highly interdisciplinary campus, it's common for faculty and students from one school at Mizzou to collaborate on projects with those from other schools and colleges.

For example, some courses in the sciences are taught in conjunction with MU's medical school, and humanities classes include such areas as music composition and creative writing.

MU also offers an honors college for high-achievers and unmatched real-world experiences, including managing a bed and breakfast (The Gathering Place), operating a floral shop (Tiger Garden), preparing income taxes for families, studying abroad, volunteering for credit, providing health care, working at the country's only university-owned TV network affiliate (KOMU), performing at Carnegie Hall and co-authoring articles in leading scientific journals. Mizzou students also hold patents and create startup companies.

For more information about undergraduate study, contact Undergraduate Admissions (<http://admissions.missouri.edu>).

## Graduate Study

The University of Missouri Graduate School offers nearly 100 master's degree programs, over 70 doctoral degree programs, and 6 educational specialist degree programs; 13 graduate minors; and 40+ graduate certificates. Opportunities for e-learning, including online graduate degrees, are available. An A-Z list of graduate degrees is available in this catalog as part of a total MU degrees listing (p. 5). For more information, contact Graduate Admissions (<http://gradschool.missouri.edu>).

## College of Agriculture, Food and Natural Resources

### Administration

Thomas L. Payne, Vice Chancellor and Dean/Director, MO Agriculture Experiment Station

Bryan L. Garton, Associate Dean and Director, Academic Programs

Marc Linit, Associate Dean, Research, Outreach, Associate Director Agriculture Experiment Station

Sharyn Freyer-muth, Assistant Dean, Academic Programs

David E. Baker, Assistant Dean and Program Director, Ag & Natural Resources Extension

Matt Pournay, Director of Study Abroad

College of Agriculture, Food and Natural Resources

Office of Academic Programs

Dickinson Student Achievement Center

2-64 Agriculture Building

(573) 882-8301

<http://cafnr.missouri.edu>

The School of Natural Resources

124 Anheuser-Busch Natural Resources Building

(573) 882-7045

<http://www.snr.missouri.edu>

### About the College

The mission of the College of Agriculture, Food and Natural Resources (CAFNR) includes excellence in teaching and advising, cutting-edge research and the dissemination of that research to the people of Missouri.

From entering freshmen to postdoctoral scientists, students receive personal attention in preparing for a wide range of careers. Professional development through career services, student organizations, and engagement with business and industry prepares graduates to have an impact in the food system, business, government policy, environmental awareness, conservation, law, medicine and other areas.

The Missouri Agricultural Experiment Station develops life science technologies in animal, biochemical, plant, food and natural resource sciences to keep the state's agribusiness system competitive in world markets and to provide consumers with a safe, low-cost food supply. Science research faculty lead our state and nation in debate and development of science-based policies for agriculture and natural resources.

Finally, the college helps the global community more fully develop their economies through improved agriculture. This global mission provides a valuable exchange of knowledge and understanding among students, teachers and scientists from many cultures.

The College of Agriculture, Food and Natural Resources was established at the University of Missouri in 1870 as the state's land-grant university in response to the need for agricultural teaching and research in Missouri. The four major divisions in the college, the Agricultural and Natural Resources Experiment Station, Academic Programs, Agricultural and Natural Resources Extension and International Programs, continue to have a great influence on Missouri's economy.

### Undergraduate

- Admissions
- Special Programs (Pre-Veterinary Track and Pre-Medical Track)
- Degree Options
- Bachelor of Science Degree Requirements
- Additional CAFNR Requirements
- CAFNR Honors Requirements
- Probation, Suspension and Dismissal
- Advising
- Career Services and Professional Opportunities
- On-Campus Internships
- Internships
- Study Abroad
- Student Activities

### Admissions

Students admitted to the University of Missouri are encouraged to enter the College of Agriculture, Food and Natural Resources, including the School of Natural Resources, as freshmen.

### Special Programs

#### Preveterinary Track

Students wishing to prepare for application to the College of Veterinary Medicine may enroll in the College of Agriculture, Food and Natural Resources under programs that emphasize science, such as animal sciences or fisheries and wildlife sciences. In satisfying the science program requirements, the requirements for entering veterinary medicine also may be satisfied.

A minimum of 60 credits is required for admission to the College of Veterinary Medicine. Before applying, a student should make certain that the requirements listed below have been satisfied. Questions concerning required admission credits should be directed to the College of Veterinary Medicine. (Note: Tracks are not listed on transcripts or diplomas.)

Composition or courses in communication skills	6
College Algebra or more advanced mathematics	3
Inorganic Chemistry	8
Organic Chemistry (requires laboratory)	5
Biochemistry (requires organic chemistry prerequisite)	3
Physics (comprehensive introductory course or courses) **	5
Biological Science	10
Social Science and/or Humanistic Studies	10
Electives	10
<b>Total Credits</b>	<b>60</b>

\*\* 5 hrs. in only the first of a companion series in introductory physics will not suffice.

#### Premedical Track

Students interested in a medical career may choose from a variety of science-based majors. The most common choice of students is biochemistry because it is a collaborative program between CAFNR and

the School of Medicine. Questions concerning required admission credits should be directed to the School of Medicine. (Note: Tracks are not listed on transcripts or diplomas.) The following course work is required for admission:

English composition	2	semesters
College-level mathematics (or calculus eligibility)	1	semester
General biology, including laboratory	8	credits
Inorganic chemistry, including laboratory	8	credits
Organic chemistry, including laboratory	8	credits
General physics, including laboratory	8	credits

## Degree Options

In many majors, students are allowed to tailor the program of study to their professional goals. Students may choose courses that provide them with strong technical expertise or select those that provide business expertise. Others who are preparing for graduate or professional schools may be interested in a strong science education. All of these options are available within the majors.

## Bachelor of Science (B.S.) Degree Requirements

The College of Agriculture, Food and Natural Resources (CAFNR) B.S. degree requirements, including University general education and graduation requirements, are outlined below. Refer to degree program sections for additional course requirements and minimum credit requirements. (See the School of Natural Resources for degree requirements for Fisheries and Wildlife Sciences; Forestry; and Soil, Environmental and Atmospheric Sciences.)

### General education and CAFNR requirements

<b>Communications</b>	<b>9</b>
ENGLISH 1000 Exposition and Argumentation (a grade of C- or better is required)	3
COMMUN 1200 Public Speaking	3
or AG_ED 2220 Verbal Communication in Agriculture, Food and Natural Resources	
Communication Elective (selected from)	3
AG_ED 2220 Verbal Communication in Agriculture, Food and Natural Resources	
COMMUN 1200 Public Speaking	
COMMUN 3441 Nonverbal Communication	
COMMUN 3572 Argument and Advocacy	
COMMUN 3575 Business and Professional Communication	
C_S_D 1100 American Sign Language I	

ENGLISH 2010 Intermediate Composition	
ENGLISH 2030 Professional Writing	
IS_LT 4360 Introduction to Web Development	
RU_SOC 2225 Science, Technology and Society	
SCI_AG_J 2210 Communicating Science to the Public	
SCI_AG_J 3210 Fundamentals of Communications	
SCI_AG_J 3240 Communicating on the Web	
THEATR 1400 Acting for Non-Majors	
Foreign language	
<b>College algebra</b>	<b>3</b>
MATH 1100 College Algebra (or higher level mathematics course. C- or better required.)	3
<b>Biological, physical, and/or mathematical sciences</b>	<b>11</b>
CHEM 1100 Atoms and Molecules with Lab	3-4
or CHEM 1320 College Chemistry I	
Select one of the following:	3
BIO_SC 1010 General Principles and Concepts of Biology	5
& BIO_SC 1020 and General Biology Laboratory	
or BIO_SC 1030 General Principles and Concepts of Biology with Laboratory	
or BIO_SC 1200 General Botany with Laboratory	
or BIO_SC 1500 Introduction to Biological Systems with Laboratory	
Biological/physical/mathematical science elective: Courses designated BIO, PHYS, or MATH on approved Distribution of Content course list ( <a href="http://generaleducation.missouri.edu/courses/">http://generaleducation.missouri.edu/courses/</a> )	3
<b>Social and behavioral sciences</b>	<b>9</b>
AG_EC 1041 Applied Microeconomics	3
or ECONOM 1014 Principles of Microeconomics	
AG_EC 1042 Applied Macroeconomics	3
or ECONOM 1015 Principles of Macroeconomics	
American History (State Law Requirement) Choose one from:	3
HIST 1100 Survey of American History to 1865	
HIST 1200 Survey of American History Since 1865	
HIST 2210 Twentieth Century America	
HIST 2440 History of Missouri	
HIST 4000 Age of Jefferson	
HIST 4220 U.S. Society Between the Wars 1918-1945	
HIST 4230 Our Times: United States Since 1945	
POL_SC 1100 American Government	
POL_SC 2100 State Government	
<b>Humanities and/or fine arts</b>	<b>6</b>
In addition to AG_ED 2220 or COMMUN 1200 Courses designated HFA on approved Distribution of Content course list ( <a href="http://generaleducation.missouri.edu/courses/">http://generaleducation.missouri.edu/courses/</a> )	
<b>Additional general education requirements</b>	



Writing Intensive (WI) course (grade of C- or better required)  
Math Reasoning Proficiency (MP) (grade of C- or better required)

## Additional University graduation and CAFNR Requirements

- Writing Intensive course in the major at the 3000/4000 level (grade of C- or better required)
- Capstone Course (grade of C- or better required)
- A total of 120 credits are required to earn a Bachelor of Science degree in CAFNR. A minimum of 24 credits in 2000-level or above courses; and an additional 24 credits in 3000-level or above courses are required
- Degree program requirements and course total credits vary. Refer to specific CAFNR degree programs to determine the number of credits required for degree completion
- Must complete a minimum of 32 credits in the disciplines within the College of Agriculture, Food and Natural Resources. A minimum of the 20 credits must be MU course work
- Complete 30 of the last 36 hours with MU course work. Obtain approval of faculty advisor, degree program advisor chair, and associate dean prior to enrolling in courses at another institution
- Earn no less than a 2.00 GPA, as defined by the GPA of Record (UM cumulative GPA)

### Transfer Credits

- A maximum of 18 credit hours of course work in CAFNR disciplines may be transferred from a community college and applied toward departmental degree requirements. Additional credit hours may be applied toward general education requirements or electives
- University general education requirements are considered completed for students transferring with an Associate of Arts (AA) degree from a regionally accredited Missouri institution
- Transfer credit from a regionally accredited non-Missouri institution will be evaluated on a course by course basis

## CAFNR Honors Requirements

Students are eligible to enter the honors program when they have obtained a cumulative GPA of 3.3 or above based on 30 credits earned at the University of Missouri. Transfer students are eligible after completing 15 credits at MU with a cumulative GPA of 3.3 or higher.

Students must be admitted to the honors program prior to the first day of classes for the last semester they are enrolled in residence in CAFNR. No student is admitted retroactively. The student is officially admitted to the program upon approval of the associate dean.

Eligible students should complete an application as early in their undergraduate degree program as possible. The honors program application should be signed by at least two faculty members and the undergraduate advisor chair before it can be approved. The faculty members co-signing the application will comprise the honor student's advisory committee.

An honors project (HP) is required and should be planned by the student and approved by the honor student's advisory committee. The honors project should involve a significant research effort by the honors student, culminating in a written and oral presentation of the results. Departmental

HP requirements must be approved by the CAFNR Honors Program Oversight Committee.

Students are officially admitted to the CAFNR Honors Program when the application has been approved and signed by the CAFNR associate dean of academic programs. To remain in good standing in the CAFNR Honors Program, a student must maintain a cumulative GPA of 3.3 or more. A student whose GPA falls below 3.3 will be allowed a two-semester grace period to raise the GPA to the 3.3 level.

Changes in the program of study must be signed by the student, each advisory committee member, the undergraduate advisor chair and associate dean before they are officially approved.

## Dual Enrollment for Senior Undergraduates

Qualified undergraduate students are eligible to enroll in up to 12 hours of graduate credit during the last 30 hours of their undergraduate program. Graduate credit cannot be counted toward undergraduate degree credit requirements. See Graduate School section of the catalog for additional details.

## Probation, Suspension and Dismissal

In addition to the Academic Standing Policy (p. 660) of the University, CAFNR's academic policies can be located at <http://CAFNR.missouri.edu>.

## Advising

When entering the college, each student is assigned a faculty advisor to assist in defining career goals and planning courses for a program of study that leads to graduation. The faculty advisor also serves as a resource person for the student in a variety of academic and individual situations.

One of a student's first priorities is to meet and become acquainted with the faculty advisor early in the semester. The student should consult with the faculty advisor when planning or changing the academic program. The advisor and advisor chair must approve the program of study for graduation.

Questions dealing with advisement should be directed to Office of Academic Programs, Dickinson Student Achievement Center, 2-64 Agriculture Building, (573) 882-8301.

## Career Services and Professional Opportunities

Graduates find rewarding careers in private industry and with state and federal agencies. Many own their own businesses. Some graduates enter production agriculture while many others enter professions that develop, support or market various products and technologies.

The CAFNR Career Services Office provides students with current information on career areas that are expanding and offer outstanding potential. The staff helps students analyze their skills and encourages them to explore employment opportunities in a variety of career areas. Career development services include career days, one-on-one help sessions, workshops, resumé writing, mock interviews, job-seeking

tactics, and an online job and employer database (HireMizzouTigers.com (<http://HireMizzouTigers.com>))

Each year, the Career Services Office schedules on-campus interviews for graduating seniors and intern candidates to enable representatives from local and national businesses and state and national government agencies to meet prospective employees. The office also assists alumni involved in career changes and undergraduates looking for part-time and summer employment.

For more information, write or call the Career Services Office, Dickinson Student Achievement Center, 2-64 Agriculture Building, (573) 882-0088 or [CAFNRcareerservices@missouri.edu](mailto:CAFNRcareerservices@missouri.edu).

## On-Campus Internships

On-campus internships provide students with professional growth experiences and close associations with faculty members as they work together on projects approved by an internship selection committee. Students can increase their communication skills, problem-solving abilities and technical expertise through an individualized internship experience that takes place on campus. Students complete regular course work in addition to participation in the internship. Students may receive a stipend.

## Internships

To gain relevant career experience, most CAFNR students participate in internship programs. Students intern with government agencies, employers or organizations that furnish facilities and instruction to increase knowledge and strengthen leadership and communication skills.

Academic credit may be given for an internship. Students eligible for internship credit through a CAFNR department must be in good academic standing in a degree program with adequate prerequisite qualifications. For more information on internships, write or call the Career Services Office, 2-64 Agriculture Building, (573) 882-0088 or [CAFNRcareerservices@missouri.edu](mailto:CAFNRcareerservices@missouri.edu).

## Study Abroad

CAFNR provides students with opportunities to study abroad on academic year, semester, summer, short term and winter break programs. Study Abroad compliments and enhances a student's academic program. On these programs, students gain maturity and self confidence, broaden their horizons to the larger world around them and earn academic credit. Increasingly, employers are looking for students who have increased their skill set through study abroad.

For more information about CAFNR study abroad programs, contact the Study Abroad Office, Dickinson Student Achievement Center, 2-64 Agriculture Building, at (573) 882-8301.

## Student Activities

CAFNR offers a variety of extracurricular student activities that contribute to a student's education and professional development. Clubs and organizations sponsor activities related to professional interests as well as social events. Involvement in extracurricular activities fosters leadership development. Involvement in activities outside the classroom also may prove beneficial when applying for scholarships or jobs. Many

organizations and companies look favorably on a student who has received good grades while being involved in clubs and other University organizations. Each class and club elects a representative to the CAFNR Student Council. More information can also be found at Fall Round-up each fall semester.

## Graduate

Graduate studies in CAFNR are taking an innovative, high-tech approach to traditional agriculture, food and natural resources. Our students are highly engaged with expert faculty mentors who are impacting the future with findings on health breakthroughs, sustainable agriculture techniques and food safety. Prospective students are able to choose from a range of academic programs consistently recognized for excellence:

- Agricultural Economics
- Agricultural Education
- Animal Sciences
- Biochemistry
- Biological Engineering
- Fisheries and Wildlife
- Food Science
- Forestry
- Parks, Recreation and Tourism
- Plant Sciences
  - Crop, Soil and Pest Management
  - Entomology
  - Horticulture
  - Plant Breeding, Genetics, and Genomics
  - Plant Stress Biology
- Rural Sociology
- Soil, Atmospheric and Environmental Science

Find CAFNR degree program descriptions by following the links in the left navigation column.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Agribusiness Management

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 Agricultural and Applied Economics  
 College of Agriculture, Food and Natural Resources  
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 ParcellJ@missouri.edu

The Department of Agricultural and Applied Economics offers a BS degree with a major in Agribusiness Management and BS, MS and PhD degrees with a major in Agricultural Economics. A minor in Agricultural Economics is also available. The Department is home to several programs and research centers where students can seek on-campus work experience.

- Agricultural Electronic Bulletin Board, a web-based clearinghouse for information related to farming and production agriculture
- Agribusiness Research Institute, an agribusiness research program that focuses on interactive problem solving and learning
- Center for Applied Research and Environmental Systems, a spatial economics and information research and education center
- Commercial Agriculture Program, a multi-disciplinary approach to researching issues and incorporating innovation into production agriculture
- Community Policy Analysis Center, providing research, outreach and training that supports improved policy decisions in Missouri communities
- Contracting and Organizations Research Institute, dedicated to enabling and encouraging interdisciplinary empirical research on contracting and organizational structure
- Economics and Management of Agrobiotechnology Center, a research institute with a focus on applications of biotechnology on agriculture and food production and distribution
- Food and Agricultural Policy Research Institute, a Congressionally-enacted center whose mission is to provide objective analysis of food, agricultural, nutritional and environmental issues
- McQuinn Center for Entrepreneurial Leadership, promotes research, teaching, and outreach on the nature, causes, and consequences of entrepreneurship.
- Missouri Institute of Cooperatives, coordinates information and leadership training for cooperatives serving Missouri
- Value Added Center, provides industry analysis for producer groups looking to add value to commodities

### Faculty

**Professor Emeritus** M. Bennett, M. Blase, C. Braschler, M. E. Bredahl, T. Brown, G. Devino, G. A. Grimes, C. Headley, N. A. Hein, J. E. Ikerd, V. Jacobs, S. F. Matthews, D. D. Osborn, A. A. Prato, V. J. Rhodes, K. Schneeberger, D. L. VanDyne, P. F. Warnken, A. W. Womack\*\*

**Professor** M. L. Cook\*\*, B. J. Deaton\*\*, J. Findeis\*\*, T. Johnson\*\*, N. Kalaitzandonakes\*\*, W. H. Meyers\*\*, J. Parcell\*\*, R. Plain\*, J. I. Stallman\*, R. E. Westgren\*\*, P. Westhoff\*\*, H. Williamson Jr.\*

**Associate Professor** H. S. James\*\*, M. S. Kaylen\*, P. G. Klein\*\*, L. M. J. McCann\*\*, M. J. Monson\*, K. C. Moore\*, M. E. Sykuta\*\*, W. Thompson, C. B. Valdivia\*\*

**Assistant Professor** F. Chaddad\*\*

**Extension Professor** R. Massey\*\*

**Extension Associate Professor** V. Pierce\*

**Teaching Professor** J. L. Dauve\*

**Assistant Teaching Professor** C. R. Boessen\*

**Research Assistant Professor** J. Binfield, D. S. Brown\*\*

**Instructor** M. Rodriguez Alcala, L. F. Sowers

**Adjunct Faculty** J. Kruse, S. Meyer, D. Miller

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 35)
- BS in Agribusiness Management (p. 36)

The degree in agribusiness management offers the student a general business background while emphasizing applications to various types of food and agricultural businesses. This program prepares students to assume leadership roles in business. The broad background allows maximum flexibility when entering the job market.

### Graduate

While MU does not offer graduate degrees specifically in agribusiness management, the University does offer post-baccalaureate opportunities in a number of related areas, both within the College of Agriculture, Food and Natural Resources, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Courses

Courses for the agribusiness management program are pulled from other academic areas, including Agricultural Economics (p. 702). A cumulative list of all MU courses (p. 697) is also available.

## Undergraduate

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### Department Level Requirements - Agribusiness Management

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Core requirements of the Department must be completed in addition to all major, degree, CAFNR and University graduation requirements, including the University general education requirements (p. 18). The following courses are required by the Department of Agricultural and Applied Economics for both agribusiness management and agricultural economics majors:

Department core requirements		18
AG_EC 1041	Applied Microeconomics	3
AG_EC 1042	Applied Macroeconomics	3
AG_EC 2123	Quantitative Applications in Agricultural Economics	3
AG_EC 2183	The Agricultural Marketing System	3

AG_EC 2225	Statistical Analysis	3
or STAT 2500	Introduction to Probability and Statistics I	
AG_EC 3251	Agricultural Prices	3
AG_EC 3282	Agribusiness Finance	3
<b>Supporting courses</b>		<b>24</b>
AFNR 1120	Computing and Information Technology	2
AFNR 2120	Working with Data Using Excel	1
or ACCTCY 2258	Computer-Based Data Systems	
MATH 1400	Calculus for Social and Life Sciences I	3
ACCTCY 2036	Accounting I	3
or ACCTCY 2136H	Honors Accounting I	
ACCTCY 2037	Accounting II	3
or ACCTCY 2137H	Honors Accounting II	
ECONOM 3229	Money, Banking and Financial Markets	3
<b>Production Agricultural Electives</b>		<b>6</b>
Courses in biological engineering; agricultural systems management; animal sciences; fisheries and wildlife; food science; forestry; natural resources; plant science; soil and atmospheric science; and biochemistry		
<b>Electives</b>		<b>19-22</b>

## BS in Agribusiness Management

### Major Program Requirements

Students transferring into agribusiness management from other departments at MU or from other colleges must have a 2.7 cumulative GPA for all work attempted.

Core Department Level Requirements (p. 35) must be completed in addition to all major, degree, CAFNR and University graduation requirements, including the University general education requirements (p. 18).

The following courses are required for the Agribusiness Management major.

#### Major core requirements

AG_EC 3256	Agribusiness and Biotechnology Law	3
AG_EC 3286	Economics of Managerial Decision Making	3
AG_EC 4971	Agribusiness Management Strategy	3
AG_EC 4972	Agri-Food Business and Cooperative Management	3

#### Business Electives 12

AG_EC 2223	Agricultural Sales	
AG_EC 3150	International Agribusiness	
AG_EC 3224	New Products Marketing	
AG_EC 3230	Agricultural and Rural Economic Policy	
AG_EC 3283	Fundamentals of Entrepreneurship	
AG_EC 3294	Agricultural Marketing and Procurement	
AG_EC 4295	Agricultural Risk Management	

Students may select, business courses 3000+

ACCTCY 2258	Computer-Based Data Systems (with permission and business courses 3000+)	3
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#### Production Agricultural Elective 3

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
AG_EC 1010	1	AG_EC 1011	1		
AG_EC 1041	3	AG_EC 1042	3		
MATH 1100	3	MATH 1400	3		
POL_SC 1100, HIST 1100, or HIST 1200	3	CHEM 1100	3		
AFNR 1120	2	BIO_SC 1010	3		
AFNR 2120	1	BIO_SC 1020	2		
ENGLISH 1000	3				
	<b>16</b>		<b>15</b>		
Second Year					
Fall	Credits	Spring	Credits		
COMMUN 1200 or AG_ED 2220	3	AG_EC 2225	3		
AG_EC 2123	3	AG_EC 3256	3		
ACCTCY 2036	3	ACCTCY 2037	3		
AG_EC 2183	3	Humanities Elective	3		
Production Ag Elective	3	Production Ag Elective	3		
	<b>15</b>		<b>15</b>		
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
AG_EC 3251	3	AG_EC 3286	3	AG_EC 4940	3
AG_EC 3282	3	ECONOM 3229	3		
Communications Elective	3	Business Elective	3		
Business Elective	3	Production Ag Elective	3		
Humanities Elective	3	Free Electives	3		
	<b>15</b>		<b>15</b>		<b>3</b>
Fourth Year					
Fall	Credits	Spring	Credits		
AG_EC 4971	3	AG_EC 4972	3		
Business Elective	6	Free Electives	9		

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Other Electives	6		
	15		12
Total Credits: 121			

## Agricultural Economics

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Joe Parcell, Chair

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<http://dass.missouri.edu/agecon/>

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- McQuinn Center for Entrepreneurial Leadership, promotes research, teaching, and outreach on the nature, causes, and consequences of entrepreneurship
- Missouri Institute of Cooperatives, coordinates information and leadership training for cooperatives in Missouri
- Value Added Center, provides industry analysis for producer groups looking to add value to commodities

### Faculty

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**Professor** M. L. Cook\*\*, B. J. Deaton\*\*, J. Findeis\*\*, T. Johnson\*\*, N. Kalaitzandonakes\*\*, W. H. Meyers\*\*, J. Parcell\*\*, R. Plain\*\*, J. I. Stallman\*, R. E. Westgren\*\*, P. Westhoff\*\*, H. Williamson Jr.\*

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**Adjunct Faculty** J. Kruse, S. Meyer, D. Miller

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 39)
- BS in Agricultural Economics (p. 39)
  - with optional emphasis in Public Policy (p. 39)
  - with optional emphasis in Financial Planning (p. 40)
- Minor in Agricultural Economics (p. 40)

Programs in agricultural economics focus on understanding and solving problems in the production, distribution and use of agricultural goods, services and natural resources. The focus is on courses in management, marketing and production, as well as on courses covering economic principles and computer skills.

Substantial career opportunities exist in food processing and manufacturing, international production, development and trade, biotechnology, agricultural and natural resource management, risk management and merchandising, as well as aspects of agribusiness.

### Graduate

Department of Agricultural Economics  
214 Mumford Hall; Columbia, MO 65211  
573-882-3747  
<http://dass.missouri.edu/agecon/>

**Director of Graduate Studies:** Harvey James, Jr.

- MS in Agricultural Economics (p. 41)
- PhD in Agricultural Economics (p. 41)

### About Agricultural Economics Graduate Programs

A leader in the application of new institutional and welfare economics to agriculture, development, and policy analysis, the Department of Agricultural and Applied Economics at the University of Missouri is recognized for its innovative approach to graduate training in agricultural economics.

A PhD or MS degree in agricultural economics prepares students for a rewarding career in academia, agricultural business, government or international agriculture. Students can study agribusiness management, contracting and strategy; collective action and cooperative theory; econometrics and price analysis; entrepreneurship; environmental and natural resource economics; food, biofuel and agricultural policy and regulation; international development; regional economics and rural development policy; science policy and innovation; sustainable

agriculture and applied ethics. The MS program may be a step toward the PhD but may also be used as a terminal program for those interested in careers in agribusiness, extension or government. Programs are flexible. All PhD and most MS students become involved in research, but those whose career interests lie in other directions find the department willing to accommodate them.

## Internal Funding

A 3.25 GPA (A=4.0) is generally a minimum requirement for financial assistance such as fellowships and assistantships for research and teaching. Reasons for supporting a student with a GPA below 3.25 must be documented in detail.

## Undergraduate

### Department Level Requirements - Agricultural Economics

Core department requirements must be completed in addition to all major, degree, CAFNR and University graduation requirements, including the University general education requirements. The following courses are required for both agribusiness management and agricultural economics majors:

<b>Department core requirements</b>		18
AG_EC 1041	Applied Microeconomics	3
AG_EC 1042	Applied Macroeconomics	3
AG_EC 2123	Quantitative Applications in Agricultural Economics	3
AG_EC 2183	The Agricultural Marketing System	3
AG_EC 2225	Statistical Analysis	3
or STAT 2500	Introduction to Probability and Statistics I	
AG_EC 3251	Agricultural Prices	3
AG_EC 3282	Agribusiness Finance	3
<b>Supporting courses</b>		24
AFNR 1120	Computing and Information Technology	2
AFNR 2120	Working with Data Using Excel	1
or ACCTCY 2258	Computer-Based Data Systems	
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ACCTCY 2036	Accounting I	3
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ACCTCY 2037	Accounting II	3
or ACCTCY 2137H	Honors Accounting II	
ECONOM 3229	Money, Banking and Financial Markets	3
<b>Production Agricultural Electives</b>		6
Courses in biological engineering; agricultural systems management; animal sciences; fisheries and wildlife; food science; forestry; natural resources; plant science; soil and atmospheric science; and biochemistry		
<b>Electives</b>		19-22

## BS in Agricultural Economics

### Major Program Requirements

Students transferring into agricultural economics from other departments at MU or from other colleges or universities must have a 2.7 cumulative GPA for all work attempted.

Core Department Level Requirements (p. 39) must be completed in addition to all major, degree, CAFNR and University graduation requirements, including the University general education requirements (p. 18).

### Options and Tracks

The Agricultural Economics degree offers 1 option. (Note: Options and Tracks are not listed on transcripts or diplomas.)

### Farm and Ranch Professional Option

In addition to the course requirements for CAFNR, the following courses are required within this option:

<b>Option core requirements</b>		12
AG_EC 3257	Rural and Agricultural Law	3
AG_EC 3260	General Farm Management	3
AG_EC 3294	Agricultural Marketing and Procurement	3
AG_EC 4962	Planning the Farm Business	3
<b>Agricultural production</b>		9
Courses in biological engineering; agricultural systems management; animal sciences; fisheries and wildlife; food science; forestry; natural resources; plant science; soil and atmospheric science; and biochemistry		
<b>Business Electives</b>		6
AG_EC 2223	Agricultural Sales	
AG_EC 3150	International Agribusiness	
AG_EC 3224	New Products Marketing	
AG_EC 3230	Agricultural and Rural Economic Policy	
AG_EC 3283	Fundamentals of Entrepreneurship	
AG_EC 3286	Economics of Managerial Decision Making	
AG_EC 4295	Agricultural Risk Management	
AG_EC 4972	Agri-Food Business and Cooperative Management	
students may select ACCTCY 2258 and business courses 3000+		

### Semester Plan

See the semester plans within the emphasis area of Public Policy (p. 39).

## BS in Agricultural Economics with Emphasis in Public Policy

### Major Program Requirements

In addition to the Department Level Requirements (p. 39) for the College of Agriculture, Food and Natural Resources and the Department of Agricultural and Applied Economics, the following courses are required within this emphasis:

<b>Emphasis core requirements</b>	<b>24</b>
AG_EC 2070 Environmental Economics and Policy	3
AG_EC 3230 Agricultural and Rural Economic Policy	3
AG_EC 3271 International Agricultural Development or AG_EC 3272 International Food Trade and Policy	3
AG_EC 4990 Agricultural Economics Capstone Seminar	3
ECONOM 4351 Intermediate Microeconomics	3
Public Policy Electives	9
Production Agricultural Electives	3

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
AG_EC 1010	1	AG_EC 1011	1		
AG_EC 1041	3	AG_EC 1042	3		
MATH 1100	3	MATH 1400	3		
HIST 1100, 1200, POL_SC 1100, or POL_SC 2100	3	BIO_SC 1010	3		
AFNR 1120	2	BIO_SC 1020	2		
AFNR 2120	1	Production Ag Elective	3		
ENGLISH 1000	3				
	<b>16</b>		<b>15</b>		
Second Year					
Fall	Credits	Spring	Credits		
AG_EC 2183	3	COMMUN 1200 or AG_ED 2220	3		
AG_EC 2225	3	AG_EC 2123	3		
ACCTCY 2036	3	AG_EC 2070	3		
CHEM 1100	3	AG_EC 3230	3		
Humanities Elective	3	ACCTCY 2037	3		
	<b>15</b>		<b>15</b>		
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
AG_EC 3251	3	AG_EC 3282	3	AG_EC 4940	3
AG_EC 3271 or 3272	3	Communication Elective	3		
ECONOM 3229	3	Production Ag Elective	3		
ECONOM 4351	3	Public Policy Elective	3		

Production Ag Elective	3	Humanities Elective	3		
	<b>15</b>		<b>15</b>		
<b>Fourth Year</b>					
Fall	Credits	Spring	Credits		
Public Policy Electives	6	AG_EC 4990	3		
Free Electives	9	Free Electives	6		
		Public Policy Electives	3		
	<b>15</b>		<b>12</b>		
Total Credits: 121					

## BS in Agricultural Economics with emphasis in Financial Planning

### Major Program Requirements

The Financial Planning emphasis area prepares undergraduates with the tools necessary for placement in the agricultural finance sector with an emphasis on family financial planning. In addition to the Department Level Requirements (p. 39) for the College of Agriculture, Food and Natural Resources and the Department of Agricultural and Applied Economics, the following courses are required within this emphasis:

<b>Emphasis core requirements</b>	<b>28</b>
AG_EC 3256 Agribusiness and Biotechnology Law	3
ACCTCY 4353 Introduction to Taxation or FINPLN 4187 Tax Planning	3
FINPLN 2083 Financial Planning Careers	1
FINPLN 2183 Personal and Family Finance	3
FINPLN 3283 Financial Planning: Computer Applications	3
FINPLN 4382 Financial Planning: Risk Management	3
FINPLN 4383 Financial Planning: Investment Management	3
FINPLN 4386 Financial Planning: Employee Benefits and Retirement Planning	3
FINPLN 4393 Financial Planning: Estate and Gift Planning	3
FINPLN 4380 Assessing the American Dream or FINPLN 4389 Financial Planning: Case Analysis	3

### Semester Plan

See the semester plans within the emphasis area of Public Policy (p. 39).

## Minor in Agricultural Economics

A minor in agricultural economics requires 18 credits in agricultural economics with at least 9 credits at the 3000 level or above. A student earning an agribusiness management major is not eligible for an agricultural economics minor.

## Graduate



## MS in Agricultural Economics

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Admission Contact Information  
Jody Pestle (pestlej@missouri.edu)  
200 Mumford Hall; Columbia, MO 65211  
573-882-3747

### Admission Criteria

Fall deadline: February 15  
Spring deadline: September 15

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Agricultural Economics Program:*

- Departmental Application (PDF)
- 3 letters of recommendation (PDF)
- Statement of purpose
- GRE score report

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Prerequisites

Before admission to the MS program, a student should have completed at least nine hours of agricultural economics or economics, a course in calculus and one in statistics.

### Graduation Requirements

For the MS degree, students must complete a minimum of 30 hours selected from courses accepted for graduate credit. The program must include graduate-level courses in intermediate microeconomic theory, intermediate macroeconomic theory, and multiple regression analysis. Students opting for the MS thesis must also complete at least six credit hours of research as part of the minimum 30 hours. An alternative MS non-thesis program requires that some additional course work be substituted for thesis research.

### For More Information

For further information on admissions or financial assistance, write to Harvey James, director of graduate studies in agricultural economics, 200 Mumford Hall, Columbia, MO 65211, or h james@missouri.edu.

## PhD in Agricultural Economics

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Admission Contact Information  
Jody Pestle (pestlej@missouri.edu)  
200 Mumford Hall; Columbia, MO 65211  
573-882-3747

## Admission Criteria

Fall deadline: February 15  
Spring deadline: September 15

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Agricultural Economics Program:*

- Departmental Application (PDF)
- 3 letters of recommendation (PDF)
- Statement of purpose
- GRE score report

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Prerequisites

Prerequisites for the PhD program include courses in intermediate microeconomics; intermediate macroeconomics; quantitative or mathematical economics; statistics, econometrics or regression and correlation analysis; and calculus. A master's degree in economics, agricultural economics, or a related field, is preferred but not required for admittance into the PhD program. However, applicants to the PhD program without a master's degree will be admitted initially into the master's program with the expectation that they complete the MS degree including MS thesis before continuing with their doctoral studies.

### Graduation Requirements

The size, quality and diversity of the faculty provide a broad choice of advisers and research topics. Students may specialize in agribusiness management; resources and development; or markets, trade and policy analysis. The student and the doctoral advisory committee have considerable latitude in developing a plan of study. There is no foreign language requirement. The general course requirements for the PhD consist of courses in advanced microeconomic theory, new institutional economics, welfare economics, econometrics and research methodology, followed by a well-balanced selection of elective and research courses in agricultural economics and other disciplines at the 8000/9000 level. The course of study should prepare the student for the written qualifying exam taken after the first year of courses, the comprehensive exam assessing the student's competency in his or her chosen fields of study, and independent research. A dissertation embodying the results of original research must be written on a subject approved by the program committee. An oral examination over the dissertation completes the degree requirements.

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## **For More Information**

For further information on admissions or financial assistance, write to Harvey James, director of graduate studies in agricultural economics, 200 Mumford Hall, Columbia, MO 65211, or [hjames@missouri.edu](mailto:hjames@missouri.edu).

## Agricultural Education and Leadership

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Anna L. Ball, Associate Professor and Chair  
College of Agriculture, Food and Natural Resources  
127 Gentry Hall  
(573) 882-7451  
Fax: (573) 884-4444

Administrative assistant: swaimc@missouri.edu  
<http://aged.missouri.edu>

The agricultural education degree program provides students with the opportunity to combine an interest in agriculture, food and natural resources with their enjoyment of working and communicating with people. A degree in agricultural education leads to careers in which students can influence the understanding of agriculture and its role in society and the global economy.

The department offers the BS with a major in Agricultural Education, as well as an MS and a PhD. A minor is also available.

### Faculty

**Professor** B. L. Garton\*\*, L. G. Schumacher\*\*

**Associate Professor** A. L. Ball\*\*, T. J. Kitchel\*\*

**Assistant Professor** J. C. Simonsen\*\*

**Instructor** J. D. Tummons\*

**Specialist** R. Scheiderer

**Professor Emeritus** R. E. Linhardt, B. R. Stewart

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 43)
- BS in Agricultural Education (p. 43)
  - with emphasis in Leadership (p. 44)
  - with emphasis in Teacher Certification (p. 45)
- Minor in Agricultural Education (p. 46)

Students pursuing a degree in agricultural education choose between two emphasis areas. The leadership emphasis focuses on developing students' leadership, communication and human relation skills. Students learn how to plan, manage and disseminate information in educational and public settings. Teacher certification emphasis prepares students to meet state teacher licensure requirements and teach agriculture, food and natural resources to secondary and adult learners through Missouri public schools. Students in both the teacher certification and leadership emphasis areas have the opportunity to specialize in an area of interest by completing course work in one or more agriculture, food or natural resource disciplines.

Students transferring into agricultural education from academic degree programs within the University of Missouri must have at least a 2.3 GPA for all course work attempted.

### Graduate

Department of Agricultural Education and Leadership  
121 Gentry Hall, Columbia, MO 65211  
573-882-7451  
<http://dass.missouri.edu/aged/grad/>

**Director of Graduate Studies:** Tracy Kitchel

- MS in Agricultural Education (p. 46)
- PhD in Agricultural Education (p. 46)

The agricultural education programs are designed for students with interests in agricultural education and leadership development. Coursework includes program and professional development, evaluation, teaching and learning theories and practices, social sciences research methods, organization and administration, leadership and communication.

### Undergraduate

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## Department Level Requirements - Agricultural Education

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The Department of Agricultural Education does not have any specific degree requirements over and above those set for the major. Please see the BS in Agricultural Education (p. 43) page for the major program requirements.

### Major Core Requirements

See university general education and graduation requirements as well as the College of Agriculture, Food and Natural Resources listings. The requirements specific to agricultural education are also available at <http://aged.missouri.edu>.

### Emphasis Areas

Students majoring in the agricultural education select the Teacher Certification emphasis or Leadership emphasis.

## BS in Agricultural Education

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### Major Program Requirements

Students must complete the University of Missouri's general education requirements (p. 18) in addition to the Major Program Requirements below to earn the Bachelor of Science degree. Approximately one-third of the course work for the degree is completed in agricultural education or professionally related courses. In addition, the curriculum includes courses in agriculture, food and natural resource disciplines including agricultural economics, agricultural systems management, animal science, food science, horticulture, plant science and natural resources.

Students majoring in agricultural education select the Teacher Certification emphasis or Leadership emphasis. Please see the individual emphasis areas for degree requirements.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
AG_ED 1000 <sup>^</sup>	1	COMMUN 1200 <sup>*</sup>	3
ENGLISH 1000 <sup>*</sup>	3	MATH 1100 <sup>*</sup>	3
HIST 1100 <sup>*</sup>	3	AG_EC 1042 <sup>*</sup>	3
AG_EC 1041 <sup>*</sup>	3	BIO_SC 1010 <sup>*</sup>	3
AN_SCI 2165 <sup>^</sup>	3	BIO_SC 1020 <sup>*</sup>	2
F_S 2114	3		
	16		14
Second Year			
Fall	Credits	Spring	Credits
AG_ED 2250 <sup>^</sup>	3	LTC 2040	3
ESC_PS 2010	3	LTC 2044	1
ESC_PS 2014	1	CHEM 1100 <sup>*</sup>	3
AG_S_M 1020 <sup>^</sup>	3	AN_SCI 2175 <sup>^</sup>	3
THEATR 1400 <sup>*</sup>	3	AG_ED 2220 <sup>*</sup>	3
		MUSIC_NM 1311 <sup>*</sup>	3
	13		16
Third Year			
Fall	Credits	Spring	Credits
AG_ED 3310 <sup>^</sup>	2	AG_ED 4320 <sup>^</sup>	3
AG_ED 4310 & AG_ED 4311 <sup>^</sup>	4	AG_ED 4321 <sup>^</sup>	1
PLNT_S 2075 <sup>^</sup>	3	AG_EC 2183 <sup>^</sup>	3
AG_EC 2223	3	SPC_ED 4020	3
PLNT_S 2220	2	STAT 1400 <sup>*</sup>	3
PLNT_S 3220	2	SOIL 2100 <sup>^</sup>	3
	16		16
Fourth Year			
Fall	Credits	Spring	Credits
AG_ED 4330 <sup>^</sup>	3	AG_ED 4087 <sup>^</sup>	3
LTC 4560	2-3	AG_ED 4995 <sup>^</sup>	12
AG_ED 3320 <sup>^</sup>	3		
PLNT_S 3230 <sup>^</sup>	3		
AG_EC 3224 <sup>^</sup>	3		
	14-15		15
Total Credits: 120-121			

\* Denotes University General Education Requirements

<sup>^</sup> Denotes Degree Program Requirements

## BS in Agricultural Education with Emphasis in Leadership

### Major Program Requirements

Students must complete the University of Missouri's general education requirements (p. 18) in addition to the Major Program Requirements below to earn the degree.

### Leadership Emphasis

The leadership emphasis focuses on developing students' leadership, communication and human relation skills. Students are encouraged to develop a diverse background by completing course work in a variety of disciplines in the College of Agriculture, Food and Natural Resources. Students also have the opportunity to specialize and earn minors in disciplines of interest. The capstone experience involves a supervised internship with an agricultural business, public or private agency, or commodity organization in the area of education, training, communication and/or development.

#### Emphasis core requirements

<b>Agricultural Education</b>	20
AG_ED 1000 Orientation to Agricultural Education	1
AG_ED 2220 Verbal Communication in Agriculture, Food and Natural Resources	3
AG_ED 2250 Introduction to Leadership	3
AG_ED 2260 Team and Organizational Leadership	3
AG_ED 4340 Designing and Delivering Nonformal Educational Programs	4
AG_ED 4993 Internship in Agricultural Education	3
Additional AG_ED Leadership Course	3
<b>Additional requirements (minimum 13)</b>	13
PSYCH 1000 General Psychology	
H_D_FS 2400 Principles of Human Development	
ENGLISH 2030 Professional Writing	
SCI_AG_J Fundamentals of Communications 3210	
SCI_AG_J Communicating on the Web 3240	
Diversity Elective (3)	
Focus Area (minimum 9) (as approved by advisor)	9
<b>Agricultural economics</b>	6
Agricultural Economics Elective	3
AG_EC 2223 Agricultural Sales	3
<b>Animal Science</b>	3
Animal Science Elective	3
<b>Plant and Soil Science</b>	3
Plant Science Elective	3
<b>Natural Resources/ Hospitality Management</b>	3
Natural Resources/Hospitality Management Elective	3
<b>Electives</b>	25
CAFNR Electives	18
General Electives	7

## Semester Plan

Refer to the Semester Plan for the BS in Agricultural Education (p. 43).

# BS in Agricultural Education with Emphasis in Teacher Certification

## Major Program Requirements

Students must complete the University of Missouri's general education requirements (p. 18) in addition to the Major Program Requirements below to earn the degree.

## Teacher Certification Emphasis

The Teacher Certification emphasis prepares students to meet state teacher licensure requirements to teach agriculture in Missouri public schools at the secondary and adult levels. In addition to courses in agricultural education, the curriculum includes a diverse selection of courses in agriculture, food and natural resources and professional teacher certification courses offered through the College of Education.

The capstone experience involves a semester-long teaching internship in a selected secondary agriculture program.

<b>Emphasis core requirements</b>	<b>29</b>
AG_ED 1000 Orientation to Agricultural Education	1
AG_ED 3310 Teaching Financial Management and Economics	2
AG_ED 4310 Rationale and Structure of Agricultural Education Programs	3
AG_ED 4311 Integrated Field Experience I	1
AG_ED 4320 Methods of Teaching I	3
AG_ED 4321 Integrated Field Experience II	1
AG_ED 4330 Methods of Teaching II	3
AG_ED 4087 Internship Seminar in Agricultural Education	3
AG_ED 4995 Student Teaching Internship in Agriculture	12
<b>College of Education</b>	<b>13</b>
ESC_PS 2010 Inquiry Into Learning I	3
ESC_PS 2014 Inquiry into Learning I - Field Experience	1
LTC 2040 Inquiring into Schools, Community and Society I	3
LTC 2044 Inquiring into Schools, Community and Society: Field	1
SPC_ED 4020 Inquiry into Learning II	3
LTC 4560 Teaching Reading in the Content Areas	2
<b>Agricultural economics</b>	<b>3</b>
AG_EC 2183 The Agricultural Marketing System	3
or AG_EC 3224 New Products Marketing	
or AG_EC 2223 Agricultural Sales	
<b>Animal Science</b>	<b>9</b>
AN_SCI 2165 Introduction to Ruminant Livestock Production	3
AN_SCI 2175 Introduction to Monogastric Production	3
AN_SCI 2114 Live Animal and Meat Evaluation	3
OR Elective	3
<b>Agronomy</b>	<b>3</b>
PLNT_S 2110 Plant Growth and Culture	3
or SOIL 2100 Introduction to Soils	
or PLNT_S 3275 Grain Crops	

or PLNT_S 3270 Forage Crops	
<b>Leadership</b>	<b>3</b>
AG_ED 2250 Introduction to Leadership	3
or AG_ED 2260 Team and Organizational Leadership	
<b>Agricultural systems management</b>	<b>6</b>
AG_S_M 1020 Introduction to Agricultural Systems Management	3
AG_ED 3320 Metal Fabrication and Laboratory Management	3
<b>Horticulture</b>	<b>6</b>
PLNT_S 2075 Environmental Horticulture	3
OR	
PLNT_S 3230 Plant Propagation	3
OR	
PLNT_S 3260 Greenhouse Management	4
OR	
PLNT_S 2220 Floral Design I & PLNT_S 3220 and Floral Design II	4
OR	
PLNT_S 4365 Greenhouse Crops Production	4
<b>Electives</b>	<b>10</b>
CAFNR electives	3
General Electives	7

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
AG_ED 1000	1	MATH 1100	3
ENGLSH 1000	3	BIO_SC 1010	3
AG_EC 1041	3	BIO_SC 1020	2
AN_SCI 2165	3	AG_EC 1042	3
PLNT_S 2075	3	PLNT_S 2110	3
		Humanistic Studies and/or Fine Arts	3
	<b>13</b>		<b>17</b>
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
AG_ED 2220	3	AN_SCI 2175	3
CHEM 1100	3	FINPLN 2183	3
AG_S_M 1020	3	AG_ED 2250	3
HIST 1100	3	Humanistic Studies and/or Fine Arts	3
	<b>16</b>		<b>16</b>
Third Year			
Fall	Credits	Spring	Credits
AG_ED 4310	3	AG_ED 4320	3
AG_ED 4311	1	AG_ED 4321	1
AG_ED 3310	2	SPC_ED 4020	3

AG_EC 2183	3	AFNR Electives/ Minor Courses	7
F_S 2114	3		
Communications Elective	3		
	15		14
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
AG_ED 4330	3	AG_ED 4087	3
LTC 4560	2	AG_ED 4995	12
AG_ED 3320	3		
PLNT_S 3230	3		
AFNR Elective/ Minor Course	3		
	14		15
Total Credits: 120			

- Official transcripts (mail to the Graduate School; no need to send University of Missouri transcripts)
- Official GRE scores
- Personal data sheet (found at aged.missouri.edu; upload to the Graduate School application website)
- Minimum of 2 letters of recommendation (use Graduate School application website)

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Graduation Requirements

The department offers three MS degree options:

1. Thesis
2. Creative Component
3. Creative Component with Teacher Certification

## Thesis Option

The Thesis option requires a minimum of 30 hours of graduate credit (to include a minimum of 24 hours of formal graduate courses, plus a maximum of six hours of 8090 Research) with a minimum of 15 credit hours at the 8000 level. Candidates must also complete an approved thesis based on original research.

## Creative Component

The Creative Component option requires a minimum of 32 hours of graduate credit (to include a minimum of 29 hours of formal graduate courses, plus a maximum of 3 hours of 8080 Creative Component) with a minimum of 16 credit hours at the 8000 level. Candidates must also complete an approved creative component project.

## Creative Component with Teacher Certification

The Creative Component with Teacher Certification option requires a minimum of 32 hours of graduate credit (to include a minimum of 29 hours of formal graduate courses, plus a maximum of 3 hours of 8080 Creative Component) with a minimum of 16 credit hours at the 8000 level. Candidates must also complete an approved creative component project. Included in the course work for this option are some of the classes needed for certification to teach secondary high school agriculture in Missouri.

## PhD in Agricultural Education

### Admission Contact Information

Dr. Tracy Kitchel (kitcheltj@missouri.edu)  
121 Gentry Hall, Columbia, MO 65211  
573-882-7451

### Admission Criteria

Fall deadline: N/A

- Minimum TOEFL scores:

## Minor in Agricultural Education

The Agricultural Education minor focuses on learning, teaching and the dissemination of information about agriculture, food and natural resource topics. The minor requires 15 credits of agricultural education course work with a minimum of 6 credits at the 3000 level or above.

## Graduate

## MS in Agricultural Education

### Admission Contact Information

Dr. Tracy Kitchel (kitcheltj@missouri.edu)  
121 Gentry Hall, Columbia, MO 65211  
573-882-7451

### Admission Criteria

Fall deadline: July 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Minimum GRE score. GRE scores are only required for applicants having an undergraduate GPA below 3.20 in the last 60 hours of undergraduate course work

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	900	4.0
On or After August 1, 2011	291	4.0

- Minimum GPA: Average of 3.0 in the last 60 hours of undergraduate course work

### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Agricultural Education Program:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	4.0
On or After August 1, 2011	297	4.0

- Minimum GPA: 3.5 on prior graduate course work
- Minimum of 3 years full-time appropriate teaching or other professional experience in elementary, secondary, higher education or industry.
- Correspondence with one of the Agricultural Education faculty members in the proposed area of concentration prior to submitting an application. This contact is ultimately a requirement for admission.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Agricultural Education Program:*

- Résumé (upload to the Graduate School application website)
- Official transcripts (sent to the Graduate School; no need to send University of Missouri transcripts)
- Official GRE scores
- Personal data sheet (found at [aged.missouri.edu](http://aged.missouri.edu); upload to the Graduate School application website)
- Minimum of 3 letters of recommendation (use Graduate School application website)
- Preliminary examination (if necessary)

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Prerequisites

The focus of the doctor of philosophy program is development of professional educators for teacher certification programs in agriculture. To be admitted, applicants must have completed a minimum of three years of professional experience in a field related to agricultural education.

## Agricultural Systems Management

Leon G. Schumacher, Chair  
 College of Agriculture, Food and Natural Resources  
 Division of Food Systems and Bioengineering  
 207 Agricultural Engineering Building  
 (573) 882-2731  
 ASM@missouri.edu

Agricultural systems management integrates physical systems with agricultural science and management skills to provide graduates with abilities to function in sales, service and maintenance management positions in agribusiness industries. The uniqueness of agricultural systems management graduates lies in their knowledge of the principles of physical systems that are the backbone of modern agricultural and food industries. The department offers the Bachelor of Science with a major in Agricultural Systems Management. A minor is also available.

### Faculty

**Professor** D. Brune\*, W. Downs, L. Schumacher\*  
**Associate Professor** D. Baker\*, S. Borgelt\*, K. Sudduth\*\*, A. Thompson\*\*  
**Assistant Professor** B. Broz, B. Koc\*\*, T. Lim\*, J. Zulovich\*  
**Research Associate** K. Funkenbusch  
**Extension Associate** D. Downing  
**Professor Emeritus** D. Currence, J. Frisby, B. Hires, J. Hoehne, D. Pfost

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 48)
- BS in Agricultural Systems Management (p. 48)
- Minor in Agricultural Systems Management (p. 49)

### Graduate

While MU does not offer graduate degrees in ASM, the University does offer post-baccalaureate opportunities in a number of related areas, both within the College of Agriculture, Food and Natural Resources, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options.

## Undergraduate

## Department Level Requirements - Agricultural Systems Management

The Department of Agricultural Systems Management does not have any specific degree requirements over and above those set for the major. Please see the BS in Agricultural Systems Management (p. 48) page for the major program requirements.

## BS in Agricultural Systems Management

### Major Program Requirements

Students must complete the general education requirements (p. 18) in addition to the Major Program requirements below.

<b>Major core requirements</b>	44
<b>Required courses</b>	9
AG_S_M 1020 Introduction to Agricultural Systems Management	3
AG_S_M 1040 Physical Principles for Agricultural Applications	3
AG_S_M 4970 Agricultural Systems Management - Capstone	3
<b>At least three courses from the following</b>	9
AG_S_M 2220 Agricultural/Industrial Structures	
AG_S_M 2360 Fluid Power	
AG_S_M 4020 Agricultural Safety and Health	
AG_S_M 4220 Material Handling and Conditioning	
AG_S_M 4140 Electricity: Wiring and Equipment	
AG_S_M 4320 Agricultural Equipment and Machinery	
<b>At least one course from the following</b>	3
AG_S_M 4420 Surface Water Management	
AG_S_M 4460 Irrigation and Drainage	
<b>Select from the following to accumulate a minimum of 31 hours</b>	31
AG_S_M 2320 Internal Combustion Power	
AG_S_M 2340 Pesticide Application Equipment	
AG_S_M 2345 Chemical Application Systems	
AG_S_M 3350 Problems in Agricultural Systems Management (up to 6)	
AG_S_M 4150 Biorenewable Systems Technology	
AG_S_M 4225 Preservation of Grain Quality	
AG_S_M 4360 Precision Agriculture Science and Technology	
AG_S_M 1002 Topics in Agricultural Systems Management-Biological/Physical/Math	
AG_S_M 1120 Agricultural/Industrial Materials and Processes	
AG_S_M 4120 Advanced Agricultural/Industrial Materials and Processes	
AG_S_M 4350 Problems in Agricultural Systems Management	
AG_S_M 4940 Agricultural Systems Management Internship	
<b>Supporting courses</b>	
PLNT_S 2100 Introduction to Soils	3
or SOIL 2100 Introduction to Soils	
or PLNT_S 2110 Plant Growth and Culture	



or AN_SCI 1065	Animal Science Laboratory Practicum	
AFNR 1120	Computing and Information Technology	1-2
or AFNR 2120	Working with Data Using Excel	

**Business/economics (suggested courses)**

 Select 5 of the following: 15

ACCTCY 2036	Accounting I	
MANGMT 3000	Principles of Management	
AG_EC 2183	The Agricultural Marketing System	
AG_EC 3282	Agribusiness Finance	
or FINANC 1000	Principles of Finance	
AG_EC 3256	Agribusiness and Biotechnology Law	
or AG_EC 3257	Rural and Agricultural Law	
AG_EC 3260	General Farm Management	

**Electives 27**

In consultation with their advisor, students may select elective courses to bring their total credit hours to the 120 hour minimum. Typically electives are chosen to provide emphasis in one of the following areas:

- Natural resource and environment
- Materials handling and crop processing
- Power and machinery systems
- Production agriculture

## Agricultural Equipment Dealership Management Program

Students who participate in the Agriculture Equipment Dealership Management program take a comprehensive sequence of courses in agricultural systems management and agricultural business management. Each student plans and completes an internship with a sponsoring dealer. Up to 6 credits may be earned through an Internship.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	AG_EC 1042	3
BIO_SC 1010	3	ENGLISH 1000	3
BIO_SC 1020	2	AFNR 2120	1
AG_S_M 1020	3	CHEM 1100	3
AG_EC 1041	3	AG_S_M 1040	3
		HIST 1100, 1200, POL_SC 1100, or POL_SC 2100	3
	14		16
Second Year			
Fall	Credits	Spring	Credits
COMMUN 1200	3	AG_S_M 2320	3
AG_S_M 2360	3	AG_S_M 2340	3

BIOCHM 2112	3	SOIL 2100	3
AG_EC 2223	3	STAT 1400	3
Humanistic Studies and/or Fine Arts	3	CAFNR Elective	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
AG_S_M 4140	3	AG_S_M 4220	3
AG_EC 2183	3	AG_S_M 4020	3
FINANC 1000	3	AG_EC 3260	3
SCI_AG_J 3240	3	AG_S_M 4940	3
		Humanistic Studies and/or Fine Arts	3
	12		15
Fourth Year			
Fall	Credits	Spring	Credits
AG_S_M 4970	3	AG_S_M 4360	3
AG_S_M 4320	3	AG_EC 3257	3
ACCTCY 2036	3	AG S M Elective	3
PHIL 1000	3	AG S M Elective	3
AG_EC elective	3	AG S M Elective	3
	15		15
Total Credits: 117			

## Minor in Agricultural Systems Management

15 hours of Agricultural Systems Management coursework. Of the 15 hours, 9 hours must be 3000 level or above.

## Agriculture

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Bryan Garton, Associate Dean, Academic Programs  
Shari Freyeremuth, Assistant Dean, Academic Programs  
Mary Hendrickson, Coordinator Sustainable Agriculture Program

### Faculty

See Listing for Faculty in areas of concentration by referring to the degree listings available under the College of Agriculture, Food and Natural Resources.

### Undergraduate

Dickinson Student Achievement Center  
2-64 Agriculture Building  
(573) 882-8301  
www.cafnr.missouri.edu

- Department Level Requirements (p. 50)
- BS in Agriculture (p. 50)
  - with optional emphasis in Sustainable Agriculture (p. 51)

The agriculture degree program is for students searching for a well-rounded education that builds on the diversity of the other degree programs in the College of Agriculture, Food and Natural Resources (CAFNR). The flexibility of agriculture degree enables students to tailor a program to fit their individual interests and career goals. Students earn a Bachelor of Science in Agriculture.

Students choose agriculture for a variety of reasons. Some may enter the program with a specific career goal in mind. Others may choose agriculture to obtain a broader education that will give them more flexibility.

### Graduate

While the College of Agriculture, Food and Natural Resources does not offer a graduate degree in Agriculture, the College does offer graduate degrees and certificates in a number of disciplinary areas. The catalog provides a complete list of these degree options (p. 5) for all Schools and Colleges that make up the University of Missouri.

## Undergraduate

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### Department Level Requirements - Agriculture

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There are no requirements at the department level for this degree. Please see the BS in Agriculture (p. 50) page for the major program requirements.

## BS in Agriculture

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### Major Program Requirements

To complete the requirements for the Agriculture degree, students must complete the general requirements for the College of Agriculture, Food and Natural Resources, as well as all University graduation requirements,

including University general education requirements (p. 18). These requirements include courses in communications, natural science and math, social science and humanities and business and economics. (See the general requirements for all BS degrees in College of Agriculture, Food and Natural Resources.)

- Students in agriculture also must complete three areas of concentration from CAFNR programs that offer a major or a minor. The primary concentration area requires completion of 18 or more credits. Two additional concentration areas of at least 15 credits each are also required. (See below.)
- These courses shall not be used to fulfill the requirements of a minor.
- Within each concentration area, at least six credits must be at the 3000-level or above.
- Within each concentration area, at least 50 percent of the credits must be earned on the MU campus.
- Credits used to meet the University general education requirements can be used to meet requirements in concentration areas.
- No more than six credits in the primary area and three credits in the secondary areas may consist of problems, readings, internships, travel courses and other non-structured courses.
- The capstone experience for agriculture majors can be a capstone course in a concentration area, an internship or capstone project. This capstone is in addition to credits in the concentration areas.
- Overall, a minimum of 42 credits must be taken in the College of Agriculture, Food and Natural Resources out of the total of 120 credits needed to satisfy degree requirements. A minimum of 24 credits in 2000-level or above; and an additional 24 credits in 3000-level or above courses are required.

### Areas of Concentration

In addition to the University's general education requirements and the graduation requirements of the College of Agriculture, Food and Natural Resources, students must complete at least 18 credits in one of the following areas, and at least 15 credits in two additional areas. These include:

Agricultural Economics  
Agricultural Education  
Agricultural Leadership  
Agricultural Systems Management  
Animal Sciences  
Fisheries and Wildlife Sciences  
Food Science and Nutrition  
Forestry  
Hospitality Management  
Natural Resources  
Parks, Recreation and Tourism  
Plant Sciences  
Rural Sociology  
Science and Agricultural Journalism  
Soil, Environmental, and Atmospheric Sciences

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
AG_EC 1041	3	AG_EC 1042	3		
ENGLISH 1000	3	MATH 1100	3		
RU_SOC 1000	3	BIO_SC 1010	3		
HIST 1100	3	BIO_SC 1020	2		
AFNR 1120	2	Humanities Elective	3		
AFNR 2120	1				
	15		14		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
AG_ED 2220	3	STAT 1200	3	International Studies recommended	
CHEM 1100	3	Communications Elective	3		
Humanities Elective	3	Ag Concentration Area Courses	10		
Ag Concentration Area Courses	6				
	15		16		0
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
BIOCHM 2112	3	Ag Concentration Area Courses	9	Internship Recommended	
Ag Concentration Area Courses	6	Writing Intensive Elective	3		
Other Electives	6	Other Elective	3		
	15		15		0
Fourth Year					
Fall	Credits	Spring	Credits		
Ag Concentration Area Courses	9	Ag Concentration Area Courses	9		
Other Electives	6	Senior Capstone	3		
		Other Elective	3		
	15		15		
Total Credits: 120					

## BS in Agriculture with Emphasis in Sustainable Agriculture

### Major Program Requirements

Department Level Requirements (p. 50)

CAFNR offers an emphasis area in Sustainable Agriculture as part of its Agriculture degree program. A minimum of 48 credits is required for the emphasis area (major) degree.

Primary Concentration		18
AFNR 2215	Introduction to the Theory and Practice of Sustainable Agriculture	3
AFNR 3215	Community Food Systems	3
AFNR 3315	Advanced Practices in Sustainable Agriculture	3
SOIL 2100	Introduction to Soils ((Concurrent enrollment in SOIL 2106 recommended))	3
Choose two courses from the following		
AN_SCI 2111	Sophomore Seminar: Societal Issues Facing Animal Agriculture	3
PLNT_S 2110	Plant Growth and Culture	3
RU_SOC 1120	Population and the Environment	3
NAT_R 1060	Ecology and Conservation of Living Resources	3
NAT_R 1070	Ecology and Renewable Resource Management	3
Secondary Concentration		15
AG_EC 2070	Environmental Economics and Policy	3
AG_EC 2183	The Agricultural Marketing System	3
AG_EC 3241	Ethical Issues in Agriculture	3
Choose one course from the following		
AG_EC 3260	General Farm Management	3
AG_EC 3224	New Products Marketing	3
Choose one course from the following		
RU_SOC 2225	Science, Technology and Society	3
BIOCHM 2112	Biotechnology in Society	3
SCI_AG_J 4414	Field Reporting on the Food System and Environment	3
Secondary Concentration		15
Choose Community Food Systems OR Production Systems		
Community Food Systems (15 hrs total)		
AG_EC 2223	Agricultural Sales	3
AG_EC 3271	International Agricultural Development	3
AG_EC 3283	Fundamentals of Entrepreneurship	3
AG_ED 2250	Introduction to Leadership	3
AG_ED 2260	Team and Organizational Leadership	3
AG_ED 4340	Designing and Delivering Nonformal Educational Programs	4
AN_SCI 2111	Sophomore Seminar: Societal Issues Facing Animal Agriculture	3
FINPLN 2183	Personal and Family Finance	3
HSP_MGMT 1991	Food Service Sanitation Management (and HSP_MGMT 1995)	1
NUTR_S 4590	Community Nutrition	3
RU_SOC 3235	Global Perspectives and Realities	3
RU_SOC 3325	Sociology of Food and Nutrition	3
RU_SOC 4341	Building Communities from the Grassroots	3
RU_SOC 4325	American Community Studies	3
RU_SOC 4370	Environmental Sociology	3
Production Systems (15 hrs total)		
AG_EC 4962	Planning the Farm Business	3

AN_SCI 2111	Sophomore Seminar: Societal Issues Facing Animal Agriculture	3
AN_SCI 2165	Introduction to Ruminant Livestock Production	3
AN_SCI 2175	Introduction to Monogastric Production	3
AN_SCI 3212	Principles of Animal Nutrition	3
FOREST 4385	Agroforestry I: Theory, Practice and Adoption	3
PLNT_S 2075	Environmental Horticulture	3
PLNT_S 2125	Plant Structure and Function	3
PLNT_S 3210	Principles of Weed Science	4
PLNT_S 3230	Plant Propagation	3
PLNT_S 3260	Greenhouse Management	4
PLNT_S 3270	Forage Crops	3
PLNT_S 3275	Grain Crops	3
PLNT_S 3710	Introductory Entomology	3
PLNT_S 3715	Insect Diversity	2
PLNT_S 4730	Insect Pest Management for Plant Protection	3
SOIL 3290	Soils and the Environment	3
SOIL 4308	Soil Conservation	3
SOIL 4312	Environmental Soil Microbiology	3
SOIL 4313	Soil Fertility and Plant Nutrition	3
Total Credits		204

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## Animal Sciences

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Division of Animal Sciences  
College of Agriculture, Food and Natural Resources  
S108 Animal Sciences Center  
(573) 882-8336  
Fax: (573) 882-6827  
<http://animalsciences.missouri.edu>

**Division Director:** Thomas B. McFadden

Animal sciences is a broad field centered on the study of agriculturally important animals and their products. Graduates in animal sciences have employment opportunities in many areas including agribusiness (feed, pharmaceutical and meat industries; dairy and poultry products; public relations and research), production and management (farming/ranching; managers of livestock and poultry operations; zookeepers; consultants and technical service representatives), governmental agencies (USDA and MDA) and educational institutions (extension, teaching and research).

Students seeking admission into graduate and professional schools usually take more courses in the sciences than students in production and management, who select more business-related courses. Students and their faculty advisors select those courses that fit the students' needs, interests and objectives. The most specialization occurs at the graduate level.

The department offers BS, MS and PhD degrees with majors in Animal Sciences. A minor is also available.

## Faculty

**Curators Professor** R. S. Prather\*\*, R. M. Roberts\*\*, J. F. Taylor\*\*  
**Professor** J. D. Firman\*\*, K. Fritsche\*\*, R. D. Geisert\*\*, G. W. Jesse\*, D. H. Keisler\*\*, M. S. Kerley\*\*, W. R. Lamberson\*\*, D. R. Ledoux\*\*, C. Lorenzen\*\*, M. C. Lucy\*\*, T. McFadden\*\*, D. J. Patterson\*\*, R. Prather, R. E. Ricketts\*, R. M. Roberts\*\*, K. Sharpe Timms\*\*, M. F. Smith\*\*, J. N. Spain\*, D. E. Spiers\*\*, J. Taylor\*\*

**Associate Professor** C. Elsik\*\*, J. A. Green\*\*, T. J. Safranski\*\*, M. C. Shannon\*\*, P. Sutovsky\*\*, B. Wiegand\*\*

**Assistant Professor** G. Conant\*\*, R. Rivera\*\*, J. Sexten\*, T. Strauch\*, M. Waldron\*\*, K. Wells\*\*

**Assistant Teaching Professor** T. Strauch Safranski\*

**Assistant Research Professor** R. Schnabel\*\*

**Adjunct Professor** D. Lubahn\*

**Assistant Adjunct Professor** A. Gaines, L. Schulz, A. Wurst

**Instructor** M. Crosby, D. J. Kemp

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 54)
- BS in Animal Sciences (p. 54)
- Minor in Animal Sciences (p. 55)

## Departmental Honors Program

In addition to the guidelines for the honors program in the College of Agriculture, Food and Natural Resources, students must meet the following requirements for the honors program in animal sciences. A student must be a junior or senior to participate in the honors program.

- Successful completion of either an internship or undergraduate research or a combination of both for 6 credits in animal sciences honors
- Program approval by a three-member departmental honors committee
- Submission of a written report plus an oral or poster presentation

## Ag Scholars Program

This program provides early assurance of admission to the MU College of Veterinary Medicine for selected animal science majors on the University of Missouri campus.

High School seniors and MU freshman with an ACT composite score of 27 or more or an equivalent SAT score are eligible for the Ag Scholars Program.

Students must have demonstrated experience or interest in livestock production and health. Examples of appropriate experience may include participation in a livestock enterprise as either a family member or an employee; enrollment in at least two years of high school agricultural coursework; and participation in FFA, 4H or equivalent organizations with projects directly related to livestock production or health. Students who do not meet the standards of demonstrated experience or interest will be admitted if they agree to complete an internship in the summer between their freshman and sophomore years. This internship must entail at least 250 hours of supervised experience in livestock production or a livestock health enterprise.

For additional information, contact:

Preveterinary Medical Scholars and Ag Scholars Programs  
W-203 Veterinary Medicine Bldg.  
College of Veterinary Medicine  
University of Missouri  
Columbia, Missouri 65211  
(573) 884-3341

## Agreement with the College of Veterinary Medicine

The Division of Animal Sciences and the College of Veterinary Medicine have an articulation agreement which enables MU Animal Science majors who are admitted to the College of Veterinary Medicine before completing their B.S. degree to earn a B.S. degree in Animal Sciences during their days as a professional veterinary medicine student. In order to earn a B.S. degree in Animal Sciences the following requirements must be met:

- The student will successfully meet all General Education requirements established by the University of Missouri campus.
- The student will meet any additional college or divisional requirements.
- The student will be required to complete all MU Animal Sciences requirements except for 9 hours of Animal Science Senior electives.
- The student will also be able to substitute up to 20 hours completed in the College of Veterinary Medicine in lieu of general electives in order to complete the total number of student credit hours necessary for a B.S. degree in Animal Sciences.

- The B.S. degree in Animal Science will be granted after successful completion of the first year of Veterinary Medicine.

## Graduate

Department of Animal Science  
 159 Animal Sciences Research Center  
 920 E. Campus Drive, Columbia, MO 65211  
 (573) 882-7446  
<http://animalsciences.missouri.edu/academics/graduates.php>

**Director of Graduate Studies:** Bill Lamberson

- MS in Animal Sciences (p. 55)
- PhD in Animal Sciences (p. 56)

## About Animal Sciences Graduate Programs

The Division of Animal Sciences has a broad-based teaching program, and our faculty members are noted for teaching and mentoring excellence. Our PhD program was recently ranked among the best in the country by the National Research Council and our research program among the best in the world by Reuters. Our graduate program has maintained or increased numbers, support, and placement rates over the past five years. The Division strives to maintain a diverse faculty qualified to teach relevant courses in five discipline areas (reproductive and environmental physiology, ruminant and monogastric nutrition, genetics/genomics, meat science and livestock production) and across six species (swine, dairy cattle, beef cattle, poultry, companion animals and horses) to serve the demand for graduates to be employed nationwide in research, teaching and industry.

## Undergraduate

### Department Level Requirements - Animal Sciences

The Division of Animal Sciences does not have any specific degree requirements over and above those set for the major. Please see the BS in Animal Science (p. 54) page for the major program requirements.

### BS in Animal Sciences

#### Major Program Requirements

Students must complete the University and college requirements in addition to the major program requirements listed below:

##### Division Course Requirements

AN_SCI 1011	Animal Science	3
AN_SCI 1065	Animal Science Laboratory Practicum	2
AN_SCI 2111	Sophomore Seminar: Societal Issues Facing Animal Agriculture	3
AN_SCI 2165	Introduction to Ruminant Livestock Production	3
AN_SCI 2175	Introduction to Monogastric Production	3
AN_SCI 3254	Physiology of Domestic Animals	3
AN_SCI 3255	Physiology of Domestic Animals Laboratory	2
AN_SCI 3212	Principles of Animal Nutrition	3

AN_SCI 3232	Animal Feeds and Feeding	3
AN_SCI 3213	Genetics of Agricultural Plants and Animals	3
AN_SCI 4323	Applied Livestock Genetics	2
Select two Animal Science production System courses from the following:		6
AN_SCI 4975	Beef Production and Management	
AN_SCI 4976	Dairy Production	
AN_SCI 4977	Horse Production	
AN_SCI 4978	Swine Production	
AN_SCI 4979	Poultry Production	
Select one Animal Science Products course from the following:		3
AN_SCI 2114	Live Animal and Meat Evaluation	
AN_SCI 3214	Principles of Meat Science	
AN_SCI 3231	Principles of Dairy Foods Science	
AN_SCI 4354	Physiology and Biochemistry of Muscle as Food	
Select Four Animal Science Senior Electives from the following:		12
AN_SCI 4312	Monogastric Nutrition	
AN_SCI 4314	Physiology of Reproduction	
AN_SCI 4332	Ruminant Nutrition	
AN_SCI 4384	Reproductive Management	
AN_SCI 4387	Equine Breeding Management	
Select one Animal Science Production Systems course from the following:		3
AN_SCI 4975	Beef Production and Management	
AN_SCI 4976	Dairy Production	
AN_SCI 4977	Horse Production	
AN_SCI 4978	Swine Production	
AN_SCI 4979	Poultry Production	
Select one Animal Science Products course from the following:		3
AN_SCI 3214	Principles of Meat Science	
AN_SCI 3231	Principles of Dairy Foods Science	
AN_SCI 4354	Physiology and Biochemistry of Muscle as Food	
AN_SCI 4940	Internship in Animal Science & Technology (maximum of 3 credits)	3
AFNR 2190	International Agriculture and Natural Resources (maximum of 3 credits)	3
Approved undergraduate research (junior or senior status; maximum of 3 credits)		3
<b>Electives</b>		29-35
<b>Total Credits</b>		95-101

#### Curriculum Options

(Note: Options are not listed on transcripts or diplomas.)

In addition to the general Animal Sciences curriculum, the Division of Animal Science offers four specialized curriculum options which include: Animal Products, Biotechnology, Prevet and Production/Business. These options differ slightly in general education requirements and different substantially in departmental requirements. These specific curriculum requirements are available on the division's website (<http://animalsciences.missouri.edu>).

## Animal Products Option

This option works very well for the student who wishes to obtain a minor in Food Science.

## BioTechnology Option

This option applies biological and engineering techniques to the production of animals and animal products. This option should be of interest to students with a sincere interest in research.

## Prevet Option

This option includes all of the courses required for admission to the College of Veterinary Medicine.

## Production/Business Option

Students interested in returning to the farm or possibly managing a farm or pursuing a career in agribusiness will find this option of interest.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
AN_SCI 1011	3	BIO_SC 1500	5
AN_SCI 1065	2	AG_EC 1042	3
AG_EC 1041	3	HIST 1100 or 1200	3
MATH 1100	3	ENGLISH 1000	3
RU_SOC 1000	3	CHEM 1320	4
	14		18
Second Year			
Fall	Credits	Spring	Credits
AN_SCI 2165	3	AN_SCI 2111	3
AN_SCI 2114	3	AN_SCI 2175	3
STAT 1400	3	AN_SCI 3255	2
AN_SCI 3254	3	PHYSICS 1220	4
PHYSICS 1210	4	Elective	3
	16		15
Third Year			
Fall	Credits	Spring	Credits
AN_SCI 3212	3	AN_SCI 3232	3
AN_SCI 3214	3	AN_SCI 3213	3
CHEM 2100 or 2030	3	AN_SCI 4323	2
COMMUN 1200	3	BIOCHM 3630	3
Humanities Course	3	AN_SCI 4314	3
	15		14
Fourth Year			
Fall	Credits	Spring	Credits
AN_SCI 4978	3	AN_SCI 4975	3
AN_SCI 4976	3	AN_SCI 4354	3
AN_SCI 4384	3	AN_SCI 4977	3
AN_SCI 4312	3	Electives	6

Elective Course	3		
	15		15
Total Credits: 122			

## Minor in Animal Sciences

To earn a minor in animal sciences, a student must meet the following requirements.

- A minimum of 15 hours of course credit in Animal Sciences
- A minimum of 9 hours of course work in Animal Sciences courses numbered 3000 or above.
- Students may select any combination of animal sciences courses excluding problems and internships to meet the above requirements; however, all students will be expected to meet prerequisites of animal sciences courses.
- Up to six transfer credits can be applied toward the minor; however, these transfer credits can only apply toward the lower level courses. Hence, a student must complete nine credit hours of Animal Science credits at MU that are 3000 level or higher.

## Graduate

### MS in Animal Sciences

### Master's Degree in Animal Sciences

Admission Contact Information

Cinda Hudlow, 159 ASRC, 920 E. Campus Drive, Columbia, MO 65211.  
(573) 882-7446

<http://animalsciences.missouri.edu/academics/graduates.php>

### Admission Criteria

Fall deadline: Rolling

Minimum TOEFL scores:

Internet-based test (IBT)	Paper-based test (PBT)
61	500

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative
Prior to August 1, 2011	400	550
On or After August 1, 2011	146	146

Minimum GPA: 3.0

Approval of advisor

Bachelor's degree

### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Animal Sciences Program:

- Statement of career objectives
- 3 reference letters
- Résumé
- Official GRE score report

## Graduation Requirements

The standard master's degree program requires a minimum of 30 hours of graduate credit (to include a minimum of 24 hours of formal graduate courses, plus a minimum of six hours of 8090 Research) and an approved thesis based on original research.

Two credit hours in seminar are required for the Master of Science degree.

No more than two 7000-level animal sciences courses can contribute to the plan of study.

## PhD in Animal Sciences

### Doctoral Degree in Animal Sciences

Admission Contact Information

Cinda Hudlow, 159 ASRC, 920 E. Campus Drive, Columbia, MO 65211  
 (573) 882-7446  
<http://animalsciences.missouri.edu/academics/graduates.php>

### Admission Criteria

Fall deadline: Rolling

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative
Prior to August 1, 2011	400	500
On or After August 1, 2011	146	146

Approval of advisor

MS degree (with thesis) preferred

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Animal Sciences Program:*

- Official GRE score report
- Statement of career objectives
- 3 reference letters
- Résumé

### Graduation Requirements

The number of credit hours in formal course work and in research varies with the student's background, training interests and the nature of the research. Four credit hours of seminar and a course in research ethics are required for the doctoral degree. A dissertation based on original research is required of each candidate. Completion of requirements for a doctoral degree is generally expected within three years (five years without prior MS) after admission to the PhD program.



## Biochemistry

Gerald Hazelbauer, Chair  
College of Agriculture, Food and Natural Resources  
117 Schweitzer Hall  
Phone: (573) 882-4845  
Fax: (573) 882-5635

A course of study in the Department of Biochemistry emphasizes the application of chemical principles to biological systems and leads to the Bachelor of Science in Biochemistry. The program requires rigorous course work in the basic sciences, culminating with a two course capstone experience of discipline specific problems and laboratory techniques. Students are encouraged to gain research experience through independent projects in faculty labs. The biochemistry degree prepares students for further study in graduate or professional school or for a career in biochemistry, biotechnology or the biological, chemical or medical sciences.

### Faculty

**Professor** S. J. Chen\*, S. Deutscher\*\*, D. Emerich\*\*, W. Folk\*\*, K. Gates\*, T. Guilfoyle\*\*, M. Hannink\*\*, G. Hazelbauer\*\*, M. Henzl\*\*, D. Lubahn\*\*, T. Mawhinney\*\*, B. McClure\*\*, T. Quinn\*\*, L. Randall\*\*, R. M. Roberts\*\*, F. Schmidt\*\*, K. Sharma\*\*, G. Stacey\*\*, G. Sun\*\*, J. Tanner\*, P. Tipton\*\*, R. Tsika\*\*, S. Van Doren\*\*, W. Volkert\*\*, J. Wall\*\*, G. Weisman\*\*, S. Zhang\*\*

**Associate Professor** L. Beamer\*\*, D. Burke\*\*, M. Martin\*, S. Peck\*\*, B. Peculis\*\*, M. Petris\*\*, C. Phillips\*\*, J. Thelen\*\*, X. Zou\*\*

**Assistant Professor** P. Cornish\*\*, A. Heese\*\*, G. King\*, A. Koo\*\*, T. Nevitt\*\*, S. Sarafianos\*, M. Siegel\*

**Research Professor** G. Hagen\*

**Research Associate Professor** L. Erb\*, A. Simonyi\*

**Research Assistant Professor** B. Mooney, V. Mossine

**Adjunct Assistant Professor** J. Miernyk\*\*

**Associate Teaching Professor** S. Freyermuth

**Assistant Teaching Professor** C. Lee, M. Pennella

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 58)
- BS in Biochemistry (p. 58)

### Graduate

College of Agriculture, Food and Natural Resources; School of Medicine  
117 Schweitzer Hall  
573-882-4846  
<http://www.biochem.missouri.edu/>

**Director of Graduate Studies:** Thomas Quinn

- MS in Biochemistry (p. 59)
- PhD in Biochemistry (p. 59)

Biochemistry at the University of Missouri is a division of the College of Agriculture, Food and Natural Resources and a department of the School of Medicine. As a nationally ranked top 10 biochemistry department among public medical schools, we offer outstanding training that help students achieve their goals. We have 39 core faculty members and approximately 10 additional members, all of whom are available to mentor students in biochemistry. Nearly all facets of contemporary biochemical research are represented in their collective research interests. Our highly interactive program is an integral part of a campus-wide network of research programs including life sciences, genetics, nutrition, plant biochemistry and structural biology.

### Interdisciplinary Area Programs

- PhD in the nutrition area program
- PhD in the genetics area program
- Minors in Business, College Teaching, and International Relations

The graduate programs of the Department of Biochemistry prepare students for professional careers in academic institutions, industry and government. The Department of Biochemistry is administered by the College of Agriculture, Food and Natural Resources and the School of Medicine. It provides a great range of opportunities for multidisciplinary study in plant, animal and microbial biochemistry, molecular biology, structural biology, and chemical biology.

### Faculty Research

Virtually every important area of biochemistry and molecular biology is represented among the research interests of the faculty. These interests focus on plant biochemistry, hormonal control of plant and animal-cell metabolism, growth-factor structure and function, enzyme reaction mechanisms, biochemistry of development, biochemistry of human disease, lipid and carbohydrate metabolism, molecular biology, analytical biochemistry, proteomics, systems biochemistry, and structural biochemistry.

### Facilities

The department has modern, well-equipped laboratories in the Life Sciences Center, Schweitzer Hall, Schlundt Annex, and Stephens Hall. Additional faculty are housed in the Animal Sciences Research Center, Chemistry Building, Dalton Cardiovascular Research Center, Mason Eye Institute, and the Truman Veterans Hospital.

### Plans of Study

All students participate in individually planned research programs and have a supervised teaching experience along with course work. Students are expected to complete a program of courses in biochemistry and selected courses in modern biology and chemistry.

### Careers

Biochemistry at the University of Missouri provides world-class training that can open the door to a wide variety of career opportunities in the life sciences. Our graduates have career opportunities available in academia, industry, agriculture or medicine.

## Required Application Materials

All pre-requisites and application materials must be submitted by the annual deadline.

## MD/PhD in Biochemistry Dual Degree Program

Students already accepted into the School of Medicine at MU may apply to the Department for acceptance into the MD/PhD program. Students matriculating in the MD/PhD degree program must complete degree requirements of both the School of Medicine and the Graduate School. For information and for application forms, email [gradprogram@missouri.edu](mailto:gradprogram@missouri.edu) or write the Director of Graduate Admissions in Biochemistry, 117 Schweitzer Hall, Columbia, MO 65211, or visit the website <http://www.biochem.missouri.edu>.

## Undergraduate

### Department Level Requirements - Biochemistry

The department of Biochemistry does not have any specific degree requirements over and beyond those set for the major. Please see the BS in Biochemistry (p. 58) page for the major program requirements.

### BS in Biochemistry

#### Major Program Requirements

Students must complete the university general education (p. 18) and graduation requirements, in addition to the major program requirements listed below:

##### Major core requirements

<b>Biochemistry</b>		20
BIOCHM 1090	Introduction to Biochemistry (Fall semester only)	3
BIOCHM 1094	Introductory Biochemistry Laboratory (Spring semester only)	2
BIOCHM 2480	Introduction to Macromolecular Structure and Function (Spring semester only)	2
BIOCHM 2484	Macromolecular Techniques Laboratory (Fall semester only)	2
BIOCHM 4270	Biochemistry (First semester of two semester sequence)	3
BIOCHM 4272	Biochemistry (Continuation of Biochm 4270)	3
BIOCHM 4300	Physical Chemistry of Biological Systems (Fall semester only)	3
BIOCHM 4974	Biochemistry Laboratory (Writing intensive)	5
BIOCHM 4970	Senior Seminar in Biochemistry (Capstone)	1
<b>Biology</b>		9
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
BIO_SC 2200	General Genetics	4
or AN_SCI 3213	Genetics of Agricultural Plants and Animals	
or PLNT_S 3213	Genetics of Agricultural Plants and Animals	
<b>Chemistry</b>		20

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I (Concurrent with Chem 2110)	2
<b>Mathematics</b>		10
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
<b>Physics</b>		8
PHYSICS 1210	College Physics I	4-5
or PHYSICS 2750	University Physics I	
PHYSICS 1220	College Physics II	4-5
or PHYSICS 2760	University Physics II	

##### Advanced science \*

\* Science courses numbered 2000 or above that are not used to fulfill other major requirements. See list of approved courses here: <http://biochem.missouri.edu/undergrad-program/graduation-requirementsII.php>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
BIOCHM 1090	3	CHEM 1330	4
CHEM 1320	4	ENGLISH 1000	3
BIO_SC 1500	5	MATH 1500	5
RU_SOC 1000	3	BIOCHM 1094	2
Elective (FIG, SSC, Library, etc)	1		
	16		14
Second Year			
Fall	Credits	Spring	Credits
CHEM 2100	3	CHEM 2110	3
AG_EC 1041	3	CHEM 2130	2
BIO_SC 2200	4	AG_EC 1042	3
BIOCHM 2484	2	BIOCHM 2480	2
MATH 1700	5	BIO_SC 2300	4
	17		14
Third Year			
Fall	Credits	Spring	Credits
BIOCHM 4270	3	BIOCHM 4272	3
PHYSICS 1210	4	PHYSICS 1220	4
HIST 1100	3	AG_ED 2220	3
Elective (Writing Intensive)	3	Advanced Science Elective	4
Elective	2		
	15		14

Fourth Year			
Fall	Credits	Spring	Credits
BIOCHM 4300	3	BIOCHM 4970	1
Advanced Science Elective	3	BIOCHM 4974	5
Humanities Elective	3	Humanities Elective	3
Communications Elective	3	Electives	6
Elective	3		
	15		15
Total Credits: 120			

## Dual Degree Biochemistry-Environmental Sciences Program

The Division of Biochemistry and the Department of Soil, Environmental and Atmospheric Sciences offer a dual BS degree in Biochemistry and in Soil, Environmental and Atmospheric Sciences with an Environmental Science emphasis. For more information, contact David Emerich in the Division of Biochemistry or check the Biochemistry Undergraduate Program webpage <http://biochem.missouri.edu/undergrad-program/index.php>.

## Graduate

### MS in Biochemistry

Admission Contact Information:  
[gradprogram@missouri.edu](mailto:gradprogram@missouri.edu)  
 117 Schweitzer Hall  
 Columbia, MO 65211  
 573-882-4846

### Admission Criteria

ADMISSION BY WRITTEN DEPARTMENTAL REQUEST ONLY

### PhD in Biochemistry

Admission Contact Information  
[gradprogram@missouri.edu](mailto:gradprogram@missouri.edu)  
 117 Schweitzer Hall  
 Columbia, MO 65211  
 573-882-4846

### Admission Criteria

Fall deadline: January 5

Minimum GPA: 3.0

Graduate Record Exam (GRE) required

TOEFL required for international students

Undergraduate research required

### PhD Prerequisites

The following entrance requirements must be met:

- Mathematics through one year of calculus
- Biological sciences (at least one course)
- 1 year of physics

- 1 year of organic chemistry (with a laboratory)
- Biochemistry (lecture and laboratory)

Strongly Recommended Courses:

- Genetics (at least one course)
- Quantitative analysis
- Physical chemistry course with a calculus prerequisite

These prerequisites should have been met during the undergraduate curriculum. Recommended courses may be taken during the first year of the graduate program. Satisfactory completion of a qualifying exam is expected by the end of the first year and of a comprehensive examination by the end of the second academic year in graduate study.

### Required Application Materials

All materials must be sent to the Graduate School

- University of Missouri Graduate School Application ApplyYourself on line application
- Official transcripts from all undergraduate and graduate institutions applicant has attended. Submit online to graduate school.
- Three letters of reference using our reference PDF. Submit online to graduate school.
- 500-word personal statement about your goals and experience. Submit online to graduate school.
- Official GRE scores. Submit using institution code 6875 and department code 0202.
- International applicants: If your first language is not English, please submit your official TOEFL scores using institution code 6875 and department code 34.

Program details can be found in the Graduate Student Handbook (<http://biochem.missouri.edu/docs/current-graduate-handbook.pdf>).

## Fisheries and Wildlife Sciences

J. R. Jones  
School of Natural Resources  
302 Anheuser-Busch Natural Resources Building  
(573) 882-3543

The fisheries and wildlife sciences degree is based on a common foundation of biological sciences, ecology, conservation, communication, analytical, social science, humanities and professional courses that provide students with a basic liberal education as well as prerequisites for additional professional courses.

Most students take courses that prepare them for entry-level, technical positions in fisheries, wildlife or water quality management with local, state or federal agencies. Such training usually involves taking courses that meet the standards set by The Wildlife Society or the American Fisheries Society to become certified, professional wildlife or fisheries biologists. Other students may complete a program that emphasizes more advanced study and prepares them for careers in resource management, research or administration.

The department offers BSFW, MS and PhD degrees with majors in Fisheries and Wildlife Sciences.

### Faculty

**Professor** J. Faaborg\*\*, M. E. Gompper\*\*, J. R. Jones\*, J. J. Millspaugh\*\*, C. H. Nilon\*\*, M. R. Ryan\*\*

**Associate Professor** R. S. Hayward\*, D. B. Noltie\*

**Assistant Professor** D. Kesler\*\*

**Extension Assistant Professor** R. A. Pierce II\*

**Teaching Assistant Professor** T. Strauch

**Research Assistant Professor** J. Whittier\*

**Adjunct Assistant Professor** D. Diamond\*, M. Hubbard, D. Papoulias\*, S. Sowa\*, D. Tillitt\*, L. Vangilder, M. Wildhaber\*\*

**Cooperative Associate Professor** D. Galat\*\*, C. P. Paukert\*\*, C. F. Rabeni\*\*, A. E. Rosenberger, F. R. Thompson III\*\*, E. B. Webb\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 61)
- BSFW in Fisheries and Wildlife (p. 62)

### Graduate

The School of Natural Resources  
302 Anheuser-Busch Natural Resources Building  
573-882-3436  
<http://www.snr.missouri.edu/fw/>

Fisheries and Wildlife Sciences emphasis areas are part of the degree program in Natural Resources. They emphasize resource management at organismal, population, or ecosystem scales. An emphasis on resource

management helps distinguish our program from basic biology; therefore, course work in fisheries or wildlife management, environmental science, resource policy, or other applied ecology fields is advantageous. The program of study includes communications, quantitative skills, and basic courses in physical and social sciences. Core classes in biology and ecology and specialized courses that feature animal populations and their aquatic and terrestrial environments enhance the learning experience. Areas of study include wildlife ecology, water quality, habitat management, fisheries science, and conservation biology.

### Careers

Graduate studies in fisheries, limnology, conservation biology, or wildlife prepare students for careers with state and federal agencies, consulting firms, private conservation organizations, or academic institutions.

### Graduate Certificates

Graduate certificates in conservation biology, college teaching, and geographic information systems (GIS) are available to students who elect to take courses beyond those required for the graduate degree.

### Facilities & Resources

The Department of Fisheries and Wildlife Sciences is housed in the Anheuser-Busch Natural Resources Building. This building provides space for faculty and graduate student offices in close proximity to well-equipped research and teaching laboratories, classrooms, and computer facilities.

### Baskett Wildlife Research and Education Center

The Thomas S. Baskett Wildlife Research and Education Area, formerly known as the Ashland Wildlife Research Area, is a 2,252-acre facility located 5 miles east of Ashland, Missouri, on Highway Y. In use since 1938, it has become an integral part of the School of Natural Resources mission of teaching, research, and extension. The Baskett Area is used as an outdoor laboratory for several classes, including dendrology, ornithology, and wildlife research techniques, and has been the source of more than 150 research publications. For more information see <http://www.aes.missouri.edu/baskett/index.stm>

### The Missouri Cooperative Fish and Wildlife Research Unit

The Missouri Cooperative Fish and Wildlife Research Unit affiliated with the department is operated through a cooperative agreement among the University of Missouri, the Missouri Department of Conservation, and the United States Geological Survey. It is staffed with two Department of the Interior scientists who are members of the university faculty and who offer graduate-level courses and direct graduate student research.

### Vertebrate Collections

The School of Natural Resources also maintains an extensive teaching collection of the vertebrate animals of Missouri, surrounding states, and other countries. The bird and mammal collections contain more than 7,000 specimens. The Glen Smart waterfowl collection consists of more than 200 species of mounted waterfowl of the world. The fish collection contains about 25,000 preserved specimens, including freshwater fishes from Missouri and the Midwest and saltwater fishes from the Atlantic, Pacific, and Gulf coasts.

## Funding

Fellowships and teaching and research assistantships are available for most applicants selected for admission. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details. We require applicants to contact faculty to determine the availability of research assistantships prior to applying to the program.

## Undergraduate

### Department Level Requirements - Fisheries and Wildlife

The Department of Fisheries and Wildlife does not have any specific degree requirements over and above those set for the major. Please see the BSWF in Fisheries and Wildlife (p. 62) page for the major program requirements.

### Dual Major Requirements - Fisheries and Wildlife/Forestry

In addition to courses that satisfy General Education requirements, students who plan to complete a Dual Major in Fisheries & Wildlife and Forestry must complete the required F&W, Forestry and elective options to reach 140 credits (this total does not allow any general elective hours).

#### Major Core Requirements

Science Core		
CHEM 1320	College Chemistry I	4
Physics (select one)		
PHYSICS 1210	College Physics I	
ATM_SC 1050	Introductory Meteorology	
GEOL 1100	Principles of Geology with Laboratory	4
SOIL 2100	Introduction to Soils	3
SOIL 2106	Soil Science Laboratory	2
General Biology		
BIO_SC 1200	General Botany with Laboratory	5
F_W 1100	Introductory Zoology with Laboratory	3-5
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
Ecology (select one)		
BIO_SC 3650	General Ecology	
FOREST 4320	Forest Ecology *	
Animal Form/Function course (select one)		
MPP 3202	Elements of Physiology	
AN_SCI 3254 & AN_SCI 3255	Physiology of Domestic Animals and Physiology of Domestic Animals Laboratory	
BIO_SC 3700	Animal Physiology	
BIO_SC 2300	Introduction to Cell Biology	
Genetics (select one)		
F_W 2500	Introduction to Genetics and Evolution for Conservation	
BIO_SC 2200	General Genetics	

AN_SCI 3213	Genetics of Agricultural Plants and Animals	
<b>Math Sequence</b>		
MATH 1100	College Algebra	3
MATH 1400	Calculus for Social and Life Sciences I	3
STAT 2530	Statistical Methods in Natural Resources	3
<b>Professional Core</b>		
NAT_R 1070	Ecology and Renewable Resource Management	3
F_W 2100	Colloquium in Fisheries and Wildlife	1
Public Speaking (select one)		
AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources	
P_R_TR 3231	Principles of Interpretive Outdoor Recreation	
Plant Taxonomy		
FOREST 2151	Dendrology	4
Law/Policy		
NAT_R 4353	Natural Resource Policy/Administration	3
NAT_R 3110	Natural Resource Biometrics	3
Water Quality (select one)		
F_W 3400	Water Quality and Natural Resource Management	
FOREST 4390	Watershed Management and Water Quality	
F_W 3600	Introduction to Conservation Biology	3
FOREST 4330	Practice of Silviculture	3
F_W 4500	Animal Population Dynamics and Management	3
NAT_R 4970	Resource Practicum in Natural Resources	3
Senior Capstone Course: Complete one from Forestry and one from Fisheries and Wildlife from approved list of 4000 level courses in Professional Tracks		
<b>Summer Field Studies</b>		
(must be taken concurrently)		
FOREST 2540	Forest Hydrology Field Studies	1
FOREST 2541	Forest Utilization	1
FOREST 2542	Forest Measurement and Inventory	1
FOREST 2543	Forest Ecology Field Studies	1
FOREST 2544	Introduction to Silviculture and Management	1
FOREST 2545	Forest Management Planning	1
<b>Professional Track Courses</b>		
(Minimum of 10 courses AND 32 hours required)		
<b>Fisheries and Wildlife Core - 5 courses minimum</b>		
A. Science and Natural History (must take at least 1 Terrestrial and 1 Aquatic. Only 1 outside F_W)		
F_W 2600	Ornithology	4
F_W 2700	Ichthyology	4
F_W 3660	Mammalogy	4
F_W 4100	Limnology	3-4
BIO_SC 3360	Herpetology	4
BIO_SC 3710 & BIO_SC 3715	Introductory Entomology and Insect Diversity	5
B. Management - (must take at least 1 Terrestrial and 1 Aquatic)		
F_W 2900	Principles of Wildlife Management	4
F_W 3900	Ecology of Fishes	3
F_W 4300	Fisheries Management	3

F_W 4220	Human Dimensions of Fish and Wildlife Conservation	3
F_W 4400	Techniques for Fisheries Management and Conservation	4
F_W 4600	Ecosystem Management	4

C. Specialty Courses (5th course can come from this list or from A or B)

F_W 4220	Human Dimensions of Fish and Wildlife Conservation	3
F_W 4650	Wildlife Management Planning	3
F_W 4700	Wildlife Research and Management Evaluation Methods	4
F_W 3200	Aquaculture	3
F_W 4200	Urban Wildlife Conservation	3
F_W 4880	Waterfowl Ecology and Management	3

International Studies or Study Abroad (approved FW Proposal required)

**Forest Core - 15 hours minimum**

FOREST 3207	Forest Fire Control and Use	2
FOREST 3212	Forest Health and Protection	4
FOREST 3240	Wood Technology	3
FOREST 3290	Urban Forestry	2
FOREST 4320	Forest Ecology *	5
NAT_R 4325	Introduction to Geographic Information Systems	3
FOREST 4350	Forest Economics *	3
FOREST 4360	Photogrammetry, Inventory and Models	3
FOREST 4375	Forest Stand Dynamics	3
FOREST 4380	Forest Resource Management	3
FOREST 4390	Watershed Management and Water Quality	3

The following courses collectively meet the requirements for the SAF accredited Forest Resource Management curriculum:

FOREST 3207	Forest Fire Control and Use
& FOREST 3212	and Forest Health and Protection and Wood Technology
& FOREST 3240	and Forest Ecology and Tree Physiology
& FOREST 4320	and Forest Economics and Photogrammetry, Inventory and Models
& FOREST 4340	and Forest Resource Management and Watershed Management and Water Quality
& FOREST 4350	
& FOREST 4360	
& FOREST 4380	
& FOREST 4390	

\* Required as a minimum for Forestry Certification if the accredited curriculum has not been completed.

## BSFW in Fisheries and Wildlife

### Major Program Requirements

In addition to courses that satisfy General Education (p. 18) requirements, students earning a BS in Fisheries and Wildlife Sciences must complete required F&W courses and elective options to reach 125 credits. **Students must earn C- or better in all courses applied to degree.**

**Major core requirements**

<b>Science core:</b>		
CHEM 1320	College Chemistry I	4
Earth Science (select one)		4-5
GEOL 1100	Principles of Geology with Laboratory	
SOIL 2100 & SOIL 2106	Introduction to Soils and Soil Science Laboratory	
Physics (select one)		3-4
PHYSICS 1210	College Physics I	
ATM_SC 1050	Introductory Meteorology	
General Biology		5
BIO_SC 1200	General Botany with Laboratory	5
F_W 1100	Introductory Zoology with Laboratory	5
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
BIO_SC 3650	General Ecology	5
Animal Form/Function course (select one)		4-5
MPP 3202	Elements of Physiology	
AN_SCI 3254 & AN_SCI 3255	Physiology of Domestic Animals and Physiology of Domestic Animals Laboratory	
BIO_SC 3700	Animal Physiology	
BIO_SC 2300	Introduction to Cell Biology	
Genetics (select one)		3-4
F_W 2500	Introduction to Genetics and Evolution for Conservation	
BIO_SC 2200	General Genetics	
AN_SCI 3213	Genetics of Agricultural Plants and Animals	
<b>Math Sequence</b>		
MATH 1100	College Algebra	3
MATH 1400	Calculus for Social and Life Sciences I	3
STAT 2530	Statistical Methods in Natural Resources	3
<b>Professional Core</b>		
NAT_R 1070	Ecology and Renewable Resource Management	3
F_W 2100	Colloquium in Fisheries and Wildlife	1
Public Speaking (select one)		3
COMMUN 1200	Public Speaking	3
AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources	
P_R_TR 3231	Principles of Interpretive Outdoor Recreation	
Plant Taxonomy (select one)		4
BIO_SC 3210	Plant Systematics	
FOREST 2151	Dendrology	

Law/Policy

NAT_R 4353	Natural Resource Policy/Administration	3
NAT_R 3110	Natural Resource Biometrics	3
F_W 3600	Introduction to Conservation Biology	3
F_W 4500	Animal Population Dynamics and Management	3
NAT_R 4970	Resource Practicum in Natural Resources	3

Senior Capstone Course - Choose from approved selection of 4000 level Fisheries and Wildlife courses below

**Professional Track**

Course (select 7 courses, minimum 24 hours, with at least two courses from each track. Note: tracks do not appear on transcript) 24

**Terrestrial Track**

(select 2 from Terr A; Terr B; any 2 from Aquatic Track; and any one other Professional Track course) 4

**A. Science and Natural History**

- F\_W 2600 Ornithology
- F\_W 3660 Mammalogy

Not more than one from this group:

- BIO\_SC 3260 Invertebrate Zoology
- BIO\_SC 3360 Herpetology
- BIO\_SC 3710 Introductory Entomology & BIO\_SC 3715 and Insect Diversity

**B. Management and Applications**

- F\_W 2900 Principles of Wildlife Management
- F\_W 4220 Human Dimensions of Fish and Wildlife Conservation
- F\_W 4600 Ecosystem Management
- F\_W 4650 Wildlife Management Planning
- F\_W 4700 Wildlife Research and Management Evaluation Methods

**Aquatic Track**

(select 2 from Aquatic A; 2 from Aquatic B; any two from Terrestrial Track; and any one other Professional Track course)

**A. Science and Natural History**

- F\_W 2700 Ichthyology
- F\_W 4100 Limnology

Not more than one from this group:

- BIO\_SC 3260 Invertebrate Zoology
- BIO\_SC 3360 Herpetology
- BIO\_SC 3710 Introductory Entomology & BIO\_SC 3715 and Insect Diversity

**B. Management and Applications**

- F\_W 3400 Water Quality and Natural Resource Management
- F\_W 3900 Ecology of Fishes
- F\_W 4220 Human Dimensions of Fish and Wildlife Conservation
- F\_W 4300 Fisheries Management
- F\_W 4400 Techniques for Fisheries Management and Conservation

**Disciplinary Electives**

can be used as seventh Professional Track course. Choose from a list of approved courses.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ATM_SC 1050	3	ENGLISH 1000	3
BIO_SC 1200	5	F_W 1100	5
MATH 1100	3	NAT_R 1070	3
Elective	3	HIST 1100	3
	14		14
Second Year			
Fall	Credits	Spring	Credits
MATH 1400	3	F_W 2500	3
F_W 2100	1	STAT 2530	3
SOIL 2100	3	AG_EC 1041	3
SOIL 2106	2	Professional Course	4
CHEM 1320	4	Social Science Elective	3
Humanities Elective	3		
	16		16
Third Year			
Fall	Credits	Spring	Credits
NAT_R 3110	3	F_W 3600	3
AG_ED 2220	3	BIO_SC 3210	4
BIO_SC 3650	5	Professional Course	4
Professional Course	4	AG_EC 2156	3
		Humanities Elective	3
	15		17
Fourth Year			
Fall	Credits	Spring	Credits
MPP 3202	5	F_W 4500	3
Professional Course	4	Capstone Course	4
Professional Course	4	Professional Course	3
Humanities Elective	3	Professional Course	3
		Other Elective	3
	16		16
Total Credits: 124			

## Food Science and Nutrition

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Food Science  
256 William Stringer Wing  
(573) 882-6746  
Fax: (573) 884-7964

Ingolf Gruen, Program Chair  
grueni@missouri.edu  
(573) 882-4113  
<http://foodscience.missouri.edu>

Andrew Clarke, Undergraduate Advisor Chair  
(573) 882-2610  
clarkea@missouri.edu

Azlin Mustapha, Director of Graduate Studies  
(573) 882-2649  
mustaphaa@missouri.edu

Typical employment areas for graduates of the food science program include quality assurance, quality control, product development, sensory science and flavor chemistry. The food science curriculum meets the standards established by the Institute of Food Technologists.

### Faculty

**Professor** F. H. Hsieh\*\*  
**Associate Professor** S. Cho\*, A. D. Clarke#, J. Groves\*, I. U. Gruen\*\*, D-Y. Kim, M. Lin\*\*, A. Mustapha\*\*  
**Assistant Professor** M. Kwasniewski, B. Vardhanabhuti\*  
**Adjunct Associate Professor** L. Occena-Po\*  
**Adjunct Assistant Professor** G. Zheng\*  
**Assistant Teaching Professor** L. Jett  
**Research Professor Emeritus** M. Ellersieck\*  
**Professor Emeritus** R. T. Marshall\*  
**Adjunct Teaching Instructor** B. Langford

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 64)
- BS in Food Science and Nutrition (p. 64)
- Minor in Food Science and Nutrition (p. 66)

The department offers the Bachelor of Science degree with a major in Food Science and Nutrition within four tracks, namely Food Science, Food Business, Enology and Culinary Sciences. A minor is available.

Note: Tracks do not appear on transcripts or diplomas.

### Graduate

College of Agriculture, Food and Natural Resources  
256 William Stringer Wing  
573-882-4113

<http://foodscience.missouri.edu>

**Director of Graduate Studies:** Azlin Mustapha

- MS in Food Science (p. 66)
- PhD in Food Science (p. 67)

### About Food Science

Candidates are prepared for careers in research or advanced professional careers in the food industry, teaching positions in community and junior colleges, 4-year colleges and in supporting roles in academics or industry. Graduates also may play leadership roles in extension or other adult education programs, food production and quality assurance, or government agencies. Selected careers include research and development for private industry or the federal government, food plant supervision, technical operation, product development, nutrition, distribution, food service and food regulatory work.

### Facilities and Resources

Departmental cooperation with the food industry is excellent. Special facilities for food science study and research include chemical, microbiological, analytical laboratories and pilot plants to study food processing.

### Funding

Assistantships are available to qualified students from funds provided by the Agricultural Experiment Station, research contracts and grants. Fellowships supported by industry and professional societies, based on national competition, are also available.

## Undergraduate

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### Department Level Requirements - Food Science and Nutrition

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The Division of Food Systems and Bioengineering does not have any specific degree requirements over and above those set for the major. Please see the BS in Food Science and Nutrition (p. 64) page for the major program requirements.

## BS in Food Science and Nutrition

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### Major Program Requirements

All requirements listed below are in addition to University and College requirements, including University General Education (p. 18).

#### Major Core Requirements

<b>Biological and Physical Science</b>		22
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
General Chemistry and Laboratory		6
CHEM 2030	Survey of Organic Chemistry	3
CHEM 2130	Organic Laboratory I	2
BIOCHM 3630	General Biochemistry	3
<b>Math and Statistics</b>		9-12
Calculus		3-5
STAT 1400	Elementary Statistics for Life Sciences (or STAT 1200 or STAT 1300)	3



<b>English and Communications</b>	9
<b>Social and Behavioral Sciences</b>	12
Microeconomics	3
Macroeconomics	3
Social Science Elective	3
State Law Requirement Course	3
<b>Core Courses for All Tracks</b>	18
F_S 1030 Food Science and Nutrition	3
AFNR 2115 College to Career: Strategies for Success	1
F_S 2172 Elements of Food Microbiology	3
F_S 4199 Food Industry Senior Seminar	1
F_S 4310 Food Chemistry and Analysis	4
F_S 4370 Food Microbiology	3
<b>Capstone Courses</b>	3
F_S 4970 Food Product Development	3
F_S 4980 Food Quality Assurance	3

## Food Science Track

(Note: Tracks are not listed on transcripts or diplomas.)

### Food Science Track Core Courses (20 credits required)

NUTR_S 2340 Human Nutrition I	3
F_S 3250 Physical Principles for Food Processing or BIOL_EN 4160 Food Process Engineering	3
F_S 4311 Investigation of Food Properties	3
F_S 4315 Food Chemistry and Analysis Laboratory	3
F_S 4375 Food Microbiology Laboratory	2
F_S 4380 Sensory Analysis of Food and Beverages	3

### Business course (3 credits)

Ag. Econ/Business School/Hospitality Mgmt course

### Choose 2 of 3 blocks (12-14 credits)

F_S 3214 Principles of Meat Science & F_S 4344 and Processing Muscle Foods	6
F_S 3231 Principles of Dairy Foods Science & F_S 4331 and Technology of Dairy Products and Ingredients	6
F_S 3240 Principles of Viticulture I & F_S 4440 and Principles of Winemaking and Wine Chemical Analysis	8

**Total Credits** 29-31

## Food Business Track

(Note: Tracks do not appear on transcripts or diplomas.)

### Food Business Track Core Courses (4-11 credits)

Food Electives - 3 courses from the following:	7-10
F_S 1010 Introduction to Viticulture and Enology	
AG_S_M 1040 Physical Principles for Agricultural Applications	
HSP_MGMT 1991 Food Service Sanitation Management	
HSP_MGMT 1995 Culinary Fundamentals	
F_S 2114 Live Animal and Meat Evaluation	
F_S 2131 Dairy Products Evaluation	
F_S 2195 Grapes and Wines of the World	

NUTR_S 2340 Human Nutrition I	
F_S 3190 Study Abroad: International Meat, Dairy and Enology	
F_S 3214 Principles of Meat Science	
F_S 3231 Principles of Dairy Foods Science	
F_S 3240 Principles of Viticulture I	
F_S 3250 Physical Principles for Food Processing	
F_S 4311 Investigation of Food Properties	
F_S 4315 Food Chemistry and Analysis Laboratory	
F_S 4340 Principles of Viticulture II	
F_S 4354 Physiology and Biochemistry of Muscle as Food	
F_S 4375 Food Microbiology Laboratory	
F_S 4380 Sensory Analysis of Food and Beverages	
F_S 4390 Optimization and Management of Food and Agricultural Systems	
F_S 4441 Cellar Operations and Special Vinifications	
F_S 4941 Internship in Food Science	

### Business Courses

ACCTCY 2036 Accounting I & ACCTCY 2037 and Accounting II	6
AG_EC 3282 Agribusiness Finance	3
AG_EC 3260 General Farm Management	3
AG_EC 3224 New Products Marketing	3
AG_EC 3256 Agribusiness and Biotechnology Law	3
AG_EC Electives	6

### Choose 1 of 3 courses below (3-4 credits)

F_S 4331 Technology of Dairy Products and Ingredients	3
F_S 4344 Processing Muscle Foods	3
F_S 4440 Principles of Winemaking and Wine Chemical Analysis	4

**Total Credits** 34-38

## Enology Track

(Note: Tracks are not listed on transcripts or diplomas.)

### Enology Track Core Courses

F_S 1010 Introduction to Viticulture and Enology	1
F_S 2195 Grapes and Wines of the World	3
F_S 3240 Principles of Viticulture I	4
F_S 4315 Food Chemistry and Analysis Laboratory	3
F_S 4340 Principles of Viticulture II	4
F_S 4375 Food Microbiology Laboratory	2
F_S 4380 Sensory Analysis of Food and Beverages	3
F_S 4440 Principles of Winemaking and Wine Chemical Analysis	4
F_S 4441 Cellar Operations and Special Vinifications	3
F_S 4941 Internship in Food Science	1-6

### Business course (3 credits)

Ag. Econ/Business School/Hospitality Mgmt Course

**Total Credits** 28-33

## Culinary Science Track

(Note: Tracks are not listed on transcripts or diplomas.)

### Culinary Science Track Core Courses

#### Core Food Science courses

NUTR_S 2340	Human Nutrition I	3
F_S 3250	Physical Principles for Food Processing	3
F_S 3214	Principles of Meat Science	3
or F_S 3231	Principles of Dairy Foods Science	
F_S 4380	Sensory Analysis of Food and Beverages	3
F_S 4390	Optimization and Management of Food and Agricultural Systems	3

#### Core Hospitality Mgmt courses

HSP_MGMT 1043	Introduction to Hospitality Management	3
HSP_MGMT 1133	Hospitality Law	3
HSP_MGMT 1991	Food Service Sanitation Management	1
HSP_MGMT 1995	Culinary Fundamentals	3
HSP_MGMT 2123	Food Service Operational Fundamentals	2
HSP_MGMT 2143	Introduction to Food Production and Service Fundamental	2
HSP_MGMT 3153	Food Service Operations Management	3
Internship		3

#### Additional Capstone Course (optional)

HSP_MGMT 4985	Commercial Food Production Management	
<b>Total Credits</b>		<b>35</b>

## Semester Plan

Below is a sample plan of study for the Food Science Track, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
AFNR 1115	1	CHEM 1330	4
CHEM 1320	4	MATH 1300, 1400, or 1500	3-5
F_S 1030	3	ENGLISH 1000	3
MATH 1100	3	BIO_SC 1500	5
HIST or POL SC	3		
Elective	3		
	17		15-17
Second Year			
Fall	Credits	Spring	Credits
Humanities Elective	3	AG_S_M 1040	3
Food Science Commodity Elective	3	F_S 2172	3
Electives	5	AFNR 2115	1

CHEM 2030	3	BIOCHM 3630	3
CHEM 2130	2	COMMUN 1200	3
		Food Science Commodity Elective	3
	16		16
Third Year			
Fall	Credits	Spring	Credits
F_S 4980	3	STAT 1400	3
AG_EC 1041	3	F_S 4315	3
F_S 4370	3	AG_EC 1042	3
F_S 4375	2	NUTR_S 2340	3
Communication Elective	3	Psychology, Sociology or Rural Sociology	3
Elective	3		
	17		15
Fourth Year			
Fall	Credits	Spring	Credits
F_S 4199	1	F_S 4344	3
F_S 4310	4	F_S 4311	3
F_S 4970	3	Business Elective	3
F_S 3250	3	Humanities Elective	3
Food Science Commodity Elective	3	Elective	3
Elective	2		
	16		15
Total Credits: 127-129			

## Minor in Food Science and Nutrition

Food Science Courses (minimum)	15	
F_S 1030	Food Science and Nutrition	3
One of the following disciplinary courses:	3-4	
F_S 3250	Physical Principles for Food Processing	
F_S 4310	Food Chemistry and Analysis	
F_S 4370	Food Microbiology	
F_S 4380	Sensory Analysis of Food and Beverages	
One of the following capstone courses:	3	
F_S 4970	Food Product Development	
F_S 4980	Food Quality Assurance	
Two other Elective Courses in Food Science	3	

9 of the 15 credits need to be fulfilled with 3000-level or higher Food Science courses.

Cross-listed courses can be taken in either the home program or the cross-listed program.

## Graduate

### MS in Food Science

### Admission Contact Information

JoAnn Lewis (lewisj@missouri.edu)

256 William Stringer Wing  
Columbia, MO 65211-5160  
573-882-4113

## Admission Criteria

Fall deadline: April 1  
Spring deadline: October 31

- Minimum GPA: 3.0
- BS in food science from an accredited university

Internet-based test (iBT)	Paper-based test (PBT)
79	550

Item	Score
IELTS	5.5

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	3.5
On or After August 1, 2011	297	3.5

- \* Note: neither the verbal or quantitative section can be below 400 or its equivalent score.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- 3 letters of recommendation (submitted through online Graduate School application or mailed directly to Food Science)

*To the Food Science P (<http://foodscience.missouri.edu/graduate>) program:*

- Refer to the information at the link above

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. The food science program does not. Include the financial assistance request in the statement of purpose.

## PhD in Food Science

### Admission Contact Information

JoAnn Lewis ([lewisj@missouri.edu](mailto:lewisj@missouri.edu))  
256 William Stringer Wing  
Columbia, MO 65211-5160  
573-882-4113

### Admission Criteria

Fall deadline: April 1  
Spring deadline: October 31

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

Item	Score
IELTS	5.5

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	3.5
On or After August 1, 2011	297	3.5

- \* Note: neither the verbal or quantitative section can be below 400 or its equivalent score.

- Minimum GPA: 3.0
- BS and an MS in food science from an accredited university or equivalent experience. In rare instances, an exceptional student will be allowed to study for the PhD without first completing the MS

## About the PhD Program

The PhD degree can lead to careers in research, college or university teaching and research, or to administrative positions related to foods.

## Degree Requirements

Requiring a minimum of 2 years beyond the master's degree, the doctor of philosophy degree prepares students for teaching, research or other professional careers in food science. A student must:

- Satisfactorily complete the master's degree program or its equivalent with a GPA of 3.0 or better
- Satisfactorily complete the written and oral qualifying examination
- Show evidence of satisfactory performance in the major area of study, inclusive of grade trends and comply with other Graduate School requirements for admission.

## Plan of Study

The plan of study, completed under the guidance of a doctoral program committee, consists of:

- A course of study designed to fit the student's academic background and objectives — one-third of the credit earned under the plan of study is research credit, the remainder is in courses selected from food science and its supporting areas, such as chemistry, microbiology, physiology, nutrition, economics, marketing, management and statistics
- Acceptance of a dissertation based on research proposed, performed and defended by the student.

*To satisfy degree requirements, a candidate must:*

- prepare and defend a research proposal within the first two semesters; the proposal is designed to test the student's ability to undertake advanced learning and carry out independent research.
- complete the Plan of Study and defend the PhD project proposal
- pass the comprehensive examination over the approved course of study
- present an acceptable dissertation and defend it in a final examination
- present an exit seminar on research
- prepare at least 1 manuscript, acceptable for submission to a refereed journal, before approval of the D-4 (Report of the Dissertation Defense Form) by the director of graduate studies

## Forestry

H. E. Stelzer  
 Department of Forestry  
 The School of Natural Resources  
 College of Agriculture, Food and Natural Resources  
 203 Anheuser-Busch Natural Resources Building  
 (573) 882-7242  
 SNR@missouri.edu

The forestry undergraduate major is based on a foundation of communication, analytical science, humanities and professional courses that provides students with prerequisites for additional professional courses as well as a basic liberal education. Four emphasis areas are offered: forest resource management, urban forestry, forest resource entrepreneurship and business, and individualized studies.

The department offers a BSF degree in Forestry, MS and PhD degrees in Natural Resources with emphasis in Forestry. A minor is also available.

## Faculty

**Professor** H. S. He\*\*, S. Jose\*\*, D. R. Larsen#, M. J. Linit\*, R. M. Muzika\*\*, T. L. Payne\*

**Associate Professor** H. E. Stelzer\*\*

**Assistant Professor** F. X. Aguilar\*\*, J. A. Hubbard\*\*, B. O. Knapp\*

**Research Professor** M. A. Gold\*\*, R. P. Guyette\*\*

**Research Assistant Professor** M. V. Coggeshall\*, C. H. Lin\*\*, M. C. Stambaugh\*

**Cooperative Associate Professor** D. Dey\*, J. Van Sambeek\*\*, S. R. Shifley\*

**Adjunct Assistant Professor** J. Kabrick\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 70)
- BSF in Forestry (p. 71)
  - with emphasis in Forest Entrepreneurship and Business (p. 72)
  - with emphasis in Forest Resource Management (p. 72)
  - with emphasis in Individualized Studies (p. 73)
  - with emphasis in Urban Forestry (p. 73)
- Minor in Forestry (p. 74)

## Dual Major - Forestry/Fisheries and Wildlife

In addition to courses that satisfy university general education requirements (p. 18), students who plan to complete a dual major in fisheries and wildlife/forestry must complete the required fisheries and wildlife sciences, forestry, and elective options to reach 140 credits. The dual major does not allow for any general elective hours.

## Major Core Requirements

Science Core		
CHEM 1100	Atoms and Molecules with Lab	3
BIOCHM 2110	The Living World: Molecular Scale	3
CHEM 1320	College Chemistry I	4
Physics (select one)		2-5
PHYSICS 1210 College Physics I		
ATM_SC 1050 Introductory Meteorology		
GEOL 1100	Principles of Geology with Laboratory	
SOIL 2100 Introduction to Soils		
SOIL 2106	Soil Science Laboratory	
BIO_SC 1200 General Botany with Laboratory		
General Biology		5
F_W 1100 Introductory Zoology with Laboratory		
BIO_SC 1500 Introduction to Biological Systems with Laboratory		
Ecology (select one)		5
BIO_SC 3650 General Ecology		
FOREST 4320 Forest Ecology *		
Animal Form/Function course (select one)		4-5
MPP 3202 Elements of Physiology		
AN_SCI 3254 Physiology of Domestic Animals & AN_SCI and Physiology of Domestic Animals Laboratory 3255		
BIO_SC 3700 Animal Physiology		
BIO_SC 2300 Introduction to Cell Biology		
Genetics (select one)		3-4
F_W 2500 Introduction to Genetics and Evolution for Conservation		
BIO_SC 2200 General Genetics		
AN_SCI 3213 Genetics of Agricultural Plants and Animals		
Math Sequence		
MATH 1100	College Algebra	9
& MATH 1400 and Calculus for Social and Life Sciences I & STAT 2530 and Statistical Methods in Natural Resources		
Professional Core		
NAT_R 1070	Ecology and Renewable Resource Management	3
F_W 2100	Colloquium in Fisheries and Wildlife	1
FOREST 2151	Dendrology	4
Public Speaking (select one)		3
AG_ED 2220 Verbal Communication in Agriculture, Food and Natural Resources		
P_R_TR 3231 Principles of Interpretive Outdoor Recreation		
Law/Policy (select one)		3
AG_EC 2156 Introduction to Environmental Law		
AG_EC 3257 Rural and Agricultural Law		
NAT_R 4353 Natural Resource Policy/Administration		
Water Quality (select one)		3
F_W 3400 Water Quality and Natural Resource Management		
FOREST 4390 Watershed Management and Water Quality		
F_W 3600 Introduction to Conservation Biology		
FOREST 4330 Practice of Silviculture		

F_W 4500	Animal Population Dynamics and Management	
NAT_R 3110	Natural Resource Biometrics	
NAT_R 3290	Hydrologic Measurement Techniques	
CAPSTONE		
<b>Summer Field Studies (must be taken concurrently)</b>		<b>5</b>
FOREST 2541	Forest Utilization	1
FOREST 2542	Forest Measurement and Inventory	1
FOREST 2543	Forest Ecology Field Studies	1
FOREST 2544	Introduction to Silviculture and Management	1
FOREST 2545	Forest Management Planning	1
<b>Professional Track Courses</b>		
(Minimum of 10 courses AND 32 hours required)		32
<b>Fisheries and Wildlife Core - 5 courses minimum</b>		
A. Science and Natural History (must take at least 1 Terrestrial and 1 Aquatic. Only 1 outside F W)		
F_W 2600	Ornithology	
F_W 2700	Ichthyology	
F_W 3660	Mammalogy	
F_W 4100	Limnology	
BIO_SC 3360	Herpetology	
BIO_SC 3710	Introductory Entomology	
& BIO_SC 3715	and Insect Diversity	
B. Management - (must take at least 1 Terrestrial and 1 Aquatic)		
F_W 3900	Ecology of Fishes	
F_W 4300	Fisheries Management	
F_W 4400	Techniques for Fisheries Management and Conservation	
F_W 4600	Ecosystem Management	
F_W 4700	Wildlife Research and Management Evaluation Methods	
C. Specialty Courses (5th course can come from this list or from A or B)		
F_W 3200	Aquaculture	
F_W 4200	Urban Wildlife Conservation	
F_W 4220	Human Dimensions of Fish and Wildlife Conservation	
International Studies or Study Abroad [approved F W Proposal required]		1-8
<b>Forest Core - 15 credits minimum from the following courses (additional courses accepted with approval):</b>		
FOREST 3207	Forest Fire Control and Use	
FOREST 3212	Forest Health and Protection	
FOREST 3240	Wood Technology	
FOREST 3290	Urban Forestry	
FOREST 4320	Forest Ecology	
FOREST 4350	Forest Economics	
FOREST 4360	Photogrammetry, Inventory and Models	
FOREST 4375	Forest Stand Dynamics	
FOREST 4380	Forest Resource Management	
FOREST 4390	Watershed Management and Water Quality	

Total Credits

98-110

\* Required as a minimum for Forestry Certification if the accredited curriculum has not been completed.

## Graduate

School of Natural Resources  
 Department of Forestry  
 203 Anheuser-Busch Natural Resources Building  
 573-882-7242  
<http://snr.missouri.edu/forestry/academics/graduate-program.php>

**Director of Graduate Studies:** Hong He

- Graduate Certificate in Agroforestry (p. 74)

Forestry encompasses both basic and applied science, involving specific interests ranging from biophysical processes in forested ecosystems to plant population studies, but also recognizes overarching fundamental issues of sustainability of natural resources. Forestry graduate education prepares students for opportunities in a variety of disciplines such as forest ecology, tree physiology, hydrology, conservation, policy and silviculture.

## Degrees and Areas of Study

Graduate research programs in the Department of Forestry lead to an MS or PhD in forestry. Specialized graduate education can focus on, but is not limited to, studies in agroforestry, biometrics, community and landscape ecology, dendrochronology, economics, entomology, fire ecology, hydrology, physiological ecology, physiology, policy, silviculture, soils, forest management, stand dynamics, water quality and wood quality.

## Interdisciplinary Graduate Certificates

In collaboration with other departments, additional graduate certificates are available in  
 Conservation Biology <http://conservbio.missouri.edu/description.php>  
 Geographic Information Sciences <http://www.geog.missouri.edu/?q=grad/graduate-gis-program>.  
*Interdisciplinary certificates are intended for students who elect to take courses beyond those required for our graduate degrees.*

## Partnerships

The graduate program in the Department of Forestry involves partnerships with the USDA Forest Service, Northern Research Station, the Missouri Department of Conservation, the Missouri Department of Natural Resources, the US Geological Survey, the National Park Service and the United States Fish and Wildlife Service. Students may work closely with scientists in these agencies who have affiliated faculty appointments.

## Career Opportunities

A graduate degree in Forestry is designed to prepare students for careers in academic institutions, consulting firms, non-governmental organizations, industry and state and federal agencies.

## Facilities and Resources

Facilities available for research include well-equipped biometrics, ecology, dendrochronology, hydrology, physiology and wood quality laboratories in the Anheuser-Busch Natural Resources Building on

campus at Columbia, the Horticultural and Agroforestry Research Center (HARC) and the Baskett Research and Education Area.

Horticulture and Agroforestry Research Center (HARC). HARC is a 540-acre tract about 30 miles northwest of campus near New Franklin, Mo. It is in the loess hills overlooking the Missouri River Valley and is well-suited for agroforestry, agronomic and horticultural field studies.

Baskett Research Area. Thomas Baskett Wildlife Research and Education Area, formerly known as the Ashland Wildlife Research Area, is a 2,252-acre facility located five miles east of Ashland, Missouri. In use since 1938, Baskett has become an integral part of the School of Natural Resources mission of teaching, research, and extension. The Baskett Research Area is used as an outdoor laboratory for several classes including dendrology, forest ecology, ornithology, and wildlife research techniques, and has been the source of over 150 research publications. For more information see <http://www.aes.missouri.edu/baskett/>

Schnabel Woods. The Schnabel Arboretum Tract is an 80-acre tract of late-successional forest on the bluffs near the Missouri River. It is located eight miles southwest of the MU campus near the river community of McBaine, adjacent to the Missouri Department of Conservation Eagle Bluff Conservation Area and the cross-state Katy Trail State Park. The Schnabel Tract represents a unique, relatively undisturbed example of a river-hills forest ecosystem complex not commonly found in Missouri. The area is used for undergraduate instruction, graduate research and demonstration.

University Forest. University Forest is located at the southeastern edge of the Missouri Ozarks, 14 miles north of Poplar Bluff and near Lake Wappapello. It is uniquely situated at the junction of two major ecological sections of the state: The Ozarks and the Mississippi Alluvial Basin. Three forest ecosystem types converge near this area: upland oak-hickory, oak-shortleaf pine and bottomland hardwoods. Using the adjacent 7,000-acre University State Forest managed by the Missouri Department of Conservation, this area is used routinely by the faculty and students of the School of Natural Resources for research.

Additional Locations. In addition, lands of the United States Forest Service, United States Fish and Wildlife Service, Corps of Engineers, National Park Service, Missouri Department of Conservation and the Missouri Department of Natural Resources are available for certain research activities. Numerous research projects have also taken place on private lands.

## Funding

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details. A limited number of research assistantships are available. They are awarded based on (1.) demonstrated scholastic accomplishment; (2.) GRE scores; and (3.) experience related to the proposed field of study.

## Application and Admission Information

Admission Contact Information  
 Dr. Hong He  
 203 ABNR Bldg.  
 HeH@missouri.edu

## Admission Criteria

Fall deadline: May 15  
 Spring deadline: October 15

Summer deadline: March 15

- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1100
On or After August 1, 2011	300

\* 50th percentile or higher preferred in each category.

Particular attention is given to the record of the last 2 years of undergraduate study, and/or the type and quality of professional experience since completion of the undergraduate degree. Doctoral candidates must demonstrate a higher level of achievement in each of these criteria.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- 3 letters of recommendation from individuals qualified to evaluate scholarly capacity and professional qualities
- Letter of intent

*To the Program:*

- Departmental application (use form)
- GRE scores

## Undergraduate

### Department Level Requirements - Forestry

The forestry major requires the successful completion of 125 credits. In addition to the University graduation requirements, including general education, students must meet college and school as well as department and major requirements.

### Forestry Field Studies

Students enrolled in forestry are required to attend a specialized, five-week, summer field session in southeast Missouri. This session includes courses for 5 credits and is recommended between the sophomore and junior years.

### Honors

Students who graduate with the following cumulative GPA values are awarded BSF degrees with Latin honors:

3.50-3.69	cum laude
3.70-3.89	magna cum laude
>3.90	summa cum laude

## Emphasis Areas

Four emphasis areas are offered within the BSF degree program. Three of these areas (*forest resource management, urban forestry, and forest entrepreneurship and business*) represent areas of specialization within the forestry profession. The *individualized studies* emphasis area allows students to specialize in an allied area under the direction of a faculty committee.

## BSF in Forestry

### Major Program Requirements

The goal of the forest resource management emphasis area is to prepare students to deal with the ever-changing complexities of multiple-use resource management. Emphasis is on the applications of forest management to provide commodities and amenities in a sustainable fashion.

Graduates are qualified to develop and execute management plans in an environmentally safe, cost-efficient and effective manner at both the stand and the forest level. Graduates are prepared to enter the workforce in either the public or the private sector. Courses listed are in addition to university, college, Department Level (p. 70) and forestry major requirements.

<b>University Core Requirements</b>	<b>33</b>
MATH 1100 College Algebra	3
ENGLSH 1000 Exposition and Argumentation	3
MATH 1400 Calculus for Social and Life Sciences I	3
CHEM 1100 Atoms and Molecules with Lab	3
BIOCHM 2110 The Living World: Molecular Scale	3
State Law Requirement: One of the following:	
HIST 1100 Survey of American History to 1865	3
or HIST 1200 Survey of American History Since 1865	
or POL_SC 1100 American Government	
AG Econ Requirement: One of the following:	
AG_EC 1041 Applied Microeconomics	3
or AG_EC 1042 Applied Macroeconomics	
or AG_EC 2070 Environmental Economics and Policy	
P_R_TR 3231 Principles of Interpretive Outdoor Recreation	3
Humanities and Fine Arts Electives	9
<b>Departmental Core Science</b>	<b>15-18</b>
BIO_SC 1200 General Botany with Laboratory	3-5
or PLNT_S 2110 Plant Growth and Culture	
GEOL 1100 Principles of Geology with Laboratory	4
or GEOL 1200 Environmental Geology with Laboratory	
SOIL 2100 Introduction to Soils	3
& SOIL 2106 and Soil Science Laboratory	
PHYSICS 1210 College Physics I	3-4
or ATM_SC 1050 Introductory Meteorology	
<b>Departmental Core Professional</b>	<b>34</b>
NAT_R 1070 Ecology and Renewable Resource Management	3
STAT 2530 Statistical Methods in Natural Resources	3
NAT_R 3110 Natural Resource Biometrics	3
NAT_R 3290 Hydrologic Measurement Techniques	1

NAT_R 4353 Natural Resource Policy/Administration	3
FOREST 2151 Dendrology	4
FOREST 4320 Forest Ecology	5
FOREST 4330 Practice of Silviculture	3
NAT_R 4325 Introduction to Geographic Information Systems	3
FOREST 4390 Watershed Management and Water Quality	3
Senior Forestry Capstone Course choose One of the following options	3
FOREST 4380 Forest Resource Management	3
FOREST 4940 Forestry Internship	1-12
FOREST 4994 Senior Honors Research in Forestry	1-3
FOREST 4995 Senior Honors Research in Forestry	1-3

Note: If Forestry 4380 is Not taken as the capstone, it Must be taken if the student is enrolled in the Forest Resource Management or Forest Resource Entrepreneurship emphasis area

<b>Departmental Core Summer Field Studies</b>	<b>5</b>
FOREST 2541 Forest Utilization	1
FOREST 2542 Forest Measurement and Inventory	1
FOREST 2543 Forest Ecology Field Studies	1
FOREST 2544 Introduction to Silviculture and Management	1
FOREST 2545 Forest Management Planning	1

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
ATM_SC 1050	3	AG_EC 1041	3		
BIO_SC 1200	5	CHEM 1100	3		
ENGLSH 1000	3	NAT_R 1070	3		
MATH 1100	3	GEOL 1100	4		
		History or Political Science	3		
	14		16		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
FOREST 2151	4	FOREST 3212	4	FOREST 2541	1
FOREST 3207	2	STAT 2530	3	FOREST 2542	1
FOREST 3240	3	SOIL 2100	3	FOREST 2543	1
BIOCHM 2110	3	SOIL 2106	2	FOREST 2544	1
MATH 1400	3	Humanities Elective	3	FOREST 2545	1
	15		15		5

Third Year			
Fall	Credits	Spring	Credits
FOREST 4320	5	FOREST 4330	3
NAT_R 3110	3	NAT_R 4353	3
FOREST 4360	3	P_R_TR 3231	3
FOREST 4340	3	FOREST 4350	3
Humanities Elective	3	Humanities Elective	3
	17		15
Fourth Year			
Fall	Credits	Spring	Credits
FOREST 4390	3	NAT_R 4970	3
FOREST 4380	3	Social Science Elective	3
F_W 4600	4	Additional Electives	8
NAT_R 3290	1		
Additional Electives	6		
	17		14
Total Credits: 128			

## BSF in Forestry with Emphasis in Forest Entrepreneurship and Business

### Major Program Requirements

The goal of forest resource entrepreneurship and business is to prepare graduates for work with large wood products firms, or as independent private consulting foresters. Courses listed are in addition to University general education (p. 18) requirements, Department Level Requirements (p. 70), and forestry major requirements.

MANGMT 3000	Principles of Management	3
ACCTCY 2036	Accounting I	3
FOREST 4350	Forest Economics	3
FOREST 4365	Logging Systems: Operations and Analyses	3
FOREST 4380	Forest Resource Management	3
Internship in Forest Resource Business Administration (TBD - Problems course)		6
<b>Minor: Agricultural Economics</b>		<b>21</b>
AG_EC 1041	Applied Microeconomics	
AG_EC 2183	The Agricultural Marketing System	
AG_EC 3282	Agribusiness Finance	
AG_EC 3283	Fundamentals of Entrepreneurship	
AG_EC 3224	New Products Marketing	
AG_EC 3286	Economics of Managerial Decision Making	
or AG_EC 3230	Agricultural and Rural Economic Policy	

AG\_EC 3257 Rural and Agricultural Law  
or AG\_EC 3256 Agribusiness and Biotechnology Law

If Forestry 4380 is selected as the capstone course then another Forestry course must be added to fulfill emphasis requirement.

### Semester Plan

Refer to the Semester Plan for the BS in Forestry (p. 71).

## BSF in Forestry with Emphasis in Forest Resource Management

### Major Program Requirements

Courses listed are in addition to the University General Education (p. 18) requirements, Department Level Requirements (p. 70), and forestry major requirements.

### Emphasis Core Requirements

FOREST 3212	Forest Health and Protection	4
FOREST 3207	Forest Fire Control and Use	2
FOREST 3240	Wood Technology	3
FOREST 4340	Tree Physiology	3
or PLNT_S 2125	Plant Structure and Function	
or PLNT_S 4315	Crop Physiology	
or PLNT_S 4320	Plant Physiology	
FOREST 4360	Photogrammetry, Inventory and Models	3
FOREST 4380	Forest Resource Management	3
FOREST 4350	Forest Economics	3
F_W 4600	Ecosystem Management	4
<b>Undesignated electives to total 125 hours</b>		<b>100</b>

If Forestry 4380 is selected as the capstone course, then another Forestry course must be added to fulfill emphasis requirements.

Total Credits 125

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
State Law Course*	3	AG_EC 1041*	3
BIO_SC 1200^	5	NAT_R 1070^	3
Soc Sci Elective	3	GEOL 1100 or 1200^	4
ENGLSH 1000*	3	MATH 1100*	3



		Humanities Elective*	3		
	14			16	
<b>Second Year</b>					
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>	<b>Summer</b>	<b>Credits</b>
FOREST 2151 <sup>^</sup>	4	SOIL 2100 <sup>^</sup>	3	FOREST 2540 <sup>^</sup>	1
FOREST 3207 <sup>^</sup>	2	SOIL 2106 <sup>^</sup>	2	FOREST 2541 <sup>^</sup>	1
CHEM 1100*	3	BIOCHM 2110*	3	FOREST 2542 <sup>^</sup>	1
MATH 1400*	3	STAT 2530 <sup>^</sup>	3	FOREST 2543 <sup>^</sup>	1
Humanities Elective*	3	ATM_SC 1050 <sup>^</sup>	3	FOREST 2544 <sup>^</sup>	1
		Humanities Elective*	3	FOREST 2545 <sup>^</sup>	1
	15		17		6
<b>Third Year</b>					
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>		
FOREST 4320 <sup>^</sup>	5	FOREST 3212 <sup>^</sup>	4		
FOREST 4340 <sup>^</sup>	3	FOREST 4330 <sup>^</sup>	3		
FOREST 4360 <sup>^</sup>	3	FOREST 4350 <sup>^</sup>	3		
NAT_R 3110 <sup>^</sup>	3	NAT_R 4353 <sup>^</sup>	3		
FOREST 3240 <sup>^</sup>	3	P_R_TR 3231 <sup>^</sup>	3		
	17		16		
<b>Fourth Year</b>					
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>		
FOREST 4390 <sup>^</sup>	3	NAT_R 4970 <sup>^</sup>	3		
FOREST 4380 <sup>^</sup>	3	NAT_R 4325 <sup>^</sup>	3		
F_W 4600 <sup>^</sup>	4	Electives	6		
Electives	3				
	13		12		
Total Credits: 126					

\* Denotes General Education Requirement

<sup>^</sup> Denotes Degree Program Requirement

## BSF in Forestry with Emphasis in Individualized Studies

### Major Program Requirements

This emphasis area allows students with interests in both forestry and an allied field to obtain a degree in forestry combined with a customized specialization in a field of interest. The allied field can be wildlife biology

and management, ecology, environmental science, environmental studies, interpretation of natural resources, environmental law, soils or others.

The individualized study program requires completion of 27 credits to be determined by the student and a three-member faculty committee, two of whom must be forestry faculty. Courses listed are in addition to university general education (p. 18) requirements, Department Level Requirements (p. 70) and forestry major requirements.

#### Emphasis core requirements (27+)

Individualized study program	27
<b>Undesignated electives to total 125 hours</b>	<b>98</b>
<b>Total Credits</b>	<b>125</b>

### Semester Plan

Refer to the Semester Plan for the BSF in Forestry (p. 71).

## BSF in Forestry with Emphasis in Urban Forestry

### Major Program Requirements

Urban forestry seeks the maintenance of vigorous and aesthetic tree systems that enhance urban and suburban environments. The responsibility of the urban forester is to establish, develop and administer tree management systems for metropolitan areas and other population centers.

Students in urban forestry learn communications and public relations skills as well as mid-level management procedures that prepare them to organize, staff, finance, plan and supervise urban forestry programs. Courses in management, administrative strategies and scientific foundations are incorporated into the urban forestry curriculum. Courses listed are in addition to University, college, Department Level Requirements (p. 70) and forestry major requirements.

#### Emphasis core requirements

FOREST 3212	Forest Health and Protection	4
FOREST 3290	Urban Forestry	2
FOREST 4340	Tree Physiology	3
or PLNT_S 2125	Plant Structure and Function	
or PLNT_S 4315	Crop Physiology	
or PLNT_S 4320	Plant Physiology	
PLNT_S 2210	Ornamental Woody Plants	3
PLNT_S 3230	Plant Propagation	3
PLNT_S 2254	Landscape Design	3
PLNT_S 4350	Nursery Crop Production and Management	4
<b>Undesignated electives to total 125 hours</b>		<b>103</b>
<b>Total Credits</b>		<b>125</b>

### Semester Plan

Refer to the Semester Plan for the BSF in Forestry (p. 71).

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## Minor in Forestry

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A minor in forestry requires 15 credits in the forestry major (forestry requirements and emphasis areas).

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## Graduate

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## Graduate Certificate in Agroforestry

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The program is built on the biophysical and socioeconomic principles of agroforestry which will prepare students to become specialized in agroforestry design and management. The knowledge and experience in designing and managing agroforestry systems for commodity production as well as environmental conservation are skill sets needed to work as agroforestry and forestry consultants and conservation and natural resource professionals. The curriculum leads the student through a progression of learning to achieve (A) Agroforestry Fundamentals; (B) Biophysical Foundation; and (C) Socio-economic Foundation. Successful required course completion will be recorded on the student's official transcript as a "Graduate Certificate in Agroforestry."

Certificate web site: <http://www.snr.missouri.edu/forestry/academics/graduate-program.php>

For information about certificate, contact:

Dr. Shibu Jose,

Department of Forestry, School of Natural Resources

203 Anheuser-Busch Natural Resources Building

University of Missouri, Columbia, MO 65211

email: [musnrforestry@missouri.edu](mailto:musnrforestry@missouri.edu)

(573) 882-7045

# Hospitality Management

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The curriculum leading to the BS in Hospitality Management educates students for leadership in the global hospitality industry. The program has a food-service facility that houses demonstration kitchens, a multi-purpose dining room that plays host to the student-run Café at Eckles Hall, and a weekly fine dining evening experience. The program cooperates with the college in operating the Gathering Place Bed and Breakfast which serves as a training operation for lodging management and conference and event planning management students.

## Faculty

**Associate Professor** S. Cho\*, J. Groves\*, D. Kim\*  
**Assistant Teaching Professor** L. Hatfield\*, L. Jett\*  
**Instructor** A. Alexander, J. Guinn

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 75)
- BS in Hospitality Management (p. 75)
  - with emphasis in Conference and Event Planning Management (p. 76)
  - with emphasis in Food and Beverage Management (p. 77)
  - with emphasis in Lodging Management (p. 77)
  - with emphasis in Sport Venue Management (p. 77)
- Minor in Hospitality Management (p. 77)

## What you can do with a degree in Hospitality Management

Students selecting a major in Hospitality Management are required to take a wide variety of courses that provide basic knowledge of human understanding, a theoretical knowledge of basic business principles, and an understanding of business principles as applied in the hospitality industry. Students further select an emphasis area which provides them more in-depth knowledge of leadership application in a Hospitality career area. In addition, each student completes a 15 hour block of professional electives which allows them to gain additional expertise.

Students choose an emphasis in Conference and Event Planning, Food and Beverage Management, Lodging Management, or Sport Venue Management. In the Conference and Event Planning Management emphasis, students develop knowledge and skills in planning and

conducting a large variety of events from wedding, to small business meetings, to routine events that occur on a regular basis, to large one-time events. Students with this emphasis find employment in a variety of businesses, hotels, associations, and private event companies.

Students choosing the Food and Beverage Management emphasis acquire skills and knowledge in managing a variety of food and beverage operations both small and large scale. These students find employment in a variety of restaurants, lodging food operations, and catering venues. Many students in this area go on to own their own restaurant operations.

Students choosing the Lodging Management emphasis acquire skills and knowledge in managing a variety of lodging operations from mega resorts with thousands of hotel rooms, to small inns or bed and breakfast operations. These students find employment in small, medium, and large lodging operations. Some will go on to own and operate their own Bed and Breakfast operation.

Students choosing the Sport Venue Management emphasis acquire skills and knowledge in managing a variety of conference and events centers that have sports as one of their operations. These students will be qualified to operate large and small venues that cater to sports teams, concerts, and a variety of other functions. This is a good emphasis area for a student who wants to stay connected to the world of sports.

## Graduate

While MU does not offer graduate degrees specifically in hospitality management, the University does offer post-baccalaureate opportunities in a number of related areas, both within the College of Agriculture, Food and Natural Resources, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

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## Department Level Requirements - Hospitality Management

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A grade of C- or higher is required for all hospitality core, emphasis area, and professional elective courses.

Please see the BS in Hospitality Management (p. 75) page for the major program requirements.

## BS in Hospitality Management

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### Major core requirements

Students must complete all university general education (p. 18) requirements, college requirements (p. 31), and department level requirements (p. 75) in addition to the major program requirements below:

#### Degree core requirements

Psychology or Sociology	3
<b>Business</b>	
Accounting	3
Leadership	3
Finance	3

Management		3
Marketing		3
Business Elective		3
<b>Hospitality Management Core</b>		
HSP_MGMT 1043	Introduction to Hospitality Management	3
HSP_MGMT 1133	Hospitality Law	3
HSP_MGMT 4191	Seminar in Professional Development	1
HSP_MGMT 4253	Hospitality Human Resources Management	3
HSP_MGMT 4273	Hospitality Sales and Marketing Management	3
HSP_MGMT 4941	Internship in Hospitality Management	3
Total Credits		37

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
BIO_SC 1010	3	CHEM 1100	3
AG_EC 1041	3	AG_EC 1042	3
HSP_MGMT 1043	3	State Law Course	3
AG_EC 1041	3	Communication	3
MATH 1100	3	Humanities	3
Social Science	3		
	18		15
Second Year			
Fall	Credits	Spring	Credits
Approved Physical Science, Biological Science, or Math	3	BIO_SC 1020	2
Humanities	3	Math Reasoning Proficiency	3
AG_ED 2250 or 2260	3	FINANC 2000	3
HSP_MGMT 1133	3	Emphasis Area Course	3
ENGLISH 1000	3	Unrestricted Elective	3
		HSP_MGMT 4191	1
	15		15

Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
ACCTCY 2010 or 2036	3	MNGMT 2000	3	HSP_MGMT 4941	1-12
MRKTNG 3000	3	Professional Elective	3		
Communication Elective	3	Emphasis Area Course	3		
Emphasis Area Course	3	HSP_MGMT 4253	3		
Professional Elective	3	Emphasis Area Course	3		
	15		15		1-12
Fourth Year					
Fall	Credits	Spring	Credits		
Professional Elective	3	Professional Elective	3		
Professional Elective	3	Professional Elective	3		
Unrestricted Elective	3	Emphasis Area Course	3		
HSP_MGMT 4273	3	Emphasis Area Course	3		
Emphasis Area Course	3				
	15		12		
Total Credits: 121-132					

## BS in Hospitality Management with Emphasis in Conference and Event Planning Management

### Major Program Requirements

Students must complete all university general education (p. 18) requirements, college requirements (p. 31), and department level requirements (p. 75) in addition to the major program requirements below:

HSP_MGMT 3153	Food Service Operations Management	3
or HSP_MGMT 4353	Hotel Finance Management	
HSP_MGMT 3410	Conference and Meeting Management	3
HSP_MGMT 3415	Current Issues in Meeting and Event Management	1
HSP_MGMT 4320	Destination Management	3
HSP_MGMT 4980	Special Events Management	3
Hospitality Professional Electives		15
Total Credits		28

## Semester Plan

Refer to the Semester Plan for the BS in Hospitality Management (p. 75).

### BS in Hospitality Management with Emphasis in Food and Beverage Management

#### Major Program Requirements

Students must complete all university general education requirements, college requirements, and department level requirements (p. 75) in addition to the major program requirements below:

HSP_MGMT 1991	Food Service Sanitation Management	1
HSP_MGMT 1995	Culinary Fundamentals	3
HSP_MGMT 2123	Food Service Operational Fundamentals	2
HSP_MGMT 2143	Introduction to Food Production and Service Fundamental	2
HSP_MGMT 3153	Food Service Operations Management	3
HSP_MGMT 4985	Commercial Food Production Management	5
Hospitality Professional Electives		15
Total Credits		31

## Semester Plan

Refer to the Semester Plan for the BS in Hospitality Management (p. 75).

### BS in Hospitality Management with Emphasis in Lodging Management

#### Major Program Requirements

Students must complete all university general education requirements (p. 18), college requirements (p. 31), and department level requirements (p. 75) in addition to the major program requirements below:

HSP_MGMT 3343	Hotel Operations and Management	3
HSP_MGMT 4343	International Hotel Management	3
HSP_MGMT 4353	Hotel Finance Management	3
HSP_MGMT 4994	Lodging Management Leadership	3
Hospitality Professional Electives		15
Total Credits		27

## Semester Plan

Refer to the Semester Plan for the BS in Hospitality Management (p. 75).

### BS in Hospitality Management with Emphasis in Sport Venue Management

#### Major Program Requirements

Students must complete all university general education (p. 18) requirements, college requirements (p. 31), and department level requirements (p. 75) in addition to the major program requirements below:

HSP_MGMT 1505	Fundamentals of Sport Venue Management	3
HSP_MGMT 2550	Practicum in Sport Venue Management	3
HSP_MGMT 3510	Guest Service Management: Delivering the Fan Experience	3
HSP_MGMT 3515	Sport Venue Operation Management	3
HSP_MGMT 4520	The Business of Sport Venue Management	3
HSP_MGMT 4525	Sport Venue Design and Risk Management	3
Hospitality Professional Electives		15
Total Credits		33

## Semester Plan

Refer to the Semester Plan for the BS in Hospitality Management (p. 75).

### Minor in Hospitality Management

A minor in Hospitality Management may be earned by completing:

#### Minor Course Requirements:

HSP_MGMT 1043	Introduction to Hospitality Management	3
HSP_MGMT 1505	Fundamentals of Sport Venue Management	3
HSP_MGMT 3153	Food Service Operations Management	3
HSP_MGMT 3343	Hotel Operations and Management	3
HSP_MGMT 3410	Conference and Meeting Management	3
A HSP_MGMT elective at 3000 or above		3
Total Credits		18

## Natural Resources

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### School of Natural Resources

The School of Natural Resources is Missouri's and the Midwest's only school with a comprehensive natural resources program. It is a division of the College of Agriculture, Food and Natural Resources. It encompasses atmospheric sciences, environmental science, fisheries, forestry, parks, recreation, soils, tourism and wildlife. The school is based on an integrated, scientific approach to natural resources management. It is housed in the Anheuser-Busch Natural Resources Building containing state-of-the-art teaching, research and outreach extension facilities.

The Department of Forestry was established at MU in 1947 and was elevated to the status of School of Forestry in 1957. The fisheries and wildlife program, which was established in 1937 in the College of Arts and Science, became part of the school in 1973. The Department of Parks, Recreation and Tourism was added in 1988. The School of Natural Resources was formed through a name change in 1989. A Department of Soils was formed at MU in 1914 and a Department of Atmospheric Science was formed in 1966. Faculties in soil science and atmospheric science joined The School of Natural Resources in 1990 and 1991, respectively, and were merged into the Department of Soil and Atmospheric Sciences in 1992. This name was changed to the Department of Soil, Environmental and Atmospheric Sciences in 2004. With approximately 500 undergraduates and 50 faculty members, the school is noted for excellent education, strong professional orientation, active student organizations and outstanding advising.

### Faculty

Faculty members within the School of Natural Resources have their appointments through the following degree programs: Forestry (p. 68), Fisheries & Wildlife (p. 60), Parks, Recreation & Tourism (p. 94), Soil, Environmental & Atmospheric Science (p. 112). Their faculty listing can be found on those degree pages.

### Undergraduate

- Minor in Natural Resources (p. 79)

While the College of Agriculture, Food and Natural Resources does not offer a baccalaureate degree in Natural Resources, it does offer degrees in specialized areas within Natural Resources, such as Fisheries and Wildlife (p. 60); Forestry (p. 68); Parks, Recreation and Tourism (p. 94); and Soils, Environmental and Atmospheric Sciences (p. 112).

## Admissions

In addition to requirements listed below, students admitted to the University of Missouri may enter The School of Natural Resources as freshmen or as transfer students.

### Transfer Students

Previous college work is carefully evaluated by The School of Natural Resources. Courses are readily accepted if they are satisfactory substitutes for required University of Missouri courses. Lists of acceptable substitute courses offered at many other institutions are maintained and are available to prospective transfer students on request.

## Major Program Requirements

Students must meet all emphasis, major, degree, department, college and university graduation requirements, including the university general education requirements. See the appropriate sections of this catalog.

## Academic Assessment

### Field Assessment

This assessment is required by the Missouri Coordinating Board for Higher Education (CBHE). In The School of Natural Resources, it consists of an unstructured evaluation of each student's competencies based on performance in a capstone course. For students in fisheries and wildlife, forestry, soil research management, environmental soil science, environmental science, and natural resources recreation management in NAT\_R 4970 Resource Practicum in Natural Resources, interdisciplinary teams develop and defend a comprehensive resource management plan before a panel of The School of Natural Resources professors and several resource management agency professionals. All students in parks, recreation and tourism are assessed during their required internship experience (P\_R\_TR 4940 Parks, Recreation and Tourism Internship). Students in atmospheric science are assessed in ATM\_SC 4990 Daily Analysis and Forecast Interpretation.

### Capstone Options

Within the last 45 credits, but usually during the senior year, students must take a capstone course or be involved in a capstone project. This project is an academic activity that integrates general knowledge with the specialized knowledge each student has developed in the major area and, when appropriate, the related field (minor). In the atmospheric sciences curriculum, the capstone course is ATM\_SC 4990 Daily Analysis and Forecast Interpretation (3 s.h.). Fisheries and wildlife, forestry, and soils curricula utilize NAT\_R 4970 Resource Practicum in Natural Resources (3 s.h.). This course is also taken by most parks, recreation and tourism students in the natural resource recreation management emphasis area, although it does not serve as their formal capstone experience. The parks, recreation and tourism curriculum utilizes P\_R\_TR 4940 Parks, Recreation and Tourism Internship (12 s.h.) as the capstone experience.

### Credits by Examination

A total of 21 credits in CLEP (College Level Entrance Program) is accepted in the following areas: English, mathematics, social sciences and humanities. The school does not accept natural science CLEP credit.

## Student Services

### Advising

Personalized advisement and counseling is available from the school's faculty members. An open-door policy by advisors is emphasized and

the school is noted for excellent student/faculty relations. Undergraduate advisement in The School of Natural Resources (SNR) is undertaken by those faculty and staff who advise with the attitude of fostering academic and professional development and success. The faculty members recognize the importance of establishing a trust relationship with students that will extend through their academic years at MU into their careers.

#### Career Placement

Students in The School of Natural Resources are provided various types of employment assistance through the College of Agriculture, Food and Natural Resources Placement Office (2-64 Agriculture Building). Resource materials on potential employers are available for student use. Instructions regarding federal, state and industrial employment procedures and assistance in the preparation of resumes and applications also are available. Notices of available positions are posted, and interviews are arranged with visiting organizations. Employment assistance also is given to alumni of the school on request.

#### Freshman Interest Groups

Freshman Interest Groups (FIGs) are sponsored by the school in four areas, atmospheric sciences ("Storm Chasers"), environmental science, natural resources and sport management. A learning community is also sponsored, comprised of members of the two FIGs and other students who live on the same dormitory floor. The FIG experience promotes a sense of community among students that increases the quality of all aspects of university life for incoming students.

#### Transfer Student Interest Groups

TRIGS, or Transfer Interest Groups, involve activities that are specifically designed to help transfer students make a smooth transition to the MU campus. The School of Natural Resources TRIG is composed of transfer students with common interests and majors. In addition to other activities, members of each TRIG take a 1 credit hour proseminar together during their first semester at MU. You do not need to live on campus to participate in a TRIG program. TRIGs are only open to transfer students who have completed 24 or more hours at their previous institution. There is no additional cost for participating in a TRIG, and they are a great way to get to know campus and meet other students who are also making the same transition. TRIGs are available only for students planning to start at MU in the fall term.

## Graduate

- MS in Natural Resources (p. 79)
  - with emphasis in Agroforestry (p. 79)
  - with emphasis in Fisheries & Wildlife Sciences (p. 81)
  - with emphasis in Forestry (p. 81)
  - with emphasis in Human Dimensions of Natural Resources (p. 82)
  - with emphasis in Parks, Recreation and Tourism (p. 83)
  - with emphasis in Soil, Environmental and Atmospheric Sciences (p. 84)
  - with emphasis in Water Resources (p. 86)
- PhD in Natural Resources (p. 88)
  - with emphasis in Fisheries & Wildlife Sciences (p. 88)
  - with emphasis in Forestry (p. 89)
  - with emphasis in Human Dimensions of Natural Resources (p. 89)

- with emphasis in Soil, Environmental and Atmospheric Sciences (p. 90)
- with emphasis in Water Resources (p. 91)

## Undergraduate

### Minor in Natural Resources

The natural resources minor requires that students select no more than 6 credits from a prearranged list of lower-division courses. The student also must select three additional upper-division courses, totaling at least 9 credits, from any curriculum within The School of Natural Resources.

## Graduate

### MS in Natural Resources

The MS in Natural Resources has emphasis areas in Agroforestry (p. 79), Fisheries & Wildlife Science (p. 81), Forestry (p. 81), Human Dimensions of Natural Resources (p. 82), Parks Recreation and Tourism (p. 83), Soil, Environmental and Atmospheric Sciences (p. 84), and Water Resources (p. 86). Please see the individual emphasis area pages for degree requirements and admissions information.

### MS in Natural Resources with emphasis in Agroforestry

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Columbia, MO 65211  
joses@missouri.edu  
573-882-0240

### Emphasis Area Focus

Agroforestry, as a farming system that integrates crops and/or livestock with trees and shrubs, has a long history of interdisciplinary research at the University of Missouri. The interdisciplinary emphasis area capitalizes on existing agroforestry research collaborations across The School of Natural Resources (SNR) departments in building an academic program that could attract and serve quality graduate students from Missouri, the nation and the world. The agroforestry emphasis area offers both a thesis and non-thesis option. The program also offers an online option designed for professionals working in natural resources around the globe who already have an undergraduate degree in a related field. Please visit the online webpage for more information: <http://online.missouri.edu/degreeprograms/agroforestry/index.aspx>

### Admission Requirements

- Bachelor's degree in a relevant discipline from an accredited institution
- Undergraduate GPA: 3.0 on a scale of 4.0
- Graduate Record Exam score (GRE)\*: verbal plus quantitative total of at least 1100 (300 on the new GRE)
- Students whose GPAs and GRE scores do not meet the requirements will be evaluated individually

\*The GRE requirement may be waived under exceptional circumstances. Applicants will be reviewed on a case-by-case basis.

## How to Apply

To the Graduate School:

- All application materials must be submitted to the Apply Yourself online application system.
- Statement of interest
- Résumé or CV
- GRE scores
- TOEFL scores (if applicable)
- A minimum of three letters of recommendation and the accompanying evaluation sheets from people who can attest to the candidate's scholastic ability and experience relevant to graduate study.
- Publications (optional)

## Application Deadlines

Applications must be received by the following dates:

- March 15 for the summer semester
- May 15 for the fall semester
- Oct. 15 for the spring semester

### Thesis option:

Students in the thesis option will complete 30 credit hours of course work with no more than 12 credits for thesis research. Students choosing the M.S. thesis option will prepare a written research proposal and make an oral defense of that proposal within 12 months of their initial enrollment in the program. Students in the thesis option will write a thesis based on their research and participate in a public oral defense of their thesis announced at least two weeks prior to the defense date.

### Non-Thesis option:

Students in the non-thesis option will complete 30 credit hours of course work with no more than 6 credits for a project. Students choosing the non-thesis option will be required to write a project plan and to make an oral defense of that plan within the first year following their initial enrollment in the program. Students choosing the non-thesis option will write a technical report based on their project and participate in a public oral defense of their report to be announced at least two weeks prior to the defense.

## Timeline Requirements:

1. Within six month of initial enrollment in the emphasis area, students must submit a plan of study.
2. Within one year of initial enrollment in the emphasis area, students must present a written proposal of their research or project proposal to be reviewed and approved by members of the students' Masters Committee.
3. Students will submit a written thesis or project report following the guidelines specified by the Graduate School. All students must present a public oral defense of their dissertation or project announced at least two weeks prior to the defense date. Electronic media may be used to facilitate the defense for online/distance education students when appropriate.
4. All students will submit an annual report of their progress as required by the MU Graduate School.

## Agroforestry Emphasis Area Coursework Requirements

Students seeking the agroforestry graduate emphasis will develop their course of study to incorporate 12 hours of a core curriculum of designated courses. This has been designed to include theoretical foundations in both the biophysical and socioeconomic components of agroforestry. The curriculum leads the student through a progression of learning and applying concepts related to (A) Agroforestry Fundamentals; (B) Biophysical Foundation; and (C) Socio-economic Foundation (Table 1).

Each student's coursework requirements, including the selection of specific courses in the above categories, will be listed in the student's plan of study and approved by their graduate committee.

**Table 1. The 12-cr core curriculum for the Agroforestry Emphasis M.S. program**

### A. Agroforestry Fundamentals

FOREST 4385/7385	Agroforestry I: Theory, Practice and Adoption	3
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### B. Biophysical Foundation

Choose Two		
FOREST 8385	Ecological Principles of Agroforestry	3
ENV_SC 4396/7396	Agroforestry for Watershed Restoration	3
NAT_R 7325	Introduction to Geographic Information Systems	3
FOREST 4390/7390	Watershed Management and Water Quality	3
SOIL 4313/7313	Soil Fertility and Plant Nutrition	3
ENV_SC 7320	Hydrologic and Water Quality Modeling	3
FOREST 8401	Topics in Forestry	1-99

### C. Sociol-economic Foundation

Choose one		
FOREST 4387	Agroforestry Economics and Policy	3
NAT_R 4353/7353	Natural Resource Policy/Administration	3

## Faculty membership of the graduate Agroforestry Emphasis Area

Faculty Name	Department
Aguilar, Francisco, Assistant Professor	Forestry
Anderson, Steve, Professor	SEAS
Coggeshall, Mark, Assistant Research Professor	Forestry
Gantzer, Clark, Professor	SEAS
Gold, Michael, Research Professor	Forestry
Goyne, Keith, Assistant Professor	SEAS
Jose, Shibu, Director/Professor	Forestry
Larsen, David, Professor	Forestry
Lin, Chung Ho, Research Assistant Professor	Forestry
Miles, Randy, Professor	SEAS
Motavalli, Peter, Associate Professor	SEAS



Muzika, Rose-Marie, Professor Forestry  
 Stelzer, Hank, Associate Professor Forestry  
 Udawatta, Ranjith, Associate SEAS  
 Research Professor

## MS in Natural Resources with emphasis in Fisheries and Wildlife Sciences

### Application and Admission Information

Admission Contact Information  
 Graduate Secretary  
 302 Anheuser-Busch Natural Resources Building; Columbia, MO 65211  
 Janice Faaborg; faaborgje@missouri.edu; 573-882-9422 or Karen Decker; deckerkf@missouri.edu; 573-882-3436

### Admission Criteria

Fall deadline: Rolling

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	
On or After August 1, 2011	1100 equivalent scores	

- Minimum GPA: 3.2 in last 60 hours of undergraduate coursework.
- Experience in research or management of natural resources. Practical skills are strongly considered.

### Required Application Materials

To the Graduate School:

- All application materials must be submitted to the Apply Yourself online application system
- All required Graduate School documents
- A minimum of three letters of recommendation and the accompanying evaluation sheets from people who can attest to the candidate's scholastic and conservation field work abilities
- Departmental application
- Written response to 1 of 5 questions listed on the Fisheries and Wildlife Sciences Graduate Program Admissions page
- GRE scores
- TOEFL scores (when applicable)
- Publications (optional)
- Resumé or CV

We require applicants to contact specific faculty to determine the availability of research assistantships prior to applying to the program.

An applicant contemplating graduate work in fisheries, limnology, conservation biology, or wildlife should have a strong background in biological and physical sciences, including biology, botany, zoology, ecology, physiology, and genetics. In addition, such taxonomic courses

as plant taxonomy, invertebrate zoology, ichthyology, ornithology, and mammalogy are highly desirable, as is a background in chemistry, mathematics, statistics, and physics.

A background of 25 to 30 hours in biological sciences courses is desirable. Minor deficiencies may be remedied during the graduate program; major deficiencies may require preparatory coursework prior to consideration for admission.

Fisheries and Wildlife Sciences degrees emphasize resource management at organismal, population, or ecosystem scales. An emphasis on resource management helps distinguish our program from basic biology; therefore, course work in fisheries or wildlife management, environmental science, resource policy, or other applied ecology fields is advantageous.

### Degree Completion Requirements

Master's students must complete, with a B average or better, a minimum of 30 hours of course work (15 hours or more at the 8000 course level). Research, problems, special investigations, and special readings courses shall not exceed 12 of the 30 hours.

### Plan of Study

Candidates are expected to design and have approved by their committee a plan of study during their first semester in residence and a thesis proposal by their second semester.

### Thesis & Oral Examination

A thesis acceptable to the student's graduate committee shall be completed and defended in a final oral examination; all candidates must complete the oral examination and a final thesis seminar before the degree is conferred.

## MS in Natural Resources with emphasis in Forestry

Admission Contact Information

Dr. Stephen G. Pallardy  
 203 ABNR Bldg.  
 PallardyS@missouri.edu

### Master of Science in Forestry

The master's degree in forestry is designed for students with an undergraduate degree in forestry or in one of the biological, physical or social sciences basic to forestry. The MS degree may lead students with previous professional education in forestry to prepare for research and/or teaching, or to provide greater depth in a specialized area.

The MS is a research-based degree. The student is expected to work closely with a faculty advisor on original research, with the approval of a graduate committee. Advanced coursework is expected to complement and enhance the research project. Students generally complete a thesis and are expected to publish their research results in peer-reviewed scientific journals. A non-thesis option also is available that requires original research normally culminating in authorship of a substantial research paper.

## Students without a Forestry Undergraduate Degree

Those without a baccalaureate degree in forestry may wish to further their education in forest science or to attain professional competence by completing course work in forestry. Work required of students without a forestry degree who want a professional forestry education includes courses in dendrology, utilization of forest resources, resource measurements, forest inventory, forest fire control and use, forest ecology, silviculture, forest information systems, watershed management, forest management, forest economics, and public resource policy. Some of these courses do not carry graduate credit.

### Admission Criteria

Fall deadline: May 15  
 Spring deadline: October 15  
 Summer deadline: March 15

- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	
On or After August 1, 2011	300	

\* 50th percentile or higher preferred in each category.

Particular attention is given to the record of the last 2 years of undergraduate study, and/or the type and quality of professional experience since completion of the undergraduate degree. Doctoral candidates must demonstrate a higher level of achievement in each of these criteria.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents
- 3 letters of recommendation from individuals qualified to evaluate scholarly capacity and professional qualities
- Letter of intent

To the Program:

- Departmental application (use form)
- GRE scores

## MS in Forestry Plan of Study

To attain the master's degree, 30 hours of course work must be completed; 15 hours or more must be 8000+ level. Research, problems, special investigations and special readings courses must not exceed 12 of the 30 hours. The GPA of all course work submitted for the degree must be 3.0 or better.

## Thesis & Exams

A master's thesis, or a minimum of 5 semester hours of non-thesis research acceptable to the student's committee, shall be completed before the final examination. Research toward a thesis normally shall not

exceed 8 hours. Thesis requirements and defense are as defined by the MU Graduate School. A final oral examination is given to all candidates before completion of the degree.

## MS in Natural Resources with emphasis in Human Dimensions of Natural Resources

### Application and Admission Information

Dr. Charles Nilon  
 302 Anheuser-Busch Natural Resources Building; Columbia, MO 65211  
 nilonc@missouri.edu; 573-882-3738

### Emphasis Area Focus

The Human Dimensions of Natural Resources Emphasis Area (HDNR) addresses research and management questions including peoples' attitudes, knowledge, values, perceptions, and behaviors associated with natural resources. As an interdisciplinary emphasis area, HDNR considers applicants with backgrounds in social sciences, environmental education, natural resources management and conservation, or related disciplines.

The MS is a research-based degree. The student is expected to work closely with a faculty advisor to develop a research topic and a program of study. Students who complete a thesis are expected to publish their findings in peer-reviewed journals. A non-thesis option is also available that requires additional coursework and a research project.

### Admission Criteria

- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- GRE Required

### Required Application Materials

To the Graduate School:

- All application materials must be submitted to the Apply Yourself online application system
- Statement of interest
- Résumé or CV
- GRE scores
- TOEFL scores (if applicable)
- A minimum of three letters of recommendation and the accompanying evaluation sheets from people who can attest to the candidate's scholastic ability and experience relevant to graduate study
- Publications (optional)

### Coursework Requirements

All students in the HDNR Emphasis Area will be required to take at least one course from each of three categories:

1. Social science research methods
2. Quantitative and/or qualitative data analysis
3. Social science theory

Each student's coursework requirements, including the selection of specific courses in the above categories, will be listed in the student's plan of study and approved by their graduate committee.

## Thesis Option

Students in the thesis option will complete 30 credit hours of coursework with no more than 12 credits for thesis research. Students choosing the thesis option will prepare a written research proposal and make an oral defense of that proposal within 12 months of their initial enrollment in the program. Students in the thesis option will write a thesis based on their research and participate in a public oral defense of their thesis announced at least two weeks prior to the defense date.

## Non-Thesis Option

Students in the non-thesis option will complete 36 credit hours of coursework with no more than 12 credits for project research. Students choosing the non-thesis option will be required to write a project plan and to make an oral defense of that plan within the first year following their initial enrollment in the program. Students choosing the non-thesis option will write a technical report based on their project and participate in a public oral defense of their report to be announced at least two weeks prior to the defense.

# MS in Natural Resources with emphasis in Parks, Recreation and Tourism

## Admission Contact Information

Dr. Sonja A. Wilhelm Stanis  
 Department of Parks, Recreation and Tourism (<http://snr.missouri.edu/prt>)  
 105 Anheuser-Busch Natural Resources Building; Columbia, MO 65211  
[sonjaws@missouri.edu](mailto:sonjaws@missouri.edu); 573-882-9524

## Emphasis Area Focus

Since virtually everyone participates in some form of leisure, the primary benefit of Parks, Recreation and Tourism (PRT) is to address quality of life issues. The unique interaction of people, places, and activities establish our profession as one of the world's largest industries. Students learn how to manage leisure service delivery systems by combining theory with practice. This degree is designed to prepare students for advanced positions in the parks, recreation, tourism and sport profession or admission into doctoral programs.

The M.S. is a research-based degree. The student is expected to work closely with a faculty advisor to develop a research study and corresponding coursework, with the approval of a graduate committee. Students who complete a thesis are encouraged to publish their findings in peer-reviewed journals. A non-thesis option is also available that requires additional coursework and a research project.

## Application and Admission Information

Submit all required documents in electronic format in the Graduate School's Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) online application system. Contact the emphasis coordinator or School of Natural Resources Director of Graduate Programs if your experience any difficulties.

## Admission Criteria

Fall deadline: Rolling

- GRE required
- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- To be accepted as a candidate for the degree, an applicant must possess an undergraduate degree and academic performance that displays a breadth and depth of university education in social, behavioral, mathematical and natural sciences and major-specific coursework.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- Statement of purpose
- Résumé or CV
- Official college transcripts
- GRE scores
- TOEFL scores (for international applicants)
- Three letters of recommendation (use provided form and submit letters online)
- Department application for assistantship (optional)

## Plan of Study

The Master's degree is usually completed in four semesters of study. Students work closely with their advisor to select appropriate coursework that culminates in research or creative scholarly activity.

## Thesis Option

The thesis option requires a minimum of 30 credit hours, including at least 15 hours at the 8000 level (of which, 12 hours must be theory-based courses within the major) and no more than 12 credits for thesis research, problems, and special readings courses. A proposal and oral defense of the thesis are required.

## Non-Thesis

This option requires a minimum of 39 hours, including at least 15 hours at the 8000 level (of which, 12 hours must be theory-based courses in the major) and no more than 12 credits for project research, problems, and special readings courses. Students must give an oral presentation of their project report before graduation.

## Financial Aid from the Program

Funding is available, but assistantships are highly competitive. Prospective students must complete all the necessary application requirements to be considered for departmental funding. Contact the graduate program emphasis coordinator for more details. Applicants should also contact the faculty they want to work with to determine the availability of possible graduate assistantship positions.

# MS in Natural Resources with emphasis in Soil, Environmental and Atmospheric Sciences

## Admission Contact Information

Dr. Peter Motavalli, emphasis area coordinator  
 (mailto:motavallip@missouri.edu)  
 Department of Soil, Environmental and Atmospheric Sciences  
 University of Missouri  
 302 Anheuser-Busch Natural Resources Building  
 Columbia, MO 65211 USA  
 573-884-3212

The M.S. degree in Natural Resources with emphasis in Soil, Environmental and Atmospheric Sciences (SEAS) is divided into three focus areas: soil science, environmental science or atmospheric science. Graduate candidates in the SEAS emphasis area must select one focus area of study and meet the admission criteria and degree requirements for the selected area.

## Recommended Preparation

Appropriate undergraduate majors in preparation for graduate studies in the soil, environmental and atmospheric emphasis area include: agronomy, atmospheric science, biochemistry, biology, biogeochemistry, botany, chemistry, earth science, civil and environmental engineering, environmental science, forestry, geosciences, hydrology, mathematics, microbiology, physics, soil science, and watershed management. Check with the Emphasis Area Coordinator for specific recommendations for preparation for each graduate focus area.

## Admission Criteria

Deadline: two months prior to the start of the academic semester for which the applicant is applying

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
71	530

Minimum Academic IELTS overall score:

Item	Score
IELTS	5.5

Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	3.5
On or After August 1, 2011	300	3.5

## Completion of a BS Degree

Undergraduate GPA of 3.0 for the last 60 hours of coursework

- Atmospheric science focus area applicants:** undergraduate program should include integral calculus and one year of college physics.

- Environmental science focus area applicants:** undergraduate program should include general and organic chemistry, introductory biology, calculus, geology, physics, and ecology.
- Soil science focus area applicants:** completed courses in general and organic chemistry, calculus, geology and physics. Inadequacies in courses must be remedied through additional course work immediately after admission.

All applications and supporting application materials for graduate admission into the M.S. program with emphasis in SEAS must be submitted to the Graduate School using the Apply Yourself online application system. The focus area of interest should be indicated in the application.

## Required Application Materials:

- Letter of self-evaluation
- GRE score report
- Three letters of recommendation
- Official transcripts
- Official scores from TOEFL or another approved test of English proficiency is required from international applicants.

Submit all required documents in electronic format in the Graduate School's Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) online application system.

## MS Degree Requirements

The degree program with emphasis in SEAS must include 30 hours of graduate credit, with at least 15 hours comprised of 8000- or 9000-level courses. Not more than 12 hours of the minimum 30 hours are permitted for research, problems, special investigations and special readings. A minimum of one credit hour of graduate seminar must be included in each student's graduate program.

All students enrolled in graduate programs are required to participate in a supervised teaching activity.

All students are required to attend a workshop on ethics and professionalism.

Students must maintain a GPA of 3.0 (A=4.0) in all course work presented for the degree.

**For an atmospheric science focus area**, appropriate atmospheric science courses must be selected and approved in consultation with the student's advisor and graduate thesis committee.

**For a soil science focus area**, at least 12 credit hours of soil science courses at the 7000, 8000, and 9000 levels, exclusive of problems and thesis research, must be included in the student's graduate program.

**For an environmental science focus area**, at least six credit hours of environmental science courses at the 7000, 8000, and 9000 levels, exclusive of problems and thesis research, must be included in the student's graduate program. To meet the six credit hour requirement, courses must be selected from the following list of approved environmental science courses:

ATM_SC 7520	Environmental Biophysics	3
ENV_SC 7305	Environmental Soil Physics	3
ENV_SC 7306	Environmental Soil Physics Laboratory	2
ENV_SC 7312	Environmental Soil Microbiology	3
ENV_SC 7318	Environmental Soil Chemistry	3

ENV_SC 7320	Hydrologic and Water Quality Modeling	3
ENV_SC 8400	Solute Transport in the Vadose Zone	3
ENV_SC 8500	Chemistry of the Vadose Zone	3
FOREST 7390	Watershed Management and Water Quality	3
FOREST 8390	Physical Hydrology	3
SOIL 7308	Soil Conservation	3
SOIL 7313	Soil Fertility and Plant Nutrition	3
SOIL 7314	Soil Fertility and Plant Nutrition Laboratory	2
SOIL 7320	Genesis of Soil Landscape	4
SOIL 9414	Advanced Soil Fertility	3
SOIL 9422	Pedology	3
Total Credits		47

To complete the environmental science focus area, an additional six credit hours must be selected from courses listed above or from the following departments: biochemistry, biological engineering, biological sciences, chemical engineering, chemistry, civil and environmental engineering, fisheries and wildlife sciences, forestry, geography, geological sciences, and natural resources. Selection of these courses will be determined in consultation with faculty members serving on a student's thesis committee.

## Thesis

A thesis, which is a research report of original research on a specialized soil, environmental or atmospheric science problem conducted by the student, must be presented to the student's graduate committee and successfully defended.

## Non-Thesis Option

Under special circumstances, a non-thesis program in the soil science, environmental science or atmospheric science focus area may be approved by the student's advisory committee, the SEAS Emphasis Area Coordinator and the Director of Graduate Studies. Not more than 6 hours of the minimum 30 hours are permitted for non-thesis research, problems, special investigations and special readings. At least 15 hours of the minimum 30 hours must be 8000- or 9000-level courses. A minimum of one credit hour of graduate seminar must be included in each student's graduate program. The student is required to participate in a supervised teaching activity and attend a workshop on ethics and professionalism. A student in the non-thesis option must form a graduate advisory committee and have that committee approve of the student taking the non-thesis option, the proposed course plan, and a project for the student to complete to meet the requirements of the non-thesis option. The student will complete a written report for the project which must be approved by the student's advisory committee.

## Financial Aid from the Program

Check the program website (<http://www.snr.missouri.edu/seas/academics/graduate-program.php>) or contact the program for details on scholarships or graduate assistantships that may be available.

## Integrated B.S./M.S. Program

Undergraduate students enrolled in the Department of Soil, Environmental and Atmospheric Sciences (SEAS) are eligible to apply for the integrated degree program in soil, environmental and atmospheric sciences that will enable outstanding undergraduates to obtain a B.S. and a M.S. (thesis required) after the successful completion of both

degree requirements in five years. The program provides a challenging curriculum that will include opportunities and training in undergraduate and graduate-level research and prepare the student for a successful professional career. Increasingly, employers in competitive technical fields are looking for highly-motivated students with graduate training to meet the demands for their work force and this program will provide talented students with a unique and expedited pathway to develop their educational background and professional skills.

## Overview

Undergraduate students in SEAS interested in the integrated B.S./M.S. program will be encouraged to participate in an undergraduate research experience during the summer of their sophomore year. They will apply and then be selected to enter the integrated B.S./M.S. program during the second semester of their junior year. Selected students will need to meet admission requirements for the Graduate School. Once selected the students will initiate work on their research during the summer of their junior year. During their senior year they will complete their undergraduate credits and can take up to 12 graduate-level credits (courses with numbering 7000 or higher) under MU's dual enrollment program. After completing the B.S. degree, students will continue their research and take the remaining coursework on their M.S. plan of study necessary to meet the 30 credit hour minimum required by the Graduate School for the M.S. degree. Several scholarships are currently available at the University of Missouri to assist outstanding students for the costs of their undergraduate and graduate education and for conducting undergraduate research, including the Honors College Discovery Fellowships Program and CAFNR and Life Sciences Undergraduate Research Fellowships.

## Admission Procedures

Students seeking admission into the program should submit an application to the SEAS Emphasis Area Coordinator at the beginning (i.e., January 30th) of the Spring semester of their junior year. A faculty committee will consider several criteria for admission into the Integrated B.S./M.S. Program including:

1. the student's undergraduate GPA (60 or more credits; minimum GPA of 3.5 at the time of enrollment)
2. a formal statement of interest indicating the intended emphasis area (i.e., soil science, environmental science or atmospheric science)
3. three letters of recommendation with one letter being a formal nomination letter from a SEAS Department faculty member

A student who meets the eligibility requirements will be extended an offer of admission by the middle of the Spring semester. All students must select a faculty mentor/advisor after admission to the program. A faculty advisory committee will be selected for each student and they will meet during the semester to approve a course of study and assist the student in designing and conducting their research program. Students will prepare a research proposal to be reviewed and accepted by their advisory committee. After approval of the research proposal, students will initiate their research during the summer of their junior year. Formal application of the student into the Graduate School will take place during the final semester of the student's senior year and is contingent on the student's successful completion of B.S. degree requirements and meeting eligibility requirements for the graduate program. Students will be required to maintain a cumulative 3.0 GPA during the program, write an M.S. thesis and meet other M.S. degree requirements.

For more information about the program, contact either of the following people:

Dr. Neil Fox, Undergraduate Advisor Chair  
Department of Soil, Environmental and Atmospheric Sciences  
University of Missouri  
302 ABNR Bldg  
Columbia, MO 65211 USA  
Tel. No. (573) 882-2144  
Fax No. (573) 884-5070  
Email: foxn@missouri.edu

or

Dr. Peter Motavalli, Emphasis Area Coordinator  
Department of Soil, Environmental and Atmospheric Sciences  
University of Missouri  
302 ABNR Bldg  
Columbia, MO 65211 USA  
Tel. No. (573) 884-3212  
Fax No. (573) 884-5070  
Email: motavallip@missouri.edu

## MS in Natural Resources with emphasis in Water Resources

School of Natural Resources  
Water Resources Emphasis Area  
203-Q Anheuser-Busch Natural Resources Building  
573-884-7732

**Emphasis Area Coordinator:** Jason A. Hubbart

### Application and Admission Information

#### Admission Contact Information

Dr. Jason A. Hubbart  
203-Q ABNR Bldg.  
HubbartJ@Missouri.edu

The Water Resources emphasis area is an interdisciplinary graduate degree program encompassing all fields of natural sciences and, through collaboration, involves expertise from throughout the University of Missouri (MU). The geographic location of MU in the prairie-forest ecotone allows directed research to better understand water movement, biogeochemical cycling, biological and ecohydrological processes of flowing and impounded waters in forested- agricultural and urban landscapes of the midcontinent.

### Water Resources Program Description

The Water Resources graduate emphasis area offers an M.S. degree program specializing in (but not limited to) the occurrence, circulation, distribution, chemical and physical properties, and environmental interaction of surface and subsurface waters, including groundwater. Specific areas of investigation could include lakes and reservoirs, floods and droughts, groundwater aquifers, water use, water quality, water contamination, plant water use, measurement methods, hydrologic modeling and International water resources.

Participating faculty in the Water Resources emphasis area are engaged in both scientific understanding of water resources (biological, chemical and physical) and its management, and the decision-making processes used to address competing societal values (social, economic and legal). The program has no geographic boundaries but benefits from a

distinct midcontinent climate, and physiography. Multi-use watersheds (e.g. forest, agriculture, urban), streams, lakes, rivers, wetlands and subsurface waters are ideal areas for basic and applied research that is easily transferable to other regions. The program provides Global impact by graduating highly qualified water resource professionals.

The Water Resources graduate degree program is integrated by a set of common courses from which students can customize their Course Plans. Students and their Advisors are not restricted to those courses, but are expected to draw from the list first when developing Course Plans.

Water Resources program applicants must meet the general requirements (<http://gradschool.missouri.edu/admissions/eligibility-process/minimum-requirements.php>) set forth by the University of Missouri Graduate School (<http://gradschool.missouri.edu>) for M.S. degrees, and meet any additional application criteria of the Water Resources graduate emphasis area. Students often self-fund, apply for teaching assistantships, or are supported by grant-funded research assistantships. Other opportunities may be available to eligible students.

Upon successful completion of the School of Natural Resources Water Resources graduate program, students will possess strong technical skills in water resources and related sub-disciplines. Graduates will have developed a holistic understanding of the hydrologic cycle related to ecosystem processes as and the interdisciplinary background necessary to understand and address contemporary water resources problems. Graduates will have an appreciation of the complex interactions of biophysical processes and tightly coupled socioeconomic interactions necessary to implement water resource policy.

### Application Process

Interested applicants should forward by email a copy of their transcript, curriculum vitae, recent GRE scores, recent TOEFL scores (if appropriate), cover letter, a letter describing research interests (2 page limit), a letter describing career goals (2 page limit), and the names and contact information of three references. Documents should be forwarded to the Emphasis Area Graduate Student Coordinator and prospective program Advisor. Graduate applications will be distributed through the office of the SNR Director of Graduate Studies (DGS), reviewed by the prospective advisor, emphasis area coordinator, and two emphasis area participating faculty of divergent disciplines within the emphasis area.

### Admissions Course Requirements

Coursework in the following areas are required for (M.S.) admission to the Water Resources graduate degree program. Entry requirements can be waived under extraordinary circumstances. Provisional admission for M.S. students may be granted to those who have completed the majority of this coursework, provided the remaining coursework is completed as deficiency requirements.

- Calculus (3 credits)
- Chemistry (3 credits)
- Physics (3 credits)
- Biology/Ecology (3 credits)

### Admission Criteria

- Fall deadline: May 15
- Spring deadline: October 15
- Summer deadline: March 15
- Minimum GPA: 3.2 in last 60 hours

- Minimum GRE score: 50th percentile or higher preferred in each category or Verbal + Quantitative totaling 1200 (or higher).
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

Particular attention is given to the record of the last 2 years of undergraduate study, and/or the type and quality of professional experience since completion of the undergraduate degree.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents
- 3 letters of recommendation from individuals qualified to evaluate scholarly capacity and professional qualities
- Letter of intent

To the Graduate Emphasis Area Coordinator:

- Please see "Application Process" above.

## Water Resources: Masters of Science Requirements

<http://gradschool.missouri.edu/policies/index.php>

To attain the master's degree, 30 hours of course work must be completed, and 15 hours or more shall be 8000 level. Not more than 40 percent of the 30 hour credit requirement can be satisfied by a combination of special investigations, Research, Readings and/or Problems courses. A maximum of 20 percent of the number of credit hours required for a student's degree may be graduate credits transferred from another university, including another campus of the University of Missouri system upon the recommendation of the advisor, the approval of the academic program director of graduate studies and the Graduate School.

Required coursework and research activities are determined by the student's graduate committee. The graduate committee must consist of at least 3 members with one faculty member outside the Emphasis Area. The GPA of all course work submitted for the degree must be 3.0 or better.

A thesis shall be completed before the final examination. Research credits toward a thesis normally shall not exceed eight hours. Thesis requirements and defense are as defined by the MU Graduate School. A final oral examination is provided by all candidates before completion of the degree.

## Forms and Timelines for Master's students:

<http://gradschool.missouri.edu/forms-downloads/index.php>

### *M1 Plan of study for Master's Degree*

<http://gradschool.missouri.edu/forms-downloads/repository/m1.pdf>

Together with his/her advisor, the student completes this form and provides it to the Director of Graduate Studies in the emphasis area. This form provides the student, the department and the Graduate School with a plan for all course work, transfer credit and research hours that will comprise a student's program of study. This form should be completed by the end of the second semester.

### *M2 Request for Thesis Committee*

<http://gradschool.missouri.edu/forms-downloads/repository/m2.pdf>

This form accompanies the M1, and should be submitted at the same time, by the end of the second semester. It is required of students who will be writing a thesis.

### *M3 Report of Master's Examining Committee*

<http://gradschool.missouri.edu/forms-downloads/repository/m3.pdf>

This form reports the final results of 1) master's thesis defense 2) master's project presentation or 3) master's comprehensive examination. Submit to the Graduate School as soon as possible after the exam, project presentation or thesis defense.

**Thesis defense seminar:** All students must present a defense seminar in advance of his/her final examination. The seminar must be publicized and the Director of Graduate Studies needs to be informed of the date as soon as the student arranges it, at least two weeks before the seminar.

If the seminar is not appropriated announced, it will be considered invalid.

## M.S. Committee Meeting Minimum Requirements

M.S. Students must meet with their committee at least twice during their degree seeking program.

**First meeting:** Present a written research proposal, provide a proposal presentation to the committee and present their M1, and M2 for approval and signing.

**Second meeting:** Often following public thesis defense. Defend thesis, present M3 for approval and signing.

## Water Resources: Master's Graduation Guidelines

Each student (M.S. and Ph.D.) is to complete the application for graduation early in the last semester of enrollment. The student is to inform the Director of Graduate Studies and Emphasis Area Coordinator of his / her intention to graduate. Students are to apply for graduation directly to the Graduate School. NOTE: Deadlines are early in the semester.

<http://gradschool.missouri.edu/academics/graduation-commencement/application-for-graduation.php>

## Thesis Guidelines

Every candidate should review the "Guidelines for Preparing Theses and Dissertations" from the Graduate School and should consult the Emphasis Area Coordinator for academic program style requirements.

<http://gradschool.missouri.edu/academics/thesis-dissertation/diss-thesis-guideline/index.php>

## Graduate Student Publication Requirements

M.S. Students are required to publish at least one article in the primary literature stemming from their master's thesis.

## Graduate Student Conference Requirements

M.S. Students are required to present their research at one or more professional conferences during matriculation.

## PhD Natural Resources

The PhD in Natural Resources has emphasis areas in Fisheries & Wildlife Sciences (p. 88), Forestry (p. 89), Human Dimensions of Natural Resources (p. 89), Soil, Environmental & Atmospheric Sciences (p. 90), and Water Resources (p. 91). Please see the individual emphasis area pages for degree requirements and admissions information.

## PhD in Natural Resources with emphasis in Fisheries and Wildlife Sciences

Admission Contact Information  
 Graduate Secretary  
 302 Anheuser-Busch Natural Resources Building; Columbia, MO 65211  
 Janice Faaborg; faaborgje@missouri.edu; 573-882-9422 or  
 Karen Decker; deckerkf@missouri.edu; 573-882-3436

### Admission Criteria

Fall deadline: Rolling

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	
On or After August 1, 2011	1100 equivalent scores	

- Minimum GPA: 3.2 in last 60 hours of undergraduate coursework.
- Experience in research or management of natural resources. Practical skills are strongly considered. Admission Criteria

### Required Application Materials

To the Graduate School:

- All application materials must be submitted to the Apply Yourself online application system
- All required Graduate School documents
- A minimum of three letters of recommendation and the accompanying evaluation sheets from people who can attest to the candidate's scholastic and conservation field work abilities
- Departmental application
- Written response to 1 of 5 questions listed on the Fisheries and Wildlife Sciences Graduate Program Admissions page
- GRE scores
- TOEFL scores (when applicable)

- Publications (optional)
- Résumé or CV

We require applicants to contact specific faculty to determine the availability of research assistantships prior to applying to the program.

An applicant contemplating graduate work in fisheries, limnology, conservation biology, or wildlife should have a strong background in biological and physical sciences, including biology, botany, zoology, ecology, physiology, and genetics. In addition, such taxonomic courses as plant taxonomy, invertebrate zoology, ichthyology, ornithology, and mammalogy are highly desirable, as is a background in chemistry, mathematics, statistics, and physics.

A background of 25 to 30 hours in biological sciences courses is desirable. Minor deficiencies may be remedied during the graduate program; major deficiencies may require preparatory coursework prior to consideration for admission.

Fisheries and Wildlife Sciences degrees emphasize resource management at organismal, population, or ecosystem scales. An emphasis on resource management helps distinguish our program from basic biology; therefore, course work in fisheries or wildlife management, environmental science, resource policy, or other applied ecology fields is advantageous.

### PhD Degree Completion Requirements

The PhD degree is conferred only upon those students who, after extensive study, have demonstrated a high level of achievement in their particular specialization in fisheries and wildlife and have completed independent research contributing to knowledge in the field.

### Doctoral Committee

A student pursuing a PhD is expected to pass qualifying, comprehensive, and final examinations administered by the student's doctoral committee. The committee shall be composed of a minimum of 4 members of the MU graduate faculty and will include at least 3 members from the student's doctoral degree program and 1 outside member from a different MU program. At least 2 of the committee members must be MU doctoral faculty.

### Qualifying Examination

The qualifying examination includes a general knowledge examination and is designed to evaluate the student's background and determine areas that require further course work.

### Plan of Study

The doctoral plan of study requires a minimum of 72 hours of graduate credit from courses taken at MU, transfer credits, and research hours. This program must include at least 15 hours of 8000- and 9000-level course work exclusive of problems, readings, and research credits. Up to 30 hours from an accredited master's program may be applied to the plan of study, subject to committee approval.

### Residency Requirement

Students enrolled in the PhD program must also satisfy a residency requirement of at least 3 consecutive semesters in which the student is in residence on the MU campus and enrolled for 6 or more credit hours, unless a prior exception is approved by the director of graduate studies.



## PhD in Natural Resources with emphasis in Forestry

### Admission Contact Information

Dr. Stephen G. Pallardy  
203 ABNR Bldg.  
Columbia, MO 65211  
pallardys@missouri.edu

### Doctorate in Forestry

The PhD degree in forestry is designed to prepare students for academic careers in research and teaching or other advanced scientific or professional careers. Students entering the PhD program will often have a master's degree, but this is not an absolute requirement.

PhD candidates conduct original research under the supervision of a faculty advisor or advisors and with the participation of a doctoral committee. Students are expected to engage in coursework to prepare for careers in research, industry or academia. The Department of Forestry expects students to take part in professional and educational activities by giving presentations at conferences and presenting seminars. Ph.D. candidates complete a dissertation and are expected to publish their research results in peer-reviewed scientific journals.

### Admission Criteria

Fall deadline: May 15  
Spring deadline: October 15  
Summer deadline: March 15

- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	
On or After August 1, 2011	300	

\* 50th percentile or higher preferred in each category.

Particular attention is given to the record of the last 2 years of undergraduate study, and/or the type and quality of professional experience since completion of the undergraduate degree. Doctoral candidates must demonstrate a higher level of achievement in each of these criteria.

### Required Application Materials

To the Graduate School:

- All required Graduate School documents
- 3 letters of recommendation from individuals qualified to evaluate scholarly capacity and professional qualities
- Letter of intent

To the Program:

- Departmental application (use form)
- GRE scores

### Doctoral Committee in Forestry

The student pursuing the doctoral program is expected to pass qualifying, comprehensive and final examinations administered by the student's doctoral committee. This committee is structured as defined by the MU Graduate School and must have a minimum of 4 members, at least 3 members must be from the student's doctoral degree program and 1 outside member from a different MU program. The Forestry Department strongly recommends a 5-person committee for Ph.D. students. At least 2 of the committee members must be MU doctoral faculty.

### Doctoral Qualifying Examination

The qualifying examination determines whether the student's background is adequate to enter the PhD program. It also is intended to ascertain if there are areas of weakness in which a candidate will be required to gain background through appropriate course work or areas that prohibit entry into the program.

### Doctoral Comprehensive Examination

The objectives of the comprehensive examination are twofold:

1. to determine if a student has acquired sufficient depth and breadth of knowledge in selected areas of concentration
2. to evaluate the candidate's capacity to apply that knowledge in solving applied or theoretical problems.

### Final Examination

The final examination is directed primarily toward exploration of the dissertation research project.

### Foreign Language Requirements

Requirements for foreign language and a collateral field, if any, are determined by the student's doctoral committee. The doctoral committee is expected to make an assessment of the student's needs as they relate to the student's background and educational objectives.

### Dissertation

An independent scholarly dissertation approved by the student's advisor and doctoral committee must be completed.

### Graduation Requirements

The PhD degree is conferred only upon those students who, after extensive study, have demonstrated a high level of achievement in their particular specialization in forestry and have completed significant independent research in their field.

## PhD in Natural Resources with emphasis in Human Dimensions of Natural Resources

### Application and Admission Information

Dr. Charles Nilon  
302 Anheuser-Busch Natural Resources Building; Columbia, MO 65211  
nilonc@missouri.edu; 573-882-3738

## Emphasis Area Focus

The Human Dimensions of Natural Resources Emphasis Area (HDNR) addresses research and management questions including peoples' attitudes, knowledge, values, perceptions, and behaviors associated with natural resources. As an interdisciplinary emphasis area, HDNR considers applicants with backgrounds in social sciences, environmental education, natural resources management and conservation, or related disciplines.

The Ph.D. degree in HDNR is designed to prepare students for careers in academic research and teaching, or advanced scientific professions. The Ph.D. degree is conferred upon students who have demonstrated a high level of achievement in their particular specialization and have completed independent research contributing to knowledge in their respective field.

## Admission Criteria

- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- GRE Required
- Students are expected to have completed a Master's or equivalent degree at the time they start their doctoral program

## Required Application Materials

To the Graduate School:

- All application materials must be submitted to the Apply Yourself online application system
- Statement of interest
- Résumé or CV
- GRE scores
- TOEFL scores (if applicable)
- A minimum of three letters of recommendation and the accompanying evaluation sheets from people who can attest to the candidate's scholastic ability and experience relevant to graduate study
- Publications (optional)

## Coursework Requirements

All students in the HDNR Emphasis Area will be required to take at least one course from each of three categories:

1. Social science research methods
2. Quantitative and/or qualitative data analysis
3. Social science theory

Each student's coursework requirements, including the selection of specific courses in the above categories, will be listed in the student's plan of study and approved by their graduate committee.

## Doctoral Degree Requirements

The HDNR doctoral program of study requires a minimum of 72 hours of graduate credit from courses taken at MU, transfer credit from a Masters or equivalent degree, and research hours. Doctoral students will be expected to follow a timeline toward completion of their degree:

1. Within one year of initial enrollment in the emphasis area, doctoral students must pass a written qualifying examination and submit a plan of study as defined by the Graduate School.

2. Within three years of initial enrollment in the emphasis area, doctoral students must present a written proposal of their research and an oral defense of that proposal to be reviewed and approved by members of the students' doctoral committee.
3. Within three years of initial enrollment in the emphasis area, doctoral students must pass a written and oral comprehensive examination. The oral portion of the comprehensive examination may be combined with the research proposal oral defense.
4. Doctoral students will submit a written dissertation following the guidelines specified by the Graduate School. All doctoral students must present a public oral defense of their dissertation announced at least two weeks prior to the defense date.

## PhD in Natural Resources with emphasis in Soil, Environmental and Atmospheric Sciences

### Admission Contact Information

Dr. Peter Motavalli, Emphasis Area Coordinator  
 (motavallip@missouri.edu)  
 302 Anheuser-Busch Natural Resources Building  
 Columbia, MO 65211 USA  
 573-884-3212

The Ph.D. degree in Natural Resources with emphasis in Soil, Environmental and Atmospheric Sciences (SEAS) is divided into two focus areas: soil science or atmospheric science. Graduate candidates in the SEAS emphasis area must select one focus area of study and meet the admission criteria and degree requirements for the selected area.

### Admission Criteria

Deadline: two months prior to the start of the academic semester for which the applicant is applying

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
71	530

- Minimum Academic IELTS overall score:

Item	Score
IELTS	5.5

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	3.5
On or After August 1, 2011	300	3.5

- Completion of an MS degree or equivalent. A waiver of the MS degree requirement may be made by the candidate's doctoral program committee.

**Note:** All applications and supporting application materials for graduate admission into the SEAS emphasis area must be submitted to the Graduate School using the Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) online application system. The focus area of interest should be indicated in the application.

## Required Application Materials

- Letter of self-evaluation
- GRE score report
- Three letters of recommendation
- Official transcripts
- Official scores from TOEFL or another approved test of English proficiency is required from international applicants.

Submit all required documents in electronic format to the Graduate School's Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) online system. The focus area of interest should be indicated in the application.

## PhD Degree Requirements

The curriculum is developed by a doctoral program committee and requires a minimum of 72 semester hours beyond the baccalaureate degree. At least 15 hours of course work in the degree program must be at the 8000 and 9000 levels, exclusive of research, problems and independent study experiences. A minimum of two credit hours of graduate seminar must be included in each student's graduate program.

At least 12 credit hours of soil science courses at the 7000, 8000, and 9000 levels, exclusive of problems and thesis research, must be included in the student's graduate program in the soil science focus area.

All students are required to attend a workshop on ethics and professionalism.

## Qualifying Exam

The student should take the qualifying examination soon after admission into the PhD program and submit an approved plan of study to the Graduate School. It is departmental policy that a student is only allowed one opportunity to pass the qualifying exam.

## Teaching

All students enrolled in graduate programs are required to participate in a supervised teaching activity.

## Comprehensive Exam

After successfully completing the required course work with a GPA of 3.0 (A=4.0) or better, students must pass a written and oral comprehensive examination administered by their doctoral program committee.

## Dissertation

A dissertation, which is a comprehensive report of original research on a specialized soil or atmospheric science problem conducted by the student, must be presented to the student's graduate committee and successfully defended.

## Financial Aid from the Program

Check the program website (<http://www.snr.missouri.edu/seas/academics/graduate-program.php>) or contact the the program for details on scholarships or graduate assistantships that may be available.

## PhD in Natural Resources with emphasis in Water Resources

### School of Natural Resources

Water Resources Emphasis Area  
203-Q Anheuser-Busch Natural Resources Building  
573-884-7732

**Emphasis Area Coordinator:** Jason A. Hubbart

The Water Resources emphasis area is an interdisciplinary graduate degree program encompassing all fields of natural sciences and, through collaboration, involves expertise from throughout the University of Missouri (MU). The geographic location of MU in the prairie-forest ecotone allows directed research to better understand water movement, biogeochemical cycling, biological and ecohydrological processes of flowing and impounded waters in forested- agricultural and urban landscapes of the midcontinent.

### Water Resources Program Description

The Water Resources graduate emphasis area offers a Ph.D. degree program specializing in (but not limited to) the occurrence, circulation, distribution, chemical and physical properties, and environmental interaction of surface and subsurface waters, including groundwater. Specific areas of investigation could include lakes and reservoirs, floods and droughts, groundwater aquifers, water use, water quality, water contamination, plant water use, measurement methods, hydrologic modeling and International water resources.

Participating faculty in the Water Resources emphasis area are engaged in both scientific understanding of water resources (biological, chemical and physical) and its management, and the decision-making processes used to address competing societal values (social, economic and legal). The program has no geographic boundaries but benefits from a distinct midcontinent climate, and physiography. Multi-use watersheds (e.g. forest, agriculture, urban), streams, lakes, rivers, wetlands and subsurface waters are ideal areas for basic and applied research that is easily transferable to other regions. The program provides Global impact by graduating highly qualified water resource professionals.

The Water Resources graduate degree program is integrated by a set of common courses from which students can customize their Course Plans. Students and their Advisors are not restricted to those courses, but are expected to draw from the list first when developing Course Plans.

Water Resources program applicants must meet the general requirements set forth by the University of Missouri Graduate School for Ph.D. degrees, and meet any additional application criteria of the Water Resources graduate emphasis area. Students often self-fund, apply for teaching assistantships, or are supported by grant-funded research assistantships. Other opportunities may be available to eligible students.

Upon successful completion of the School of Natural Resources Water Resources graduate program, students will possess strong technical skills in water resources and related sub-disciplines. Graduates will have developed a holistic understanding of the hydrologic cycle related to ecosystem processes as and the interdisciplinary background necessary to understand and address contemporary water resources problems. Graduates will have an appreciation of the complex interactions of biophysical processes and tightly coupled socioeconomic interactions necessary to implement water resource policy.

## Application and Admission Information

### Admission Contact Information

Dr. Jason A. Hubbart  
203-Q ABNR Building  
HubbartJ@missouri.edu

## Application Process

Interested applicants should forward by email a copy of their transcript, curriculum vitae, recent GRE scores, recent TOEFL scores (if appropriate), cover letter, a letter describing research interests (2 page limit), a letter describing career goals (2 page limit), and the names and contact information of three references. Documents should be forwarded to the Emphasis Area Graduate Student Coordinator and prospective program Advisor. Graduate applications will be distributed through the office of the SNR Director of Graduate Studies (DGS), reviewed by the prospective advisor, emphasis area coordinator, and two emphasis area participating faculty of divergent disciplines within the emphasis area.

## Admissions Course Requirements

Coursework in the following areas are required for (Ph.D.) admission to the Water Resources graduate degree program. Entry requirements can be waived under extraordinary circumstances. Provisional admission for Ph.D. students may be granted to those who have completed the majority of this coursework, provided the remaining coursework is completed as deficiency requirements.

- Calculus (3 credits)
- Chemistry (3 credits)
- Physics (3 credits)
- Biology/Ecology (3 credits)

## Admission Criteria

- Fall Deadline: May 15
- Spring Deadline: October 15
- Summer Deadline: March 15
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE Score: 50<sup>th</sup> percentile or higher preferred in each category or Verbal + Quantitative totaling 1200 (or higher).
- Particular attention is given to the record of the last 2 years of undergraduate study, and/or the type and quality of professional experience since completion of the undergraduate degree.

## Required Application Materials

### To the Graduate School:

- All required Graduate School documents
- 3 letters of recommendation from individuals qualified to evaluate scholarly capacity and professional qualities
- Letter of Intent

### To the Graduate Emphasis Area Coordinator:

- See "Application Process" above.

## Water Resources: PhD Students Requirements

Students in the proposed degree Program must at least meet the general requirements (<https://gradschool.missouri.edu/policies>) set forth by the University of Missouri Graduate School for the Ph.D. degree.

The Water Resources Emphasis Area Faculty and the School of Natural Resources of the University of Missouri award the Ph.D. degree only to those students who have completed necessary coursework and accomplished an independent research project resulting in a dissertation.

The Ph.D. degree in the emphasis area is designed to prepare students for academic careers in research and teaching or other advanced scientific or professional careers. The student pursuing the doctoral degree is expected to pass a qualifying, comprehensive and final examination administered by the student's doctoral committee. This committee is structured at a minimum as defined by the MU Graduate School and must have at least one representatives from a discipline outside the emphasis area and must consist of at least 4 members. An independent scholarly dissertation approved by the student's advisor and program committee must be completed in a form acceptable to the doctoral committee, and MU Graduate School.

The Ph.D. degree is conferred only upon those students who, after extensive study, have demonstrated a high level of achievement in their particular specialization in water resources and have completed independent research contributing to knowledge in the field.

## Credit requirement:

1. MU requires a minimum of 72 hrs beyond the Baccalaureate degree for the Ph.D.
2. The committee may recommend that a certain number of credits be transferred from the Master's degree toward the Ph.D.
3. A maximum of 30 hours of post#baccalaureate graduate credit from an accredited university can be transferred toward the PhD degree program.
4. The program must include a minimum of 15 hours of 8000 level course work, exclusive of problems, readings and research.

## Qualifying Examination:

The qualifying examination determines whether the student's background is adequate to enter the Ph.D. program, as a candidate. It also is intended to ascertain if there are areas of weakness in which a candidate will be required to gain background through appropriate course work. Therefore, it is advisable that the student, in conjunction with advisor, selects a committee and completes the qualifying exam within the first 3 semesters.

## Comprehensive Examination:

The comprehensive examination is taken following the completion of most if not all, the course work requirements established by the graduate committee.

The objectives of the comprehensive examination are twofold:

1. to determine if a student has acquired sufficient depth and breadth of knowledge in selected areas of concentration; and
2. to evaluate the candidate's capacity to apply that knowledge in solving applied or theoretical problems.

## Final Exam (Dissertation Defense Exam):

The final examination is directed toward, but not limited to, exploration of the dissertation research project.

## Dissertation Defense Seminar:

The DGS must be informed of the dissertation defense seminar at least two weeks in advance of the seminar. It must be well advertised and open to the public.

## Water Resources: Doctoral Graduation Guidelines

Each student (Ph.D.) is to complete the application for graduation (<http://gradschool.missouri.edu/academics/graduation-commencement/timeline-deadlines/doctoral-timeline.php>) early in the last semester of enrollment. The student is to inform the Departmental Director of Graduate Studies of his/her intention to graduate. And students are to apply for graduation directly to the Graduate School. Deadlines are early in the semester.

## Dissertation Guidelines

Every candidate should review the Dissertation & Thesis Guidelines (<http://gradschool.missouri.edu/academics/thesis-dissertation/diss-thesis-guideline>) from the Graduate School and should consult the Director of Graduate Studies for academic program style requirements.

## Ph.D. Committee Meeting Minimum Requirements

Ph.D. Students must meet with their committee at least three times during their degree seeking program.

- First Meeting: Present a written research proposal, provide a proposal presentation to the committee and present the D1 and D2 for approval and signing.
- Second Meeting: Comprehensive exam committee meeting.
- Third Meeting: Often following public dissertation defense. Defend dissertation, present D3 and D4 for approval and signing.

## Graduate Student Publication Requirements

Ph.D students are required to publish at least three articles in the primary literature stemming from their dissertation; at least one prior to graduation (may vary by advisor).

## Graduate Student Conference Requirements

Ph.D. students are required to present their research at two or more professional conferences during matriculation.

## Doctoral Forms

Doctoral Timeline for Graduation & Commencement (<http://gradschool.missouri.edu/academics/graduation-commencement/timeline-deadlines/doctoral-timeline.php>)

D-1 Qualifying Examination Results and Doctoral Committee Approval Form (<http://gradschool.missouri.edu/forms-downloads/repository/d1.pdf>)

Submission of this form follows a meeting of the student's graduate committee and approval by the committee, of the student's proposal and plan of research and coursework. This form is to be submitted to the Graduate School no later than the end of the student's second semester of enrollment.

D-2 Plan of Study for the Doctoral Degree Form (<http://gradschool.missouri.edu/forms-downloads/repository/d2.pdf>)

This form accompanies the D#1, and is also to be submitted to the Graduate School no later than the end of the student's second semester of study. Doctoral students must take a minimum of 15 hours of regular 8000/9000 level coursework. This regular coursework cannot include Problems, Independent Readings, Research or other independent study courses.

D-3 Doctoral Comprehensive Examination Results Form (<http://gradschool.missouri.edu/forms-downloads/repository/d3.pdf>)

These forms should be completed and filed with the Graduate School within one month of exam completion.

D-4 Report of the Dissertation Defense Form (<http://gradschool.missouri.edu/forms-downloads/repository/d4.pdf>)

This form should be completed and filed with the Graduate School as soon as possible after the defense. Prior to degree complete, PhD student are required to complete additional forms. See the Graduate school webpage.

## Parks, Recreation and Tourism

D. R. Vaught, Chair  
 School of Natural Resources  
 105 Anheuser-Busch Natural Resources Building  
 Phone: (573) 882-7086  
 Fax: (573) 882-9526  
 vaughtdr@missouri.edu  
<http://snr.missouri.edu/prt/academics/parks-rec-tour.php>

The Department of Parks, Recreation and Tourism is among the oldest nationally accredited programs in the United States. Emphasis areas include: leisure service management, natural resource recreation management, sport management and tourism development. The department integrates classroom learning with applied research and internship experiences and is a leader in technology infusion.

All students are required to complete an internship placement, normally taken during the last year of study and after completing all core courses. The semester-long internship is with an on or off-campus agency or organization chosen by the student and faculty. Regional, national and international internship placements are possible. Students may receive direct financial assistance from the agency or organization during the internship.

The department offers BS and MS degrees with majors in Parks, Recreation and Tourism.

### Admission

It is possible for students who have a broad, liberal education to transfer into the department without a significant time penalty toward graduation. CLEP credits are accepted and evaluated on an individual basis. Minimum GPA of 2.00 required.

### Faculty

**Associate Professor** G. L. Hitzhusen\*, J. M. Morgan\*  
**Assistant Professor** T. D. Hack\*, J. R. Upah\*, D. R. Vaught\*, N. M. Watanabe\*, S. A. Wilhelm-Stanis\*\*  
**Adjunct Professor** D. Eiken\*  
**Instructor** T. Balthazor  
**Director of Internships** J. R. Upah\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 94)
- BS in Parks, Recreation and Tourism (p. 94)
  - with emphasis in Leisure Service Management (p. 96)
  - with emphasis in Natural Resource Recreation Management (p. 96)
  - with emphasis in Sport Management (p. 97)
  - with emphasis in Tourism Development (p. 97)

### Graduate

School of Natural Resources  
 105 Anheuser-Busch Natural Resources Building  
 573-882-7086  
<http://www.snr.missouri.edu/prt/>

**Director of Graduate Studies:** David Vaught

### About Parks, Recreation & Tourism

Since virtually everyone participates in some form of leisure, the primary benefit of Parks, Recreation and Tourism (PRT) is to address quality of life issues. The unique interaction of people, places, and activities establish our profession as one of the world's largest industries. Students learn how to manage service delivery systems by combining theory with practice.

### Career Preparation

The purpose of graduate study is to promote research and scholarship as the foundation of professional excellence, thus preparing candidates for management-level positions or admission to doctoral programs.

### Undergraduate

## Department Level Requirements - Parks, Recreation and Tourism

There are no requirements at the Department Level for this degree. Please see the BS in Parks, Recreation and Tourism (p. 94) page for the major program requirements.

### Honors

Students who graduate with the following cumulative GPA values are awarded the baccalaureate degree accordingly:

3.50-3.69	cum laude
3.70-3.89	magna cum laude
3.90 +	summa cum laude

## BS in Parks, Recreation and Tourism

### Major Program Requirements

Satisfactory completion of 120 credits is required: a minimum of 108 credits in course work and a 12-credit internship with a cumulative GPA of 2.0. Professional preparation includes course work in a professional core, professional option requirements and electives, and an internship. Students must also complete all degree, department, college and university graduation requirements, including university general education (p. 18).

#### Major core requirements (minimum grade of C- in core)

<b>Communications</b>	<b>9</b>
ENGLSH 1000 Exposition and Argumentation	3
COMMUN 1200 Public Speaking	3

or AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources		P_R_TR 1081	Sport Facility Design	3
Communication Elective		3	& P_R_TR 2082	and Domestic and International Sports Environment	
<b>Humanities and Fine Arts</b>		6	& P_R_TR 2083	and Technological Advancement in Sport	
<b>Biological, Physical, and Mathematical Sciences</b>		12	or P_R_TR 2111	Introduction to Planning and Evaluating Leisure Environments	
MATH 1100	College Algebra	3	P_R_TR 2750	Methods in Research and Evaluation	3
STAT 1200	Introductory Statistical Reasoning	3	P_R_TR 3210	Personnel Management and Leadership in Leisure Services	3
or STAT 1300	Elementary Statistics		P_R_TR 3215	Program Development in Leisure Services	3
or STAT 1400	Elementary Statistics for Life Sciences		P_R_TR 3220	Introduction to Recreation for Individuals with Disabilities	2
or STAT 2500	Introduction to Probability and Statistics I		P_R_TR 4208	Administration of Leisure Services	3
or ESC_PS 4170	Introduction to Applied Statistics		<b>Professional emphasis requirements</b>		9-12
Biological, Physical, or Mathematical Science with at least 1 Lab		6	Leisure Service Management emphasis		9
<b>Business Core</b>		9	AG_EC 3224	New Products Marketing	3
ACCTCY 2010	Introduction to Accounting	3	or AG_EC 3285	Problems in Agricultural Economics	
or ACCTCY 2026	Accounting I		or MANGMT 3540	Introduction to Business Law	
or ACCTCY 2036	Accounting I		or P_R_TR 3230	Introduction to Parks and Outdoor Recreation Services	
or ACCTCY 2136H	Honors Accounting I		or P_R_TR 4356	Tourism Management	
ECONOM 1014	Principles of Microeconomics	3	or PUB_AF 4001	Topics in Public Affairs	
or ECONOM 1015	Principles of Macroeconomics		or SOCIOL 2200	Social Inequalities	
or ECONOM 1051	General Economics		or SOCIOL 3255	Youth in Today's World	
or AG_EC 1041	Applied Microeconomics		or SOCIOL 3430	The Sociology of Sport	
or AG_EC 1042	Applied Macroeconomics		P_R_TR 4333	Park Management	3
MRKTNG 3000	Principles of Marketing	3	P_R_TR 4355	Private and Commercial Recreation Principles and Practice	3
or AG_EC 2183	The Agricultural Marketing System		Natural Resources Recreation Management emphasis		9
or AG_EC 3224	New Products Marketing		P_R_TR 3230	Introduction to Parks and Outdoor Recreation Services	3
<b>Social and Behavioral Science</b>		13	P_R_TR 3231	Principles of Interpretive Outdoor Recreation	3
HIST 1100	Survey of American History to 1865	3	P_R_TR 4340	Advanced Recreation Land Management	3
or HIST 1100H	Survey of American History to 1865 - Honors		Tourism Development emphasis		9
or HIST 1200	Survey of American History Since 1865		P_R_TR 4355	Private and Commercial Recreation Principles and Practice	3
or HIST 1200H	Survey of American History Since 1865 - Honors		P_R_TR 4356	Tourism Management	3
or HIST 2210	Twentieth Century America		P_R_TR 4357	Tourism Planning and Development	3
or HIST 2440	History of Missouri		Sport Management emphasis		12
or HIST 4000	Age of Jefferson		P_R_TR 2281	The Business of Sport	3
or HIST 4220	U.S. Society Between the Wars 1918-1945		P_R_TR 3185	Sports Economics and Finance	3
or HIST 4230	Our Times: United States Since 1945		P_R_TR 3282	Governance and Policy in Sport and Leisure	3
or POL_SC 1100	American Government		P_R_TR 4385	Legal Aspects of Sport	3
or POL_SC 1100H	American Government - Honors		<b>Internship</b>		13
or POL_SC 2100	State Government		P_R_TR 3189	Pre-Internship Seminar in Parks, Recreation and Tourism	1
PSYCH 1000	General Psychology	3	P_R_TR 4940	Parks, Recreation and Tourism Internship	12
SOCIOL 1000	Introduction to Sociology	3	<b>Professional option electives</b>		18-21
or RU_SOC 1000	Rural Sociology		Advisor-approved courses specific to the student's selected academic option		
H_D_FS 2400	Principles of Human Development	4			
<b>General Electives</b>		7-10			
<b>Professional core (required for all options)</b>		21			
P_R_TR 1010	Introduction to Leisure Studies	3			
or P_R_TR 1080	Introduction to Sport Management				
P_R_TR 1011	Academic Planning and Career Orientation in Parks, Recreation and Tourism	1			

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000 or MATH 1100	3	MATH 1100 or ENGLISH 1000	3
COMMUN 1200 or AG_ED 2220	3	ECONOM 1014, AG_EC 1041, or AG_EC 1042	3
P_R_TR 1010 or 1080	3	SOCIOL 1000 or RU_SOC 1000	3
P_R_TR 1011	1	Humanities & Fine Arts	3
Humanities & Fine Arts	3	Missouri State Law Requirement	3
Biological, Physical, or Mathematical Science	3		
	<b>16</b>		<b>15</b>
Second Year			
Fall	Credits	Spring	Credits
PSYCH 1000	3	ACCTCY 2010, 2026, 2036, or 2136H	3
STAT 1200, 1300, 1400, 2500, or ESC_PS 4170	3	MRKTNG 3000, AG_EC 2183, or AG_EC 3224	3
P_R_TR 1081 & P_R_TR 2082 & P_R_TR 2083	3	P_R_TR 2750	3
Communication Elective	3	Professional Elective	3
Biological or Physical Science with Lab	3	Emphasis-Area Course	3
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
H_D_FS 2400	4	P_R_TR 3215	3
P_R_TR 3220	2	Emphasis-Area Course	3
Professional Elective	6	Professional Elective	3
Emphasis-Area Course	3	General Elective	7
	<b>15</b>		<b>16</b>
Fourth Year			
Fall	Credits	Spring	Credits
P_R_TR 4208	3	P_R_TR 4940	12
P_R_TR 3210	3		
P_R_TR 3189	1		
Emphasis-Area Course or Professional Elective	3		
Professional Elective	6		
	<b>16</b>		<b>12</b>
Total Credits: 120			

## BS in Parks, Recreation and Tourism with Emphasis in Leisure Service Management

### Major Program Requirements

Students must complete all university, college and degree requirements (p. 94), including university general education (p. 18), in addition to the requirements below:

AG_EC 3224	New Products Marketing	3
or AG_EC 3285	Problems in Agricultural Economics	
or MANGMT 3540	Introduction to Business Law	
or SOCIOL 2200	Social Inequalities	
or SOCIOL 3255	Youth in Today's World	
or SOCIOL 3430	The Sociology of Sport	
or P_R_TR 3230	Introduction to Parks and Outdoor Recreation Services	
or P_R_TR 4356	Tourism Management	
or PUB_AF 4001	Topics in Public Affairs	
P_R_TR 4333	Park Management	3
P_R_TR 4355	Private and Commercial Recreation Principles and Practice	3

Total Credits 9

### Semester Plan

Refer to the Semester Plan for the BS in Parks, Recreation and Tourism (p. 94).

## BS in Parks, Recreation and Tourism with Emphasis in Natural Resource Recreation Management

### Major Program Requirements

Students must complete all university, college, and degree requirements (p. 94), including university general education (p. 18), in addition to the requirements below:

P_R_TR 3230	Introduction to Parks and Outdoor Recreation Services	3
P_R_TR 3231	Principles of Interpretive Outdoor Recreation	3
P_R_TR 4340	Advanced Recreation Land Management	3

Total Credits 9

### Semester Plan

Refer to the Semester Plan for the BS in Parks, Recreation and Tourism (p. 94).



## BS in Parks, Recreation and Tourism with Emphasis in Sport Management

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### Major Program Requirements

Students must complete all university, college and degree requirements (p. 94), including university general education (p. 18), in addition to the requirements below:

P_R_TR 2281	The Business of Sport	3
P_R_TR 3185	Sports Economics and Finance	3
P_R_TR 3282	Governance and Policy in Sport and Leisure	3
P_R_TR 4385	Legal Aspects of Sport	3
Total Credits		12

### Semester Plan

Refer to the Semester Plan for the BS in Parks, Recreation and Tourism (p. 94).

## BS in Parks, Recreation and Tourism with Emphasis in Tourism Development

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### Major Program Requirements

Students must complete all university, college and degree requirements (p. 94), including university general education (p. 18), in addition to the requirements below:

P_R_TR 4355	Private and Commercial Recreation Principles and Practice	3
P_R_TR 4356	Tourism Management	3
P_R_TR 4357	Tourism Planning and Development	3
Total Credits		9

### Semester Plan

Refer to the Semester Plan for the BS in Parks, Recreation and Tourism (p. 94).

## Plant Sciences

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Division of Plant Sciences  
College of Agriculture, Food and Natural Resources  
52 Agriculture Laboratory  
(573) 882-3001  
Fax: (573) 882-2699

**Division Director:** Mike Collins

The Division of Plant Sciences was formed on August 1, 2005, through the consolidation of the former departments of Agronomy, Entomology, Horticulture and Plant Microbiology and Pathology. Programs formerly housed in those departments now reside in the division. The Division of Plant Sciences provides leadership for plant, insect and microbe-based research, education and extension programs in the College.

The division is the sole academic program in the state to address issues related to plant production, plant protection and plant biology from the laboratory to the field. We intend to be at the national and international forefront of disciplinary and interdisciplinary research, extension and education in applied and basic aspects of plant sciences.

Division faculty contribute to advances in conventional, sustainable and alternative production systems, plant biology, genetics and breeding, plant protection and pest management, plant-insect/pathogen interactions, plant-soil relationships and

## Faculty

**Professors** B. A. Barrett\*\*, M. Collins, J. T. English\*\*, R. D. Hall\*, R. L. Kallenbach\*\*, M. J. Linit\*, J. D. Mihail#, T. L. Payne\*, C. Roberts\*\*, C. P. Scharf\*\*, J. E. Schoelz\*\*, R. E. Sharp\*\*, J. C. Shultz\*\*, R. W. Sites#, R. J. Smeda\*\*, M. R. Warmund\*\*, W. J. Wiebold\*\*, J. A. Wrather\*

**Endowed Professors** H. T. Nguyen\*\*, J. G. Shannon#, G. Stacey\*\*

**Associate Professors** W. C. Bailey\*\*, K. W. Bradley#, C. Elsik\*, W. Gassmann\*\*, R. M. Houseman Jr.\*\*, A. L. McKendry\*\*, M. G. Mitchum\*\*, Q. Song#, D. H. Trinklein\*

**Assistant Professors** D. Finke\*, F. B. Fritsch\*\*, D. Mendoza-Cozatl\*\*, G. L. Miller\*\*, D. B. Myers\*, X. Xiong\*\*

**Associate Research Professors** K. A. Nelson\*\*, Z. Zhang\*\*

**Assistant Research Professors** A. Thomas\*

**Extension Professors** W. E. Stevens\*

**Associate Extension Professors** J. A. Lory\*, M. Nathan\*, L. E. Sweets\*

**Assistant Extension Professors** B. Fresenburg\*

**Assistant Teaching Professor** M. A. Gowdy\*, M. Remley\*

**Adjunct Professors** S. H. Anderson\*, P. R. Arelli, C. Fauquet, J. P. Gustafson\*, E. Herman, B. E. Hibbard\*\*, J. C. Hong, L. G. Kovacs\*\*, R. J. Kremer\*, H. B. Krishnan\*, A. H. McIntosh\*, M. D. McMullen\*\*, M. J. Oliver\*\*, W. Qiu\*\*, D. Stanley\*, J. C. Walker\*

**Adjunct Associate Professors** B. Beernsten\*, K. D. Bilyeu\*\*, D. M. Burner\*, E. Cahoon, T. A. Coudron\*\*, J. Gillman\*, C. F. Hwang\*\*, N. R. Kitchen\*\*, P. Motavalli\*, R. L. Myers, D. Schachtman, M. A. Schaeffer, P. Tracy, O. Yu

**Adjunct Assistant Professors** I. Baxter, J. Benne, S. Flint-Garcia\*\*, S. Gu, R. K. Lawrence\*, H. J. Popham\*, K. S. Shelby\*, C. Taylor, P. L. Vincent\*, O. Yu

**Senior Research Scientist** H. M. Appel\*

**Professor Emeritus** S. C. Anand, D. G. Blevins\*\*, A. K. Chatterjee\*\*, G. M. Chippendale, E. H. Coe\*, L. Darrah, J. H. Dunn, A. Keaster, G. Krause, R. Mitchell, G. Neuffer, D. A. Slepser\*, T. D. Wyllie

**Associate Professor Emeritus** R. Munson, B. Puttler  
**Curators' Professor Emeritus** C. J. Nelson\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

Director for Undergraduate Programs

Reid J. Smeda

204 Waters

(573) 882-1329

Fax: (573) 882-1467

smedar@missouri.edu

- Department Level Requirements (p. 99)
- BS in Plant Sciences (p. 99)
  - with emphasis in Crop Management (p. 101)
  - with emphasis in Horticulture Science and Design (p. 101)
  - with emphasis in Breeding, Biology and Biotechnology (p. 101)
  - with emphasis in Turfgrass Science (p. 102)
- Minor in Plant Sciences (p. 102)

The Plant Sciences undergraduate major is a joint contribution of the disciplines of Agronomy, Entomology, Horticulture and Plant Microbiology and Pathology. From the manipulation of genes to increasing crop productivity to improving the quality of life by enhancing the landscape, plant science students are engaged in the science and art of working with plants. Educational opportunities in plant science range from basic (genetics, biotechnology and physiology) to applied (crop production and protection, landscape design and turfgrass).

The division offers the BS degree with a major in Plant Sciences. Students in plant science initially receive a broad education in agriculture, the basic sciences and business. Later, they elect to enroll in a specific emphasis area designed to empower them to be competitive in career opportunities in that area. The emphasis areas are a series of interwoven courses in:

- Crop Management
- Horticultural Science and Design
- Breeding, Biology and Biotechnology
- Turfgrass Science

## Graduate

Division of Plant Sciences

52 Agriculture Laboratory

573-882-3001

573-882-2699

<http://plantsci.missouri.edu/graduate>

**Director of Graduate Studies:** James Schoelz

- MS in Plant, Insect and Microbial Sciences (p. 102)
- PhD in Plant, Insect and Microbial Sciences (p. 104)

The Division of Plant Sciences offers graduate programs leading to master of science and doctor of philosophy degrees in Plant, Insect and Microbial Sciences. A student can select training from a wide range of courses and research programs to prepare for a career in research, teaching, industry and extension work.

The Division of Plant Sciences maintains excellent graduate programs with classroom instruction and research supervision provided by leading scientists in the field. A student can select training in one of several Graduate Program Areas. Students can follow a traditional curriculum or take advantage of the cross-disciplinary expertise that exists within the Division.

## Programmatic Interactions

Students also benefit from interaction with closely allied academic units on and off campus. Students work with scientists in two campus-based USDA research units associated with the division: the Plant Genetics Unit and the Biological Control of Insects Research Laboratory. Additional opportunities exist for interaction with scientists at the Donald Danforth Plant Science Center in St. Louis. Numerous USDA and Danforth Center scientists hold adjunct appointments in the DPS. Students in the DPS are encouraged to interact with interdisciplinary programs on campus such as the Interdisciplinary Plant Group, the Molecular Biology Program, the Genetics Area Program, the Center for Agroforestry and the Missouri Precision Agriculture Center.

## Areas of Study

A student can select training from a wide range of courses and research programs to prepare for a career in research, teaching, industry and extension work. Students may complete their graduate degrees through any of the Graduate Program Areas:

- Crop, Soil and Pest Management
- Entomology
- Horticulture
- Plant Breeding, Genetics and Genomics
- Plant Stress Biology

## Undergraduate

### Department Level Requirements - Plant Sciences

There are no requirements at the department level for this degree. Please see the BS in Plant Sciences (p. 99) page for the major program requirements.

## BS in Plant Sciences

### Major Program Requirements

In addition to CAFNR requirements and the university's general education (p. 18) and graduation requirements, the Division of Plant Sciences requires the following courses. The student must also select one emphasis area. Two writing intensive courses are required under university guidelines.

### Major Core Requirements

#### Communications

ENGLSH 1000	Exposition and Argumentation	3
COMMUN 1200	Public Speaking	3
or AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources	
One of the following courses		3
AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources	
SCI_AG_J 3210	Fundamentals of Communications	
SCI_AG_J 3240	Communicating on the Web	
COMMUN 3441	Nonverbal Communication	
COMMUN 3572	Argument and Advocacy	
COMMUN 3575	Business and Professional Communication	
THEATR 1400	Acting for Non-Majors	
C_S_D 1050	Signed English	
RU_SOC 2225	Science, Technology and Society	
ENGLSH 2030	Professional Writing	
ENGLSH 2010	Intermediate Composition	

#### Math and Science

MATH 1100	College Algebra	3
CHEM 1320	College Chemistry I	4
Any Chemistry or Biochemistry (not CHEM 1100)		5
BIO_SC 1200	General Botany with Laboratory	5
Social and Behavioral Sciences		9
Macro & Micro Economics		4
AG_EC 1041	Applied Microeconomics	3
or ECONOM 1014	Principles of Microeconomics	
AG_EC 1042	Applied Macroeconomics	3
or ECONOM 1015	Principles of Macroeconomics	
State Law Requirement (Select one of the following):		
HIST 1100	Survey of American History to 1865	
HIST 1200	Survey of American History Since 1865	
HIST 1400	American History	
HIST 2210	Twentieth Century America	
HIST 2440	History of Missouri	
HIST 4000	Age of Jefferson	
HIST 4220	U.S. Society Between the Wars 1918-1945	
HIST 4230	Our Times: United States Since 1945	

POL_SC 1100	American Government
POL_SC 2100	State Government

#### Humanistic Studies and/or Fine Arts

Courses may include:		6
AG_EC 3241	Ethical Issues in Agriculture	

SCI_AG_J 3210	Fundamentals of Communications	
AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources	
RU_SOC 1150	The Amish Community	
<b>Major field requirements</b>		61-67
<b>Core Courses:</b>		
Select 20-21 credits from the following:		20-21
PLNT_S 2100	Introduction to Soils	
PLNT_S 2125	Plant Structure and Function	
SOIL 2106	Soil Science Laboratory	
PLNT_S 3130	Undergraduate Seminar in Plant Science	
PLNT_S 3225	Plant Breeding and Genetics	
or PLNT_S 3230	Plant Propagation	
Professional Skills (select one):		
AG_ED 2250	Introduction to Leadership	
AG_ED 2260	Team and Organizational Leadership	
COMMUN 3575	Business and Professional Communication	
ENGLISH 2030	Professional Writing (Or other course approved by Division Advisor)	
Or other course approved by Division Advisor		
<b>Pest Sequence</b>		
Select two of the following:		5-8
PLNT_S 4500	Biology and Pathogenesis of Plant-Associated Microbes	
PLNT_S 3210	Principles of Weed Science	
PLNT_S 3710	Introductory Entomology & PLNT_S and Insect Diversity	
3715		
<b>Emphasis Areas (select 1 from below)</b>		3-12
<b>Capstone Experience</b>		
Within their last 45 hours, students must complete a capstone experience. This requirement may be met by completing any one of the following:		
PLNT_S 4940	Internship in Plant Science	
PLNT_S 4950	Undergraduate Research in Plant Science	
PLNT_S 4975	Advanced Landscape Design	
<b>Business and Economics Courses</b>		
AG_EC 1041	Applied Microeconomics & AG_EC and Applied Macroeconomics	
1042		
Business Electives (6 credits)		
(Choose from Accountancy, Agricultural Economics, Consumer and Family Economics, Finance, Management or Marketing)		
<b>Electives:</b>		
(the hours necessary to total 120 credits)		
<b>Total Credits</b>		140-159

For additional course options see General Education List at <http://generaleducation.missouri.edu/Courses> eligible must include an "HFA" in appropriate column.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
HIST 1100	3	PLNT_S 2100	3		
BIO_SC 1200	5	AG_ED 2220	3		
ENGLISH 1000	3	CHEM 1100	3		
MATH 1100	3	Elective	6		
Humanities Elective	3				
	17		15		
Second Year					
Fall	Credits	Spring	Credits		
CHEM 1320	4	AG_EC 1042	3		
AG_EC 1041	3	PLNT_S 2125	3		
Humanities Elective	6	PLNT_S 3213	3		
AG_S_M 2340	3	Elective	3		
SOIL 2106	2	AG_EC 2183	3		
	18		15		
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
PLNT_S 4500	4	PLNT_S 3130	1	PLNT_S 4940	1-3
PLNT_S 3275	3	Elective	3		
PLNT_S 3710	3	PLNT_S 4313	3		
RU_SOC 1150	3	PLNT_S 4315	3		
THEATR 1400	3	PLNT_S 3225	3		
		AG_EC 2225	3		
	16		16		1-3
Fourth Year					
Fall	Credits	Spring	Credits		
PLNT_S 3210	4	BIOCHM 2112	3		
PLNT_S 3270	3	Electives	12		
Elective	3				
PLNT_S 3175	2				
Elective	3				
	15		15		
Total Credits: 128-130					

## BS in Plant Sciences with Emphasis in Breeding, Biology and Biotechnology

### Major Program Requirements

Manipulation of plants at the cellular and genetic level can lead to improvements in crop performance and resistance to pests, as well as increase plant users. Job opportunities from the laboratory to the field are widespread in seed and chemical industries around the world.

In addition to CAFNR requirements and the university general education (<https://nextcatalog.missouri.edu/academicdegreerequirements/generaleducationrequirements>) and graduation requirements, the Division of Plant Sciences requires the following courses:

Emphasis Area Requirements		18
BIOCHM 3630	General Biochemistry	3
CHEM 2100	Organic Chemistry I	3
PLNT_S 3213	Genetics of Agricultural Plants and Animals	3
PLNT_S 3275	Grain Crops	3
SOIL 4313	Soil Fertility and Plant Nutrition	3
STAT 2530	Statistical Methods in Natural Resources	3
Emphasis Area Requirements fulfilled by core:		
PLNT_S 3225	Plant Breeding and Genetics	3
PLNT_S 4500	Biology and Pathogenesis of Plant-Associated Microbes	4
<b>Select one course from each A, B and C option</b>		10-11
A.		
PLNT_S 4400	Plant Anatomy	4
or BIO_SC 2300	Introduction to Cell Biology	
B.		
PLNT_S 4315	Crop Physiology	3
or PLNT_S 4320	Plant Physiology	
C.		
PLNT_S 4325	Field Crop Breeding	3
or BIO_SC 3210	Plant Systematics	
or BIO_SC 4660	Plant Population Biology	
<b>Total</b>		28-29

### Semester Plan

Refer to the Semester Plan for the BS in Plant Sciences (p. 99).

## BS in Plant Sciences with Emphasis in Crop Management

### Major Program Requirements

The management of food and fiber crops is key to meeting the global demands for food and energy. There are many opportunities to improve plant growth by manipulating production practices and improving control of disease, insect, and weed pests.

In addition to CAFNR requirements and the university general education (p. 18) and graduation requirements, the Division of Plant Sciences requires the following courses:

Emphasis Area Requirements		16-17
BIO_SC 2200	General Genetics	4
or PLNT_S 3213	Genetics of Agricultural Plants and Animals	
PLNT_S 4313	Soil Fertility and Plant Nutrition	3
PLNT_S 4315	Crop Physiology	3
PLNT_S 4500	Biology and Pathogenesis of Plant-Associated Microbes	4
PLNT_S 4730	Insect Pest Management for Plant Protection	3
Emphasis Area Requirements fulfilled by core:		
PLNT_S 3210	Principles of Weed Science	4
PLNT_S 3225	Plant Breeding and Genetics	3
PLNT_S 3710	Introductory Entomology	3
PLNT_S 3715	Insect Diversity	2
<b>System Options (select two)</b>		6-7
PLNT_S 3240	Principles of Viticulture I	4
PLNT_S 3270	Forage Crops	3
PLNT_S 3275	Grain Crops	3
<b>Management Options (select two)</b>		6-7
PLNT_S 4325	Field Crop Breeding	3
PLNT_S 4340	Principles of Viticulture II	4
PLNT_S 4360	Precision Agriculture Science and Technology	3
<b>Total</b>		28-31

### Semester Plan

Refer to the Semester Plan for the BS in Plant Sciences (p. 99).

## BS in Plant Sciences with Emphasis in Horticulture Science and Design

### Major Program Requirements

Trees, flowers and other ornamental plants add beauty to our landscape, preserve green space, and reduce the negative impacts of climate change. Other plants such as vegetables and fruits enhance human health. Career opportunities exist to design landscapes, improve the value and beauty of homes and businesses, as well as commercially grow horticultural crops in greenhouses and other settings.

In addition to CAFNR requirements and the university general education (p. 18) and graduation requirements, the Division of Plant Sciences requires the following courses:

Emphasis Area Requirements		9
PLNT_S 2075	Environmental Horticulture	3
PLNT_S 2210	Ornamental Woody Plants	3
PLNT_S 2215	Ornamental Herbaceous Plants	3
Emphasis Area Requirements fulfilled by core:		
PLNT_S 3230	Plant Propagation	3
PLNT_S 3710	Introductory Entomology	3

PLNT_S 3715	Insect Diversity	2
PLNT_S 4500	Biology and Pathogenesis of Plant-Associated Microbes	4
<b>Select One of the Following Tracks:</b>		
(Note: Tracks do not appear on transcripts or diplomas)		
Landscape Design & Maintenance Track		20
PLNT_S 2002	Topics in Plant Science - Biological/Physical/Mathematics	4
PLNT_S 2254	Landscape Design	3
PLNT_S 3210	Principles of Weed Science	4
PLNT_S 3250	Green Industry Bidding	1
PLNT_S 3355	Introductory Turfgrass Management	3
PLNT_S 3252	Arboriculture and Pruning	1
PLNT_S 4975	Advanced Landscape Design	4
Horticulture Production, Sales & Management Track		21-22
AG_EC 2223	Agricultural Sales	3
PLNT_S 3250	Green Industry Bidding	1
PLNT_S 3260	Greenhouse Management	4
PLNT_S 4365	Greenhouse Crops Production	4
PLNT_S 4940	Internship in Plant Science	3
BIO_SC 2200	General Genetics	4
or PLNT_S 3213	Genetics of Agricultural Plants and Animals	
<b>Total</b>		29-31

## Semester Plan

Refer to the Semester Plan for the BS in Plant Sciences (p. 99).

## BS in Plant Sciences with Emphasis in Turfgrass Science

### Major Program Requirements

Creation and maintenance of high quality turf areas for sporting activities, home lawns, and utility areas are important. Careers are available to protect turf from pests and optimize growth; integrated strategies emphasize conservation of water and other natural resources.

In addition to CAFNR requirements and the university general education (<https://nextcatalog.missouri.edu/academicdegreerequirements/generaleducationrequirements>) and graduation requirements, the Division of Plant Sciences requires the following courses:

Emphasis Area Requirements		22-23
AG_S_M 2340	Pesticide Application Equipment	3
AG_S_M 4460	Irrigation and Drainage	3
PLNT_S 3210	Principles of Weed Science	4
PLNT_S 3355	Introductory Turfgrass Management	3
PLNT_S 4355	Advanced Turfgrass Management	3
P_R_TR 1080	Introduction to Sport Management	3
BIO_SC 2200	General Genetics	4
or PLNT_S 3213	Genetics of Agricultural Plants and Animals	
Emphasis Area Requirements fulfilled by core:		
PLNT_S 3710	Introductory Entomology	3

PLNT_S 3715	Insect Diversity	2
PLNT_S 4500	Biology and Pathogenesis of Plant-Associated Microbes	4
<b>Ornamental Skills (select one)</b>		3
PLNT_S 2210	Ornamental Woody Plants	3
PLNT_S 2215	Ornamental Herbaceous Plants	3
<b>Business Skills (select one)</b>		1-3
PLNT_S 3250	Green Industry Bidding	1
P_R_TR 2281	The Business of Sport	3
P_R_TR 3185	Sports Economics and Finance	3
<b>Total</b>		26-29

## Semester Plan

Refer to the Semester Plan for the BS in Plant Sciences (p. 99).

## Minor in Plant Sciences

A minor in Plant Sciences shall consist of a minimum of 15 hours of formal coursework in Plant Sciences (PS) designated courses. Of the 15 hours selected, a minimum of 12 hours must be numbered 2000 or above, of which at least 9 hours must be numbered 3000 or above.

**Note:** Problems courses, Readings courses, Internship courses and Undergraduate Research courses are not acceptable courses for the Plant Sciences minor, unless approved by the Director for Undergraduate Programs.

## Graduate

## MS in Plant, Insect and Microbial Sciences

### Application and Admission Information

Admission Contact Information

Ms. Christa Smith

1-41 Agriculture Building; Columbia, MO 65211

573-882-3001

### Admission Criteria

Fall deadline: Flexible; January 15 for greatest financial aid considerations

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Minimum GRE score: none set

Minimum GPA: 3.0

Bachelor's degree from an accredited college

Demonstrated capability to perform graduate-level work

### Required Application Materials

To Graduate School:

- All required Graduate School documents

To the Plant, Insect and Microbial Sciences Program (<http://plantsci.missouri.edu/graduate/admissions.cfm>):

- 3 letters of recommendation
- GRE score report
- 1-2 page letter clearly articulating educational and professional goals
- Brief (2 pages) résumé

## Financial Aid from the Program

Financial assistance is available to qualified students at both the MS and PhD levels, as either fellowships or research assistantships. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website (<http://plantsci.missouri.edu/graduate>) or ask the program contact for details.

## Division-Wide Requirements

To satisfy the course requirements for a master's degree, a student must complete:

- A minimum of 30 credit hours from courses numbered 7000 - 9000
- 15 credit hours (towards the 30 credit hour requirement) must be from courses numbered at the 8000 or 9000 level
- 12 credit hours (towards the 30 credit hour requirement) can be satisfied by research, readings and problems courses
- For the Horticulture Program Area, at least 6 credits must be from formal courses, excluding Problems and other independent study courses and only 6 credit hours of research (PLNT\_S 8090) can count towards the 30 credit hour requirement, even though additional hours of research can be taken.

The division-wide course requirements for the master's degree are:

PLNT_S 8010	Professionalism and Ethics	2
Participation in the student seminar series		
PLNT_S 9087	Seminar in Plant Science	1
PLNT_S 7087	Seminar (Must enroll twice)	2
PLNT_S 8090	Thesis Research (1 - 10 credits per semester)	1-10

To satisfy the course requirements for a doctoral degree, a student must complete:

- A minimum of 72 credit hours from courses numbered 7000-9000 (this includes dissertation research credit hours - i.e. PLNT\_S 9090)
- 15 credit hours (towards the 72 hour requirement) must be from courses numbered at the 8000 or 9000 level, exclusive of dissertation research, problems or independent study
- For the Horticulture Program Area, all Doctoral students will have successfully completed the requirements for a master's degree before beginning a doctoral program and no more than 30 hours of dissertation research may be counted towards the 72 hr minimum.

The division-wide requirements for the PhD are:

PLNT_S 8010	Professionalism and Ethics	2
Participation in the student seminar series		
PLNT_S 9087	Seminar in Plant Science (Must enroll twice; only 1 credit counts towards the 15 credit hour requirement of 8000/9000 level courses)	2
PLNT_S 7087	Seminar (Must enroll 3 times)	3
PLNT_S 9090	Dissertation Research (1-10 credits per semester)	1-10

During the Fall and Spring Semesters, MS students must enroll for 9 credits to be considered a full time student. PhD students who have not completed their comprehensive exam must enroll for 9 credits to be considered a full time student.

## Teaching Requirement

With the exception of the Entomology Program Area, all students must participate in an approved teaching opportunity or an approved extension program.

## Satisfactory Rate of Progress

A student shall maintain a minimum grade point average of 3.0. All divisional course requirements (and any additional requirements set by the student's examination committee) shall be completed in a timely manner. All advisers will meet annually with each of their graduate advisees. They will discuss the student's performance, any problems that exist and any suggestions for improvement. The advisor will provide the student and the director of graduate studies with a written summary of the meeting as part of the annual program assessment process.

## Graduate Program Area Requirements

Detailed descriptions of divisional curricula and procedures are available on the division website. (<http://plantsci.missouri.edu/graduate>)

## Crop, Soil and Pest Management

The Crop, Soil and Pest Management program area emphasizes a customized approach towards the course of study. Each student will work with their adviser and graduate committee to develop a course of study best suited to the student's educational and career goals.

## Entomology

The core requirements for the master's degree in entomology program are:

PLNT_S 7710	Systematic Entomology	5
PLNT_S 7820	Principles of Insect Physiology	4
PLNT_S 9810	Insect Ecology	3
One elective formal entomology course		

The core requirements for the PhD degree in Entomology program are:

PLNT_S 7710	Systematic Entomology	5
PLNT_S 7820	Principles of Insect Physiology	4
PLNT_S 9810	Insect Ecology	3
Two elective formal entomology courses		

## Horticulture

The horticulture program area emphasizes a customized approach towards the course of study. Each student will work with their adviser and graduate committee to develop a course of study best suited to the student's educational and career goals.

## Plant Breeding, Genetics and Genomics

The plant breeding, genetics and genomics program area emphasizes a customized approach towards the course of study. Each student will work with their adviser and graduate committee to develop a course of study best suited to the student's educational and career goals.

## Plant Stress Biology

The core requirements for the master's and PhD degrees in the Plant Stress Biology program are:

two Entry Level courses (to be completed in the first year)

Select one course from: 3

PLNT\_S 7315 Crop Physiology

PLNT\_S 7320 Plant Physiology

Select one course from: 3

PLNT\_S 7500 Biology and Pathogenesis of Plant-Associated Microbes

PLNT\_S 8505 Introduction to Plant Stress Biology

PLNT\_S 8530 Research with Plant Stress Agents

## PhD in Plant, Insect and Microbial Sciences

### Application and Admission Information

Admission Contact Information

Ms. Christa Smith

1-41 Agriculture Building; Columbia, MO 65211

573-882-3001

### Admission Criteria

Fall deadline: Flexible; January 15 for greatest financial aid considerations

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Minimum GRE score: none set

Minimum GPA: 3.0

Bachelor's degree from an accredited college

Demonstrated capability to perform graduate-level work

### Required Application Materials

To Graduate School:

- All required Graduate School documents

To the Plant, Insect & Microbial Sciences Program (<http://plantsci.missouri.edu/graduate/admissions.cfm>):

- 3 letters of recommendation
- GRE score report
- 1-2 page letter clearly articulating educational and professional goals
- Brief (2 pages) resume
- Financial Aid from the Program

Financial assistance is available to qualified students at both the MS and PhD levels, as either fellowships or research assistantships. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Division-Wide Requirements

To satisfy the course requirements for a master's degree, a student must complete:

- A minimum of 30 credit hours from courses numbered 7000 - 9000
- 15 credit hours (towards the 30 credit hour requirement) must be from courses numbered at the 8000 or 9000 level
- 12 credit hours (towards the 30 credit hour requirement) can be satisfied by research, readings and problems courses
- For the Horticulture Program Area, at least 6 credits must be from formal courses, excluding Problems and other independent study courses and only 6 credit hours of research (PLNT\_S 8090) can count towards the 30 credit hour requirement, even though additional hours of research can be taken.

The division-wide course requirements for the master's degree are:

PLNT_S 8010	Professionalism and Ethics	2
Participation in the student seminar series		
PLNT_S 9087	Seminar in Plant Science	1
PLNT_S 7087	Seminar (Must enroll twice)	2
PLNT_S 8090	Thesis Research (1 - 10 credits per semester)	1-10

To satisfy the course requirements for a doctoral degree, a student must complete:

- A minimum of 72 credit hours from courses numbered 7000-9000 (this includes dissertation research credit hours - i.e. PLNT\_S 9090)
- 15 credit hours (towards the 72 hour requirement) must be from courses numbered at the 8000 or 9000 level, exclusive of dissertation research, problems or independent study
- For the Horticulture Program Area, all Doctoral students will have successfully completed the requirements for a master's degree before beginning a doctoral program and no more than 30 hours of dissertation research may be counted towards the 72 hr minimum.

The division-wide requirements for the PhD are:

PLNT_S 8010	Professionalism and Ethics	2
Participation in the student seminar series		
PLNT_S 9087	Seminar in Plant Science (Must enroll twice; only 1 credit counts towards the 15 credit hour requirement of 8000/9000 level courses)	2
PLNT_S 7087	Seminar (Must enroll 3 times)	3
PLNT_S 9090	Dissertation Research (1-10 credits per semester)	1-10

During the Fall and Spring Semesters, MS students must enroll for 9 credits to be considered a full time student. PhD students who have not completed their comprehensive exam must enroll for 9 credits to be considered a full time student.

### Teaching Requirement

With the exception of the Entomology Program Area, all students must participate in an approved teaching opportunity or an approved extension program.

### Satisfactory Rate of Progress

A student shall maintain a minimum grade point average of 3.0. All divisional course requirements (and any additional requirements set by the student's examination committee) shall be completed in a timely manner. All advisers will meet annually with each of their graduate advisees. They will discuss the student's performance, any problems that exist and any suggestions for improvement. The adviser will provide the student and the director of graduate studies with a written summary of the meeting as part of the annual program assessment process.



## Graduate Program Area Requirements

Detailed descriptions of divisional curricula and procedures are available on the division website. (<http://plantsci.missouri.edu/graduate>)

### Crop, Soil and Pest Management

The Crop, Soil and Pest Management program area emphasizes a customized approach towards the course of study. Each student will work with their adviser and graduate committee to develop a course of study best suited to the student's educational and career goals.

### Entomology

The core requirements for the master's degree in entomology program are:

PLNT_S 7710	Systematic Entomology	5
PLNT_S 7820	Principles of Insect Physiology	4
PLNT_S 9810	Insect Ecology	3
One elective formal entomology course		

The core requirements for the PhD degree in Entomology program are:

PLNT_S 7710	Systematic Entomology	5
PLNT_S 7820	Principles of Insect Physiology	4
PLNT_S 9810	Insect Ecology	3
Two elective formal entomology courses		

### Horticulture

The horticulture program area emphasizes a customized approach towards the course of study. Each student will work with their advisor and graduate committee to develop a course of study best suited to the student's educational and career goals.

### Plant Breeding, Genetics and Genomics

The plant breeding, genetics and genomics program area emphasizes a customized approach towards the course of study. Each student will work with their advisor and graduate committee to develop a course of study best suited to the student's educational and career goals.

### Plant Stress Biology

The core requirements for the master's and PhD degrees in the Plant Stress Biology program are:

two Entry Level courses (to be completed in the first year)

Select one course from: 3

PLNT\_S 7315 Crop Physiology

PLNT\_S 7320 Plant Physiology

Select one course from: 3

PLNT\_S 7500 Biology and Pathogenesis of Plant-Associated Microbes

PLNT\_S 8505 Introduction to Plant Stress Biology

PLNT\_S 8530 Research with Plant Stress Agents

## Rural Sociology

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College of Agriculture, Food and Natural Resources  
David O'Brien, Chair  
109 Gentry Hall  
(573) 882-0392  
ObrienDJ@missouri.edu  
dass.missouri.edu/ruralsoc/

Carol Swaim, Administrative Assistant  
121 Gentry Hall  
(573) 882-7451  
swaimc@missouri.edu

The Department of Rural Sociology participates in the Bachelor of Science in Agriculture degree offered by the College of Agriculture, Food and Natural Resources and offers a minor in rural sociology. For information about the agriculture degree, see the Agriculture degree page. The Department of Rural Sociology also offers graduate degrees.

### Faculty

**Professor** D. J. O'Brien#, J. S. Rikoon\*\*, J. I. Stallmann\*\*  
**Associate Professor** J. L. Gilles\*\*, M. Grigsby\*\*  
**Assistant Professor** M. Hendrickson\*  
**Extension Assistant Professor** J. Adams\*, S. Jeanetta\*, M. S. Leuci\*  
**Research Assistant Professor** C. Fulcher\*  
**Associate Professor Emeritus** K. E. Pigg\*  
**Professor Emeritus** R. R. Campbell\*, M. F. Nolan\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Minor in Rural Sociology (p. 106)

Advisor: Mary Grigsby  
Grigsbym@missouri.edu

Administrative Assistant: Carol Swaim  
Swaimc@missouri.edu  
(573)882-7451  
<http://dass.missouri.edu/ruralsoc/>

### Graduate

121 Gentry Hall  
573-882-7451  
<http://dass.missouri.edu/ruralsoc/>

**Director of Graduate Studies:** Jere Gilles

- MS in Rural Sociology (p. 106)
- PhD in Rural Sociology (p. 107)

The Department of Rural Sociology offers the MS and PhD degrees. The program consists of broad training in sociological theory and methodology with attention to application and policy issues.

Students entering with a bachelor's degree normally are admitted into the master's program even if they are going on to a PhD, exceptional students may be admitted to the Masters/PhD program. Up to 12 hours of makeup work may be required for students who have less than adequate undergraduate preparation in the social sciences.

### Specializations

Areas of specialization in the department are: sustainable development, community facilitation, and analytical processes

### Financial Aid from the Program

Request for financial support is made by the student at the time of application. Most of the financial support is for research assistantships. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Undergraduate

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### Minor in Rural Sociology

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The rural sociology undergraduate minor requires 15 credits in rural sociology courses. Nine credits must be above the 2000 level. The specific combination of courses must be approved by a department advisor.

## Graduate

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### MS in Rural Sociology

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Admission Contact: Carol Swaim  
Department of Rural Sociology  
121 Gentry Hall; Columbia, MO 65211  
573-882-7451

### Admission Criteria

Fall deadline: N/A

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
84	570

- Minimum GRE score: none set
- Minimum GPA: 3.0 for domestic applicants
- An undergraduate and/or graduate degree in a social science or equivalent is desirable
- Basic understanding of statistics

**Note:** Students entering with a bachelor's degree normally are admitted into the master's program even if they are going on to a PhD, exceptional students may be admitted to the Masters/PhD program. Up to 12 hours of makeup work may be required for students who have less than adequate undergraduate preparation in the social sciences.

### Required Application Materials

*To Graduate School:*

- All required Graduate School documents

*To the Rural Sociology Program:*

- Departmental application
- GRE score report
- 3 letters of recommendation

## Degree Completion Requirements - Master's Degree

A traditional 30-hour master's degree with thesis is offered. Students choosing the 30-hour MS degree may expect to continue toward a PhD. Required courses for this degree Rural Sociology 8130 and 8510 and Sociology 8100. Masters students must produce a research product or thesis.

## Degree Completion Requirements - Professional Master's Degree

This degree is designed for persons who wish to have the training needed to carry out applied research, policy analysis and program evaluation in a government or business. The 39-credit program includes a six- to eight-credit- hour internship.

## Specializations

There are two options for the professional degree — community facilitation and analytical processes for community.

## Course Requirements

**Two courses required for both options:**

RU_SOC 7325	American Community Studies	3
RU_SOC 8510	Research Methods and Design	3

**Students for both options must also take 3 courses out of the Rural Sociology core:**

RU_SOC 7120	Social Statistics	
RU_SOC 7370	Environmental Sociology	
RU_SOC 7335	Social Change and Development	
RU_SOC 7446	Community Social Structure	
RU_SOC 8130	Advanced Social Statistics	
RU_SOC 8287	Seminar on Sustainable Development	
RU_SOC 8435	Political Ecology	
RU_SOC 8444	Agriculture, Food and Community	
RU_SOC 8447	Seminar on Contemporary Issues in Rural Sociology	
RU_SOC 8610	Economic and Sociological Approaches to Collective Action	

**Students wishing to go on for a PhD must complete:**

RU_SOC 8130	Advanced Social Statistics	3
RU_SOC 9837	Seminar in Multivariate Analysis Techniques	3

**Required courses for the community facilitation option are:**

RU_SOC 7341	Building Communities from the Grassroots	3
PUB_AF 8610	Group Dynamics and Conflict Resolution	3
PUB_AF 8630	Organizational Change in a Community and Global Context	3

**Required courses for analytical processes option are:**

RU_SOC 8130	Advanced Social Statistics	3
AG_EC 8350	Regional Development Issues and Analysis	3

More details can be found by referring to the on line graduate student handbook at <http://dass.missouri.edu/ruralsoc/grad/>.

## Practical experience

Each student will have a practical experience through an internship doing applied social science work with a private or a public agency. The type of internship will vary according to student needs and interests, but it should be the equivalent of at least three months of full-time employment. Students will receive six to eight credits for this experience and will prepare a written report of their experience. Previous experience may be substituted for part of this requirement.

## For More Information

For detailed information about Rural Sociology Master's programs see the Rural Sociology Graduate Handbook <http://www.dass.missouri.edu/ruralsoc/grad/grad-handbook12.pdf>.

## PhD in Rural Sociology

Admission Contact: Carol Swaim  
121 Gentry Hall; Columbia, MO 65211  
573-882-7451

## Admission and Recommended Prerequisites

Admission to the PhD program is determined by the admissions and awards committee. Although it is desirable that entering students have a strong background in sociology, students of high merit who do not have such a background are encouraged to apply. Such applicants may be required to take such graduate-level work as is necessary to remedy deficiencies in their background.

## Admission Criteria

Fall deadline: N/A

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
84	570

- Minimum GRE score: none set
- Minimum GPA: 3.0 for domestic applicants
- An undergraduate and/or graduate degree in a social science or equivalent is desirable
- Basic understanding of statistics

**Note:** Students entering with a bachelor's degree normally are admitted into the master's program even if they are going on to a PhD, exceptional students may be admitted to the Masters/PhD program. Up to 12 hours of makeup work may be required for students who have less than adequate undergraduate preparation in the social sciences.

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## Required Application Materials

*To Graduate School:*

- All required Graduate School documents

*To the Rural Sociology Program:*

- Departmental application
- GRE score report
- 3 letters of recommendation

## Degree Completion Requirements

The focus of the doctoral program in Rural Sociology is sustainable development. Besides the three core of courses for listed for the traditional masters degree above all graduate students, students in the PhD program take a core consisting of nine courses listed in the Rural Sociology Graduate Handbook (<http://dass.missouri.edu/ruralsoc/grad>) and complete an area of area of professional concentration of a minimum of 12 credit hours that is normally an MU graduate certificate or graduate minor.

## Science and Agricultural Journalism

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Sharon Wood-Turley, Program Chair  
112 Gentry Hall  
(573) 882-7645  
Fax: (573) 884-4444  
swt@missouri.edu

The College of Agriculture, Food and Natural Resources, in cooperation with the Missouri School of Journalism, offers a degree program in Science and Agricultural Journalism. This curriculum prepares students to communicate about issues related to science and agriculture, including: the food system (including everything from traditional production agriculture to grape and wine production), natural resources, the life sciences, the environment, and medical and agricultural biotechnology.

Graduates are prepared to enter a wide variety of media professions including: public relations, marketing, multimedia/web production, photography, magazine writing, reporting and broadcast.

Students must meet all GPA requirements of the Missouri School of Journalism. Check with your advisor for details. The department offers the Bachelor of Science with a major in Science and Agricultural Journalism.

### Faculty

**Assistant Teaching Professor** W. Allen\*, S. Wood-Turley  
**Instructor** L. Sowers, N. Furstenau

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 109)
- BS in Science and Agricultural Journalism (p. 110)

### Graduate

While the College of Agriculture, Food and Natural Resources does not offer a graduate degree in science and agricultural journalism, the College does offer graduate degrees and certificates in a number of disciplinary areas. The catalog provides a complete list of these degree options (p. 5) at the University of Missouri, including the School of Journalism (p. 552).

## Undergraduate

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## Department Level Requirements - Science and Agricultural Journalism

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There are no departmental requirements for this degree. Please see the BS in Science and Agricultural Journalism (p. 110) page for degree requirements.

### Major Program Requirements and Options in Science and Agricultural Journalism

When you major in science and agricultural journalism, you gain access to the strengths of two nationally renowned programs: the Missouri School of Journalism and the MU College of Agriculture, Food and Natural Resources.

The Science and Agricultural Journalism Program provides you with five career tracks to select from:

(Note: Tracks do not appear on transcripts or diplomas.)

- Agricultural Marketing
- Agricultural Science
- Conservation and Environmental Sciences
- Food and Wine
- Science Journalism

In addition, you can focus on one of the following emphasis areas in the Journalism School, or select courses from a combination of:

- Convergence Journalism (a combination of media skills)
- Magazine Journalism
- Photojournalism
- Print and Digital News
- Radio-Television Journalism
- Strategic Communications (Advertising and Public Relations)

### Agricultural Marketing Track

The Agricultural Marketing Track prepares students for careers in the agribusiness, government and other sectors where the specialized skills of writing, multimedia, marketing and strategic communications are in high demand. This track includes courses within the College of Agriculture, Food and Natural Resources in the Ag Marketing System, Ag Sales, Fundamentals of Entrepreneurship, New Products Marketing, International Food Trade and Policy, Agribusiness Finance and Agribusiness Management Strategy.

### Agricultural Science Track

The Agricultural Science Track prepares students for careers in the news media, agricultural industry, government and other sectors where an in-depth knowledge of plant, animal and food science is in high demand along with specialized skills in writing, multimedia and other forms of communication. This track includes courses within the college of Agriculture, Food and Natural Resources in Plant Growth and Culture; Genetics of Ag Plants and Animals; Animal Science; Global Animal Agriculture; Food Science and Nutrition; Meat Classification, Grading and Judging; Elements of Food Microbiology; and Principles of Meat Science.

## Conservation and Environmental Sciences Track

The Conservation and Environmental Sciences Track prepares students for careers writing about the environment, energy, conservation and nature. From climate change, endangered species and clean water to wildlife, forestry and outdoor activities - students in this track will gain an understanding of the complex issues on these beats and the complex job of communicating about them. This track includes a specialized course in Field Reporting and can include a trip to the annual national meeting of the Society of Environmental Journalists, a non-advocacy group. Other courses within the College of Agriculture, Food and Natural Resources in this track include Introduction to Environmental Science, Ecology and Renewable Resource Management; Introduction to Meteorology; Climates of the World; Soils and the Environment; Environmental Economics and Policy; and Water Quality and Natural Resources Management.

## Food and Wine Track

Interest in food and wine is growing among consumers and the news media industry. Also, dairy, meat and wine are major industries in Missouri. This track prepares students for journalism and strategic communications careers in this increasingly important sector. The Food and Wine Track includes a specialized course in covering food and wine. Other courses within the College of Agriculture, Food and Natural Resources in this track include Introduction to Food Science, Elements of Food Microbiology, Introduction to Viticulture (grape production) and Enology (wine production), Grapes and Wines of the World, Principles of Wine Production and Principles of Wine Cellar Operation.

## Science Journalism Track

The Science Journalism Track prepares students for careers covering news and information on the frontiers of science - from biotechnology and nanotechnology to astronomy, climate, geology and the human brain. Students in this track will gain an understanding of the scientific, social, political and economic forces that shape the world of science and technology today, a world that increasingly affects the way we live and learn. This track includes such courses as Explaining Research; Earth Systems and Global Change; Introduction to Meteorology; Physics for Poets; Mind, Brain and Behavior; Science, Technology and Society; and Readings in Science Journalism. This track will enable excellent preparation for students in both journalism and strategic communications.

## BS in Science and Agricultural Journalism

### Major Program Requirements

All students must complete 42 hours of Journalism coursework, 6 hours of Science and Agricultural Journalism courses, and 18 hours in one of the Science and Agricultural Journalism tracks. In addition, internship experience is strongly encouraged. Refer to the Degree Level Requirements (p. 109), as well as university general education (p. 18) requirements. A minimum of 120 credit hours is required for a B.S. in Science and Agricultural Journalism.

<b>Major core requirements</b>	<b>66</b>
<b>Journalism</b>	
JOURN 1100 Principles of American Journalism	3

JOURN 2000	Cross-Cultural Journalism	3
JOURN 2100	News	3
JOURN 2150	Fundamentals of Multimedia Journalism	3
JOURN 4000	Communications Law	3
JOURN 4200	Principles of Strategic Communication	3
JOURN 4400	Introduction to News Editing	2
JOURN 4406	News Editing	3
or JOURN 4408	Magazine Editing	
JOURN 4450	News Reporting	3
<b>Journalism electives</b>		<b>16</b>

### Science and Agricultural Journalism

SCI_AG_J 1160	Introduction to Science and Agricultural Journalism	3
SCI_AG_J 4970	Agriculture and the Media Senior Seminar Capstone	3
or SCI_AG_J 4414	Field Reporting on the Food System and Environment	
or SCI_AG_J 4940	Internships in Science and Agricultural Journalism	

### Science and Agricultural Journalism Tracks 18

(Note: Tracks are not listed on transcripts or diplomas.)

## Semester Plan

Below is a sample plan of study, semester by semester. Your actual plan may vary based on course choices where options are available. The plan shown is for a student completing the magazine writing interest area and the conservation/environment track.

First Year					
Fall	Credits	Spring	Credits	Summer	Credits
SCI_AG_J 1160	3	AG_EC 1042	3	MATH 1100	3
NAT_R 1060	3	BIO_SC 1020	2		
ENGLISH 1000	3	COMMUN 1200	3		
AG_EC 1041	3	JOURN 1100	3		
BIO_SC 1010	3	HIST 1200	3		
	<b>15</b>		<b>14</b>		<b>3</b>
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
SCI_AG_J 3240	3	AG_EC 2223	3	CHEM 1100	3
JOURN 2000	3	AG_EC 2070	3		
AG_ED 2220	3	JOURN 2100	3		
ENV_SC 1100	3	SCI_AG_J 3210	3		
JOURN 2150	3	ESC_PS 4170	3		
	<b>15</b>		<b>15</b>		<b>3</b>
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
JOURN 4000	3	JOURN 4550	3	JOURN 4940	2
JOURN 4450	3	SCI_AG_J 4415	3		

JOURN 4506	3	SCI_AG_J 4480	3	
ATM_SC 3600	3	ENV_SC 3330	3	
	<b>12</b>		<b>12</b>	<b>2</b>
<b>Fourth Year</b>				
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>	
AN_SCI 2110	2	SCI_AG_J 4970	3	
JOURN 4408	3	PLNT_S 2110	3	
SCI_AG_J 4414	3	JOURN 4984	3	
JOURN 4464	3	JOURN 4510	3	
RU_SOC 1120	3	RU_SOC 4370	3	
	<b>14</b>		<b>15</b>	
Total Credits: 120				

## Soil, Environmental and Atmospheric Sciences

Anthony R. Lupo, Chair  
Soil, Environmental and Atmospheric Sciences  
School of Natural Resources  
College of Agriculture, Food, and Natural Resources  
302 Anheuser-Busch Natural Resources Building  
(573) 882-6301

<http://www.snr.missouri.edu/seas/>

The Department of Soil, Environmental and Atmospheric Sciences brings together students, staff and faculty working in the fields of environmental, atmospheric and soil sciences. Excellent opportunities exist for students wishing to explore these exciting areas of study. The department offers BS, MS and PhD degrees with a major in Soil, Environmental and Atmospheric Sciences. A minor with options in Environmental Science, Soil Science, or Atmospheric Science, is also available.

### Faculty

**Professor** S. H. Anderson\*\*, C. J. Gantzer\*\*, A. R. Lupo\*\*, P. P. Motavalli\*\*

**Associate Professor** N. I. Fox\*\*, K. W. Goyne\*\*, P. S. Market\*\*, R. J. Miles\*\*

**Assistant Professor** J. Hubbart\*

**Adjunct Professor** R. J. Kremer\*\*, E. J. Sadler\*, P. C. Scharf\*, W. G. Stevens\*, C. K. Wikle\*

**Adjunct Associate Professor** F. Eivazi\*, N. R. Kitchen\*\*, J. Yang\*

**Adjunct Assistant Professor** J. O. Adegoke\*, C. Baffaut\*, R. N. Lerch\*\*, F. J. Young\*

**Associate Professor** R. P. Udawatta\*\*

**Instructor** E. Aldrich, C. Frey

**Extension Assistant Professor** P. E. Guinan\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 113)
- BS in Soil, Environmental and Atmospheric Sciences (p. 113)
  - with emphasis in Atmospheric Science (p. 114)
  - with emphasis in Environmental Science (p. 115)
  - with emphasis in Environmental Soil Science (p. 117)
  - with emphasis in Soil Resource Management (p. 120)
- Minor in Soil, Environmental and Atmospheric Sciences (p. 121)

### Dual Degree - Geological Sciences and Soil, Environmental and Atmospheric Sciences

The Department of Soil, Environmental and Atmospheric Sciences and the Department of Geological Sciences offer a dual BS in Geology and in

Soil, Environmental and Atmospheric Sciences with an emphasis in Soil Resource Management. The dual degree program requires 132 credits for graduation. For more information on the dual degree program, contact an advisor in the Department of Soil, Environmental and Atmospheric Sciences or the Department of Geological Sciences.

### Dual Degree - Biochemistry and Soil, Environmental and Atmospheric Sciences

The Department of Soil, Environmental and Atmospheric Sciences and the Division of Biochemistry offer a dual BS degree in Biochemistry and in Soil, Environmental and Atmospheric Sciences with an emphasis in Environmental Science. The dual degree program requires 134 credits for graduation. For more information on the dual degree program, contact an advisor in the Department of Soil, Environmental and Atmospheric Sciences or the Division of Biochemistry.

### Dual Degree - Forestry and Soil, Environmental and Atmospheric Sciences

The Department of Soil, Environmental and Atmospheric Sciences and the Department of Forestry offer a dual degree in Forestry and in Soil, Environmental and Atmospheric Science with an emphasis in Environmental Science. The dual degree requires 136 credits for graduation. For more information on the dual degree program, contact an advisor in the Department of Soil, Environmental and Atmospheric Sciences or the Department of Forestry.

### Graduate

School of Natural Resources  
Soil, Environmental and Atmospheric Sciences  
302 Anheuser-Busch Natural Resources Building  
573-882-3436  
<http://www.snr.missouri.edu/seas/academics/graduate-program.php>

#### Emphasis Area Coordinator for Graduate Program:

Dr. Peter P. Motavalli  
Department of Soil, Environmental and Atmospheric Sciences  
University of Missouri  
302 Anheuser-Busch Natural Resources Building  
Columbia, MO 65211 USA  
Tel. no. 573-884-3212  
Email: [motavallip@missouri.edu](mailto:motavallip@missouri.edu)

Graduate study at the University of Missouri (MU) in soil, environmental, and atmospheric sciences is designed to prepare students for professional careers in research, teaching or practical application of the principles of soil, environmental and atmospheric sciences (SEAS).

As of the fall 2013 semester, options for graduate study in SEAS will be offered through the MS in Natural Resources with an emphasis in SEAS (p. 84) and the PhD in Natural Resources with an emphasis in SEAS (p. 90). Focus areas in soil science, environmental science or atmospheric science are available through these options. Details on both degree programs, including recommended preparation, admission criteria, required application materials, degree requirements and financial aid, are provided in the graduate tab of the Natural Resources section of the catalog under the College of Agriculture, Food and Natural Resources.



## Graduate Focus Areas

### Atmospheric Science

Atmospheric science students participate in an area of research such as dynamic and physical meteorology, general circulation, global climate change, severe storms, remote sensing and applied climatology with emphasis on environmental and socioeconomic impacts.

The program has a specialized computer data library that includes extensive long-term global and local observational records to support thesis and dissertation research. There are opportunities for joint research programs with the National Center for Atmospheric Research.

### Environmental Science

Environmental science students may participate in environmental quality, hydrology, watershed management, and water quality emphasis areas. State-of-the-art equipment for chemical, biological and physical analysis of water and earth materials is available for use in laboratories maintained by the SEAS Department in the School of Natural Resources.

The program has a working scale-nested watershed study spanning native lands as well as agricultural, and urban environments, thus supplying an excellent outdoor teaching and research laboratory.

### Soil Science

Soil science students may participate in one of the following emphasis areas: environmental quality, pedology, soil chemistry and biochemistry, soil microbiology, soil physics and conservation, soil management, or soil fertility and plant nutrition.

State-of-the-art equipment for chemical, biological and physical analysis of soils is available for use in laboratories maintained by the SEAS Department in the School of Natural Resources. Access to additional chemical analysis equipment, computing facilities, digital imaging equipment, field facilities, greenhouse space, radiochemistry and scanning electron microscopes is available within the University of Missouri.

### Financial Aid from the Program

Check the program website (<http://www.snr.missouri.edu/seas/academics/graduate-program.php>) or contact the program for details on scholarships or graduate assistantships that may be available.

## Undergraduate

### Department Level Requirements - Soil, Environmental and Atmospheric Sciences

There are no requirements at the department level for this degree. Please see the BS in Soil, Environmental and Atmospheric Sciences (p. 113) page for the major program requirements.

## BS in Soil, Environmental and Atmospheric Sciences

### Major Program Requirements

In addition to university general education (p. 18) requirements, students must meet school requirements, as well as the degree requirements below:

#### Major core requirements

##### Social and behavioral sciences

Economics/business elective	3
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##### Math reasoning skills <sup>1</sup>

MATH 1400	Calculus for Social and Life Sciences I	3-5
or MATH 1500	Analytic Geometry and Calculus I	

##### Computer science

AFNR 1120	Computing and Information Technology	2
AFNR 2120	Working with Data Using Excel	1

##### Major capstone experience

ATM_SC 4990	Daily Analysis and Forecast Interpretation	3
or ENV_SC 4320	Hydrologic and Water Quality Modeling	
or SOIL 4320	Genesis of Soil Landscapes	

##### Soil, environmental, and atmospheric sciences

ATM_SC 1050	Introductory Meteorology	3
SOIL 2100	Introduction to Soils	3
or SOIL 3290	Soils and the Environment	
or ENV_SC 1100	Introduction to Environmental Science	

ATM SC electives	5
OR SOIL electives	

OR ENV SC electives	
---------------------	--

##### Major core quantitative skills

STAT 1400	Elementary Statistics for Life Sciences	3
or STAT 2530	Statistical Methods in Natural Resources	

##### Major core science requirements

CHEM 1320	College Chemistry I	4
Science electives		9

Total Credits	39-41
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### Semester Plan

Refer to the Semester Plans for the BS in Soil, Environmental and Atmospheric Sciences designed for the emphasis areas of Atmospheric Sciences (p. 114), Environmental Science (p. 115), or Soil Resource Management (p. 120).

# BS in Soil, Environmental and Atmospheric Sciences with Emphasis in Atmospheric Science

## Major Program Requirements

In addition to university general education (<https://nextcatalog.missouri.edu/academicdegree/requirements/generaleducationrequirements>) requirements, students must meet school requirements (<https://nextcatalog.missouri.edu/undergraduategraduate/collegeofagriculturefoodandnaturalresources/soilenvironmentalandatmosphericsciences/department-level-requirements>), as well as the degree requirements below:

### Emphasis in Atmospheric Science

Study of atmospheric science prepares the student for employment as a professional meteorologist in the National Weather Service, the military and other government agencies as well as meteorological consulting firms, broadcast outlets and industry. The emphasis in atmospheric science adheres to federal requirements for employment as a meteorologist, yet emphasizes interdisciplinary studies in natural resources leading to specialization in operational meteorology or environmental science. The course of study also serves as a preparatory curriculum for advanced study in atmospheric science. A major in soil, environmental and atmospheric sciences with an emphasis in atmospheric science requires 128 credits for graduation.

#### Emphasis core requirements

#### Emphasis general requirements

#### Math reasoning skills

MATH 1500	Analytic Geometry and Calculus I	5
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#### Communications

COMMUN 1200	Public Speaking	3
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Select one from the following or contact advisor for other selections: 3

SCI_AG_J 3210	Fundamentals of Communications
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ENGLSH 2030	Professional Writing
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COMMUN 3575	Business and Professional Communication
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Those desiring a career in broadcast meteorology should consider the following courses or contact an advisor for other selections:

COMMUN 2100	Media Communication in Society
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COMMUN 2315	Basic Audio Production and Performance
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COMMUN 3390	Digital Production I
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COMMUN 3395	Digital Production II
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THEATR 1400	Acting for Non-Majors
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#### Senior capstone experience

ATM_SC 4320	Atmospheric Dynamics	4
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#### Emphasis core quantitative skills

#### Statistics

STAT 1400	Elementary Statistics for Life Sciences	3
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#### Quantitative electives

ATM_SC 4800	Numerical Methods in Atmospheric Science and Natural Resources	3
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MATH 1160	Precalculus Mathematics	5
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MATH 1700	Calculus II	5
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MATH 2300	Calculus III	3
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MATH 4100	Differential Equations	3
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#### Emphasis core science requirements

PHYSCS 2750	University Physics I	5
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PHYSCS 2760	University Physics II	5
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#### Other emphasis core requirements

ATM_SC 4310	Atmospheric Thermodynamics	4
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ATM_SC 4320	Atmospheric Dynamics	4
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ATM_SC 4350	Mesoscale Meteorology and Dynamics	3
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ATM_SC 4510	Remote Sensing for Meteorology and Natural Resources	3
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ATM_SC 4550	Atmospheric Physics	3
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ATM_SC 4650	Long-Range Forecasting	3
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ATM_SC 4710	Synoptic Meteorology I	4
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ATM_SC 4720	Synoptic Meteorology II	4
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Credits from general, quantitative, science, and atmospheric science to complete 128 credits		54
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Total Credits		129
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## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	SOCIOL 1000 or PSYCH 1000	3
ENGLSH 1000	3	COMMUN 1200	3
HIST 1100 or POL_SC 1100	3	MATH 1700	5
ATM_SC 1050	3	ATM_SC 2720	1
Humanities Elective	3	Computer Science Course	3
	17		15
Second Year			
Fall	Credits	Spring	Credits
AG_EC 1041 or 1042	3	ATM_SC 3600	3
MATH 2300	3	MATH 4100	3
PHYSCS 2750	5	PHYSCS 2760	5
Elective	3	STAT 1300 or 1400	3
Humanities Elective	3		
	17		14
Third Year			
Fall	Credits	Spring	Credits
ATM_SC 4710	4	ATM_SC 4720	4
ATM_SC 4550	3	CHEM 1320	4

Science Elective	3	ATM_SC 4590	3
CMP_SC 1040 or 1050	3	Social Science Elective	3
Humanities Elective	3	Humanities Elective	3
	<b>16</b>		<b>17</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ATM_SC 4310	4	ATM_SC 4320	4
Atmospheric Science Elective	6	ATM_SC 4990	3
Elective	3	Atmospheric Science Elective	6
Computer Programming or Geographic Information Sciences Course	3	Other Elective	3
	<b>16</b>		<b>16</b>
Total Credits: 128			

## BS in Soil, Environmental and Atmospheric Sciences with Emphasis in Environmental Science

### Major Program Requirements

In addition to university general education (<https://nextcatalog.missouri.edu/academicdegree/requirements/generaleducationrequirements>) requirements, students must meet school requirements as well as the degree requirements below:

### Emphasis in Environmental Science

Addressing environmental problems such as water and air quality, waste management and land use issues often requires an interdisciplinary science education as well as an understanding of the social and economic context of the problem. The environmental science emphasis is designed to prepare students for careers as environmental professionals.

Within the environmental science emphasis, students can choose one of three tracks:

- water quality
- land management
- air quality

Students in all tracks take a mixture of natural and applied science courses such as ecology, soil science, forestry, atmospheric science, and fisheries and wildlife.

Other required classes provide students with technical and outreach skills such as geographical information systems (GIS) and additional communications courses, to prepare for work in environmental careers. Students also gain hands-on experience in their field of interest through off-campus internships and practical courses. Each of the tracks requires a 3-credit practical internship in environmental science. Students must complete 128 credits to graduate, including 21-22 credits in the water quality, land management or air quality track.

Among the skills and abilities students develop as graduates with an environmental science emphasis are:

- Understanding of ecosystems and the factors affecting environmental processes and problems

- Facility with environmental monitoring techniques and instrumentation
- Knowledge of technologies and methods for remediation of degraded environments
- Capacity to effectively communicate and educate others about the environment

### Emphasis core general requirements

<b>Departmental Quantitative Skills</b>	<b>3</b>	
MATH 1400	Calculus for Social and Life Sciences I	3
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II (recommended elective for Hydrology Track)	5

### Departmental Sciences 29-30

Biological science	15	
BIO_SC 1200	General Botany with Laboratory	5
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
BIO_SC 3650	General Ecology	5
or FOREST 4320	Forest Ecology	
Chemistry	3	
CHEM 1330	College Chemistry II	4
Recommended electives -		
CHEM 2030	Survey of Organic Chemistry	3
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
Geology	4	
GEOL 1100	Principles of Geology with Laboratory	4
or GEOL 1200	Environmental Geology with Laboratory	
GEOL 1200	Environmental Geology with Laboratory	4
Physics	4-5	
ENV_SC 4305	Environmental Soil Physics	3
& ENV_SC 4306	and Environmental Soil Physics Laboratory	
or PHYSCS 1210	College Physics I	
ENV_SC 4306	Environmental Soil Physics Laboratory	2
PHYSCS 1210	College Physics I	4
PHYSCS 2750	University Physics I	5
Recommended electives for Hydrology Track -		
PHYSCS 1220	College Physics II	4
PHYSCS 2760	University Physics II	5
Policy/Regulation	3	
NAT_R 4353	Natural Resource Policy/Administration	3
or CV_ENG 4250	Environmental Regulatory Compliance	
CV_ENG 4250	Environmental Regulatory Compliance	3
<b>Departmental Requirements</b>	<b>23</b>	
Atmospheric Sciences/Soil Science	8	
ATM_SC 1050	Introductory Meteorology	3
SOIL 2100	Introduction to Soils	3
SOIL 2106	Soil Science Laboratory	2
Computer Science		
AFNR 1111	Computing and Information Systems I	3
CMP_SC 1040	Introduction to Problem Solving and Programming	3
CMP_SC 1050	Algorithm Design and Programming I	3

NAT_R 4325	Introduction to Geographic Information Systems	3
GEOG 3040	Introduction to Geographic Information Systems GIS	3
Environmental Science Emphasis Area Requirements		9
ENV_SC 1100	Introduction to Environmental Science	3
ENV_SC 3290	Soils and the Environment	3
ENV_SC 3500	Pollutant Fate and Transport	3
Capstone Experience		3
ENV_SC 4320	Hydrologic and Water Quality Modeling	3

**Electives** 12-14

**Hydrology Track** 24-25

FOREST 4390	Watershed Management and Water Quality	3
NAT_R 3290	Hydrologic Measurement Techniques	1
ENV_SC 4940	Environmental Science Internship	1-99

Select 6 classes (18 credit hours) from the following list (must take at least one course from ENV\_SC or SOIL and a course from another department)

AG_S_M 4420	Surface Water Management	3
ATM_SC 4400	Micrometeorology	3
ATM_SC 4520	Environmental Biophysics	3
ATM_SC 4590	Radar Meteorology	3
BIOL_EN 4150	Soil and Water Conservation Engineering	3
CV_ENG 3200	Fundamentals of Environmental Engineering	4
CV_ENG 3700	Fluid Mechanics	3
CV_ENG 3702	Hydrology	4
ENV_SC 4305	Environmental Soil Physics	3
ENV_SC 4306	Environmental Soil Physics Laboratory	2
ENV_SC 4318	Environmental Soil Chemistry	3
F_W 3400	Water Quality and Natural Resource Management	3
GEOG 3630	Earth Surface Systems	3
GEOG 4630	River and Stream Dynamics	3
GEOL 4100	Groundwater Hydrology	3
SOIL 4308	Soil Conservation	3
SOIL 4320	Genesis of Soil Landscapes	4

**Land Management Track** 24-25

ENV_SC 3330	Environmental Land Use Management	3
ENV_SC 4940	Environmental Science Internship	1-99

Select 6 classes (18 credit hours) from the following list (must take at least one course from ENV\_SC or SOIL and a course from another department)

AG_S_M 4360	Precision Agriculture Science and Technology	3
AG_S_M 4420	Surface Water Management	3
ATM_SC 3600	Climates of the World	3
ATM_SC 4400	Micrometeorology	3
BIOL_EN 4150	Soil and Water Conservation Engineering	3
CV_ENG 4200	Remote Sensing of the Environment	3
ENV_SC 4305	Environmental Soil Physics	3
ENV_SC 4306	Environmental Soil Physics Laboratory	2
ENV_SC 4312	Environmental Soil Microbiology	3
ENV_SC 4318	Environmental Soil Chemistry	3
F_W 4800	Environmental Toxicology	3

FOREST 3207	Forest Fire Control and Use	2
FOREST 4330	Practice of Silviculture	3
FOREST 4370	Wildland Fire Management	3
FOREST 4360	Photogrammetry, Inventory and Models	3
FOREST 4390	Watershed Management and Water Quality	3
GEOG 3610	Physical Geography of the United States	3
GEOG 3630	Earth Surface Systems	3
GEOG 4710	Spatial Analysis in Geography	3
GEOG 3830	Remote Sensing	3
GEOG 3040	Introduction to Geographic Information Systems GIS	3
GEOG 4940	Advanced Geographic Information Systems (GIS II)	3
NAT_R 4325	Introduction to Geographic Information Systems	3
PLNT_S 3270	Forage Crops	3
PLNT_S 3275	Grain Crops	3
RU_SOC 4341	Building Communities from the Grassroots	3
RU_SOC 4370	Environmental Sociology	3
SOIL 4308	Soil Conservation	3
SOIL 4313	Soil Fertility and Plant Nutrition	3
SOIL 4320	Genesis of Soil Landscapes	4

**Water Quality Track** 24-25

F_W 3400	Water Quality and Natural Resource Management	3
ENV_SC 4940	Environmental Science Internship	1-99

Select 6 classes (18 credit hours) from the following list (must take at least one course from ENV\_SC or SOIL and a course from another department)

AG_S_M 4420	Surface Water Management	3
ATM_SC 3600	Climates of the World	3
ATM_SC 4400	Micrometeorology	3
BIOL_EN 4150	Soil and Water Conservation Engineering	3
CV_ENG 4200	Remote Sensing of the Environment	3
ENV_SC 3330	Environmental Land Use Management	3
ENV_SC 4305	Environmental Soil Physics	3
ENV_SC 4306	Environmental Soil Physics Laboratory	2
ENV_SC 4312	Environmental Soil Microbiology	3
ENV_SC 4318	Environmental Soil Chemistry	3
F_W 4100	Limnology	3-4
F_W 4800	Environmental Toxicology	3
FOREST 4360	Photogrammetry, Inventory and Models	3
FOREST 4390	Watershed Management and Water Quality	3
GEOG 3830	Remote Sensing	3
GEOG 3040	Introduction to Geographic Information Systems GIS	3
GEOG 4940	Advanced Geographic Information Systems (GIS II)	3
GEOL 4100	Groundwater Hydrology	3
GEOL 4300	Introduction to Low-Temperature Geochemistry	3
NAT_R 4325	Introduction to Geographic Information Systems	3
PLNT_S 4720	Aquatic Entomology	3
RU_SOC 4370	Environmental Sociology	3

SOIL 4308	Soil Conservation	3
SOIL 4313	Soil Fertility and Plant Nutrition	3
SOIL 4320	Genesis of Soil Landscapes	4

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
GEOL 1100	4	CHEM 1320	4		
HIST 1100 or POL_SC 1100	3	ENGLSH 1000	3		
MATH 1100	3	ENV_SC 1100	3		
AFNR 1120	2	SOIL 2100	3		
AFNR 2120	1	SOIL 2106	2		
		Humanities Elective	3		
	13		18		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
ATM_SC 1050	3	AG_EC 2070	3	International Studies recommended	6-9
BIO_SC 1500	5	CHEM 1330	4		
RU_SOC 1000	3	COMMUN 1200	3		
MATH 1400	3	ENV_SC 3500	3		
ENV_SC 3290	3	RU_SOC 2225	3		
	17		16		6-9
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
BIO_SC 1200	5	F_W 3400	3	ENV_SC 4940	3
BIO_SC 3650	5	NAT_R 4325	3		
STAT 2530	3	NAT_R 4353	3		
Humanities Elective	3	ENV_SC 3330	3		
		Humanities Elective	3		
	16		15		3
Fourth Year					
Fall	Credits	Spring	Credits		
ENV_SC 4305	3	GEOL 4100	3		
ENV_SC 4306	2	F_W 4800	3		
ENV_SC 4320	3	ENV_SC 4318	3		
F_W 4100	4	Other Electives	7		
FOREST 4390	3				

Other Elective	2		
	17		16
Total Credits: 137-140			

## BS in Soil, Environmental and Atmospheric Sciences with Emphasis in Environmental Soil Science

### Major Program Requirements

In addition to university general education (<https://nextcatalog.missouri.edu/academicdegreerequirements/generaleducationrequirements>) requirements, students must meet school requirements as well as the degree requirements below:

### Emphasis in Environmental Science

Addressing environmental problems such as water and air quality, waste management and land use issues often requires an interdisciplinary science education as well as an understanding of the social and economic context of the problem. The environmental science emphasis is designed to prepare students for careers as environmental professionals.

Within the environmental science emphasis, students can choose one of three tracks:

- water quality
- land management
- air quality

Students in all tracks take a mixture of natural and applied science courses such as ecology, soil science, forestry, atmospheric science, and fisheries and wildlife.

Other required classes provide students with technical and outreach skills such as geographical information systems (GIS) and additional communications courses, to prepare for work in environmental careers. Students also gain hands-on experience in their field of interest through off-campus internships and practical courses. Each of the tracks requires a 3-credit practical internship in environmental science. Students must complete 128 credits to graduate, including 21-22 credits in the water quality, land management or air quality track.

Among the skills and abilities students develop as graduates with an environmental science emphasis are:

- Understanding of ecosystems and the factors affecting environmental processes and problems
- Facility with environmental monitoring techniques and instrumentation
- Knowledge of technologies and methods for remediation of degraded environments
- Capacity to effectively communicate and educate others about the environment

### Emphasis core general requirements

#### Social and behavioral sciences

AG_EC 1041	Applied Microeconomics	3
or AG_EC 2070	Environmental Economics and Policy	
RU_SOC 1000	Rural Sociology	3
or RU_SOC 1120	Population and the Environment	

RU\_SOC 2010 Leadership in Today's World 3  
 or RU\_SOC 2225 Science, Technology and Society

**Math reasoning skills**

MATH 1400 Calculus for Social and Life Sciences I 3-5  
 or MATH 1500 Analytic Geometry and Calculus I

**Computer science**

AFNR 1120 Computing and Information Technology 2  
 AFNR 2120 Working with Data Using Excel 1

**Communications**

AG\_ED 2220 Verbal Communication in Agriculture, Food and Natural Resources 3  
 or COMMUN 1200 Public Speaking

**Senior capstone experience**

ENV\_SC 4320 Hydrologic and Water Quality Modeling 3

**Emphasis core quantitative skills requirements**

STAT 2530 Statistical Methods in Natural Resources 3

**Emphasis core science requirements (organic chemistry is recommended)**

**Chemistry**

CHEM 1320 College Chemistry I 4  
 CHEM 1330 College Chemistry II 4  
 Optional  
 CHEM 2030 Survey of Organic Chemistry 3  
 CHEM 2100 Organic Chemistry I 8  
 & CHEM 2110 and Organic Chemistry II  
 & CHEM 2140 and Organic Laboratory II

**Biological science**

BIO\_SC 1200 General Botany with Laboratory 5  
 BIO\_SC 1500 Introduction to Biological Systems with Laboratory 5  
 BIO\_SC 3650 General Ecology 5  
 or FOREST 4320 Forest Ecology

**Geology**

GEOL 1100 Principles of Geology with Laboratory 4  
 or GEOL 1200 Environmental Geology with Laboratory

**Physics**

ENV\_SC 4305 Environmental Soil Physics 4-5  
 & ENV\_SC 4306 and Environmental Soil Physics Laboratory  
 or PHYSICS 1210 College Physics I  
 or PHYSICS 2750 University Physics I

**Policy/Regulation**

NAT\_R 4353 Natural Resource Policy/Administration 3  
 or CV\_ENG 4250 Environmental Regulatory Compliance

**Other emphasis core requirements**

ATM\_SC 1050 Introductory Meteorology 3  
 ENV\_SC 1100 Introduction to Environmental Science 3  
 ENV\_SC 3290 Soils and the Environment 3  
 ENV\_SC 3250 Pollutant Fate and Transport 3  
 SOIL 2100 Introduction to Soils 3  
 SOIL 2106 Soil Science Laboratory 2

**Water quality track**

F\_W 3400 Water Quality and Natural Resource Management 3

ENV\_SC 4940 Environmental Science Internship 3

Select six classes from the following list (must take at least one course from Environmental Science or Soil Science and a course from another department): 18

AG\_S\_M 4420 Surface Water Management

ATM\_SC 3600 Climates of the World

ATM\_SC 4400 Micrometeorology

ATM\_SC 4510 Remote Sensing for Meteorology and Natural Resources

BIOL\_EN 4150 Soil and Water Conservation Engineering

CV\_ENG 3702 Hydrology

CV\_ENG 4200 Remote Sensing of the Environment

ENV\_SC 3330 Environmental Land Use Management

ENV\_SC 4305 Environmental Soil Physics

ENV\_SC 4306 Environmental Soil Physics Laboratory

ENV\_SC 4312 Environmental Soil Microbiology

ENV\_SC 4318 Environmental Soil Chemistry

F\_W 4100 Limnology

F\_W 4800 Environmental Toxicology

FOREST 4360 Photogrammetry, Inventory and Models

FOREST 4390 Watershed Management and Water Quality

GEOG 3040 Introduction to Geographic Information Systems GIS

GEOG 3830 Remote Sensing

GEOG 4630 River and Stream Dynamics

GEOG 4940 Advanced Geographic Information Systems (GIS II)

GEOL 4100 Groundwater Hydrology

GEOL 4110 Karst Hydrology

GEOL 4300 Introduction to Low-Temperature Geochemistry

NAT\_R 4325 Introduction to Geographic Information Systems

PLNT\_S 4720 Aquatic Entomology

RU\_SOC 4370 Environmental Sociology

SOIL 4308 Soil Conservation

SOIL 4313 Soil Fertility and Plant Nutrition

SOIL 4320 Genesis of Soil Landscapes

**Land management track**

ENV\_SC 3330 Environmental Land Use Management

ENV\_SC 4940 Environmental Science Internship

Select six classes from the following list (must take at least one course from Environmental Science or Soil Science and a course from another department): 18

AG\_S\_M 4360 Precision Agriculture Science and Technology

AG\_S\_M 4420 Surface Water Management

ATM\_SC 3600 Climates of the World

ATM\_SC 4400 Micrometeorology

BIOL\_EN 4150 Soil and Water Conservation Engineering

CV\_ENG 4200 Remote Sensing of the Environment

ENV\_SC 4305 Environmental Soil Physics

ENV_SC 4306	Environmental Soil Physics Laboratory
ENV_SC 4312	Environmental Soil Microbiology
ENV_SC 4318	Environmental Soil Chemistry
F_W 4800	Environmental Toxicology
FOREST 3207	Forest Fire Control and Use
FOREST 4330	Practice of Silviculture
FOREST 4360	Photogrammetry, Inventory and Models
FOREST 4370	Wildland Fire Management
FOREST 4390	Watershed Management and Water Quality
GEOG 3610	Physical Geography of the United States
GEOG 3040	Introduction to Geographic Information Systems GIS
GEOG 3630	Earth Surface Systems
GEOG 3830	Remote Sensing
GEOG 4710	Spatial Analysis in Geography
GEOG 4940	Advanced Geographic Information Systems (GIS II)
NAT_R 4325	Introduction to Geographic Information Systems
PLNT_S 3270	Forage Crops
PLNT_S 3275	Grain Crops
RU_SOC 4341	Building Communities from the Grassroots
RU_SOC 4370	Environmental Sociology
SOIL 4308	Soil Conservation
SOIL 4313	Soil Fertility and Plant Nutrition
SOIL 4320	Genesis of Soil Landscapes
<b>Hydrology track</b>	
FOREST 4390	Watershed Management and Water Quality 3
NAT_R 3290	Hydrologic Measurement Techniques 1
ENV_SC 4940	Environmental Science Internship 3
Recommended to take	
PHYSICS 1220	College Physics II 4
or PHYSICS 2760 University Physics II	
Select 6 classes (18 credit hours) from the following list (must take at least one course from Environmental Science or Soil Science and a course from another department)	
AG_S_M 4420	Surface Water Management
ATM_SC 4400	Micrometeorology
ATM_SC 4520	Environmental Biophysics
ATM_SC 4590	Radar Meteorology
BIOL_EN 4150	Soil and Water Conservation Engineering
CV_ENG 3200	Fundamentals of Environmental Engineering
CV_ENG 3700	Fluid Mechanics
CV_ENG 3702	Hydrology
ENV_SC 4305	Environmental Soil Physics
ENV_SC 4306	Environmental Soil Physics Laboratory
ENV_SC 4318	Environmental Soil Chemistry
F_W 3400	Water Quality and Natural Resource Management
GEOG 3630	Earth Surface Systems
GEOG 4630	River and Stream Dynamics

GEOL 4100	Groundwater Hydrology
SOIL 4308	Soil Conservation
SOIL 4320	Genesis of Soil Landscapes
<b>Electives</b>	<b>12-14</b>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
GEOL 1100	4	CHEM 1320	4		
HIST 1100 or POL_SC 1100	3	ENGLISH 1000	3		
MATH 1100	3	ENV_SC 1100	3		
AFNR 1120	2	SOIL 2100	3		
AFNR 2120	1	SOIL 2106	2		
		Humanities Elective	3		
	<b>13</b>		<b>18</b>		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
ATM_SC 1050	3	AG_EC 2070	3	International Studies recommended	6-9
BIO_SC 1500	5	CHEM 1330	4		
RU_SOC 1000	3	COMMUN 1200	3		
MATH 1400	3	ENV_SC 3500	3		
ENV_SC 3290	3	RU_SOC 2225	3		
	<b>17</b>		<b>16</b>		<b>6-9</b>
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
BIO_SC 1200	5	F_W 3400	3	ENV_SC 4940	3
BIO_SC 3650	5	NAT_R 4325	3		
STAT 2530	3	NAT_R 4353	3		
Humanities Elective	3	ENV_SC 3330	3		
		Humanities Elective	3		
	<b>16</b>		<b>15</b>		<b>3</b>
Fourth Year					
Fall	Credits	Spring	Credits		
ENV_SC 4305	3	GEOL 4100	3		
ENV_SC 4306	2	F_W 4800	3		
ENV_SC 4320	3	ENV_SC 4318	3		

F_W 4100	4	Other Electives	7
FOREST 4390	3		
Other Elective	2		
	17		16
Total Credits: 137-140			

## BS in Soil, Environmental and Atmospheric Sciences with Emphasis in Soil Resource Management

### Major Program Requirements

In addition to university general education (p. 18) requirements, students must meet school requirements, as well as the degree requirements below:

### Emphasis in Soil Resource Management

This course of study prepares the student for employment as a professional soil scientist in government, industry or consulting. Courses offered in soil science emphasize the application of basic physical and biological sciences to understanding the function and use of soils. A major in soil, environmental and atmospheric sciences with an emphasis in soil resource management requires 128 credits for graduation.

Soil science professionals have a wide range of career opportunities, including working in land-use planning and assessment, agricultural and horticultural production, consulting and sales, landscaping and recreational management. Among the state and federal agencies that employ soil scientists are the USDA-Natural Resources Conservation Service, the US Forest Service, the US Environmental Protection Agency, the Missouri Department of Natural Resources, the Missouri Department of Conservation and the Missouri Department of Health and Senior Services. Opportunities in private industry include working in environmental consulting firms and the horticultural and agricultural production and service industries.

#### Emphasis core general requirements

##### Math reasoning skills

MATH 1400	Calculus for Social and Life Sciences I	3
or MATH 1500	Analytic Geometry and Calculus I	

##### Computer Science

AFNR 1120	Computing and Information Technology	2
AFNR 2120	Working with Data Using Excel	1
or NAT_R 4325	Introduction to Geographic Information Systems	

##### Senior capstone experience

SOIL 4320	Genesis of Soil Landscapes	4
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##### Emphasis core quantitative skills

STAT 1400	Elementary Statistics for Life Sciences	3
or STAT 2530	Statistical Methods in Natural Resources	

Additional courses (6 credits) in math, computer science, and statistics OR two of the following:

ENV\_SC 4320 Hydrologic and Water Quality Modeling

NAT\_R 4325 Introduction to Geographic Information Systems

NAT\_R 4365 GIS Applications

NAT\_R 4385 Landscape Ecology and GIS Analysis I

**Emphasis core science requirements (including one course in organic or biochemistry)** 7

**General chemistry** 4

CHEM 1320 College Chemistry I 4

**Organic chemistry OR Biochemistry** 3

Select one of the following:

CHEM 2100 Organic Chemistry I

or CHEM 2030 Survey of Organic Chemistry

BIOCHM 2110 The Living World: Molecular Scale

or BIOCHM 2112 Biotechnology in Society

**Biological science** 6-8

Select two of the following: 6-8

ENV\_SC 1100 Introduction to Environmental Science

or NAT\_R 1070 Ecology and Renewable Resource Management

PLNT\_S 2110 Plant Growth and Culture

or BIO\_SC 1010 General Principles and Concepts of Biology and General Biology Laboratory

& BIO\_SC 1020

BIO\_SC 1200 General Botany with Laboratory

**Geology (any course)** 4

**Recommended science electives** 9

Courses in biochemistry, biology, chemistry, entomology, geology, physics, and plant pathology as well as the following:

CHEM 1330 College Chemistry II

CV\_ENG 3702 Hydrology

FOREST 4320 Forest Ecology

PLNT\_S 3210 Principles of Weed Science

PLNT\_S 3225 Plant Breeding and Genetics

PLNT\_S 4315 Crop Physiology

**Other emphasis core requirements** 36

ATM\_SC 1050 Introductory Meteorology

SOIL 2100 Introduction to Soils

SOIL 2106 Soil Science Laboratory

SOIL 3290 Soils and the Environment

**Additional soils courses (12 credits) from the following:**

SOIL 4305 Environmental Soil Physics

SOIL 4306 Environmental Soil Physics Laboratory

SOIL 4308 Soil Conservation

SOIL 4312 Environmental Soil Microbiology

SOIL 4313 Soil Fertility and Plant Nutrition

SOIL 4314 Soil Fertility and Plant Nutrition Laboratory

SOIL 4318 Environmental Soil Chemistry

SOIL 4360 Precision Agriculture Science and Technology

**Recommended electives, other soils courses or the following courses (6 credits)**



BIOL_EN 4150	Soil and Water Conservation Engineering
BIOL_EN 4250	Irrigation and Drainage Engineering
CV_ENG 3400	Fundamentals of Geotechnical Engineering
ENV_SC 4320	Hydrologic and Water Quality Modeling
F_W 3400	Water Quality and Natural Resource Management
FOREST 4390	Watershed Management and Water Quality

**Credits from general, quantitative, science and soil science to 25-29 complete 128 total.**

Total Credits 123-131

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
AFNR 1120	2	CHEM 1320	4		
AFNR 2120	1	ENGLISH 1000	3		
HIST 1100 or POL_SC 1100	3	ENV_SC 1100	3		
GEOL 1100	4	SOIL 2100	3		
MATH 1100	3	SOIL 2106	2		
Elective	2-3	Social Science Elective	3		
	<b>15-16</b>		<b>18</b>		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
ATM_SC 1050	3	BIOCHM 2110	3	International Studies recommended	6-9
CHEM 2100	3	PLNT_S 2110	3		
AG_EC 1041	3	COMMUN 1200	3		
MATH 1400	3	STAT 1400	3		
ENV_SC 3290	3	Humanities Elective	3		
	<b>15</b>		<b>15</b>		<b>6-9</b>
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
NAT_R 3110	3	SOIL 4312	3	Internship recommended	3
SOIL 4320	4	Science Elective	6		
Humanities Elective	3	Humanities Elective	3		
Departmental Elective	6				
	<b>16</b>		<b>12</b>		<b>3</b>

Fourth Year				
Fall	Credits	Spring	Credits	
Departmental Elective	3	SOIL 4313	3	
Science Elective	3	Departmental Elective	3	
Other Elective	10	Other Elective	10	
	<b>16</b>		<b>16</b>	
Total Credits: 132-136				

## Minor in Soil, Environmental and Atmospheric Sciences

A minor in soil, environmental and atmospheric sciences is offered at the undergraduate level with three options: atmospheric science, environmental science, and soil science.

The minor in soil, environmental, and atmospheric sciences with an option in atmospheric science prepares the student for jobs in journalism and broadcast meteorology as well as for certification required by government agencies. A minor with an option in atmospheric science requires a minimum of 15 credits including:

ATM_SC 1050	Introductory Meteorology	3
ATM_SC 2720	Weather Briefing	1
ATM_SC 3600	Climates of the World	3
Additional 8 credits in atmospheric science or in a closely related area as recommended by the minor advisor, and may include the following		8
ATM_SC 2150	Natural Hazards	
ATM_SC 2792	Weather Communication	
ATM_SC 4520	Environmental Biophysics	
Total Credits		15

The minor in soil, environmental and atmospheric sciences with an option in environmental science requires a minimum of 15 credit hours in environmental science courses with at least 9 credit hours at the 3000 level or above. This minor provides students an opportunity to enhance their understanding of the environment, interrelationships between various components of the environment, and a firm understanding of environmental issues. Selection of courses should be made in consultation with an advisor in environmental science. The following courses are required:

ENV_SC 1100	Introduction to Environmental Science	3
ENV_SC 3290	Soils and the Environment	3
ENV_SC 3330	Environmental Land Use Management	3
F_W 3400	Water Quality and Natural Resource Management	3
Additional credits in environmental science as recommended by the advisor		3
Total Credits		15

The minor in soil, environmental and atmospheric sciences with an option in soil science requires a minimum of 15 credits in soil science. Selection of courses should be made in consultation with an advisor in soil science. Students with the following majors often choose minors with an option in soil science: forestry, fisheries and wildlife, plant science, and geological

sciences. This minor also provides assistance with meeting certification as a waste water specialist. The following courses are required:

SOIL 2100	Introduction to Soils	3
SOIL 2106	Soil Science Laboratory	2
SOIL 4320	Genesis of Soil Landscapes	4
Additional credits at the 3000 level or higher in soil science as recommended by the minor advisor		6
<hr/> Total Credits		15

## Additional Minors and Certificates - CAFNR

### Undergraduate

- Minor in Agricultural Leadership (p. 123)
- Minor in Captive Wild Animal Management (p. 123)
- Minor in International Agriculture (p. 123)
- Minor in Sustainable Agriculture (p. 124)
- Minor in Youth Services (p. 124)

### Graduate

- Certificate in Analysis of Institutions and Organizations (p. 124)
- Certificate in Food Safety and Defense (p. 125)

## Undergraduate

### Minor in Agricultural Leadership

The minor in Agricultural Leadership is for students interested in enhancing their public speaking, analytical reasoning, critical thinking, effective writing and teamwork skills. A student must complete 15 credits of coursework related to leadership and personal development from the list of approved courses. The coordinator of the minor must approve courses not on the list. With appropriate approval, an internship with a focus upon providing the student practical experiences in leadership and supervisory roles can be counted toward the 15 credit requirement.

#### Approved Courses

AG_ED 2250	Introduction to Leadership	3
AG_ED 2220	Verbal Communication in Agriculture, Food and Natural Resources	3
AG_ED 2260	Team and Organizational Leadership	3
AG_EC 2223	Agricultural Sales	3
AG_EC 3241	Ethical Issues in Agriculture	3
AG_EC 3283	Fundamentals of Entrepreneurship	3
P_R_TR 3210	Personnel Management and Leadership in Leisure Services	3
RU_SOC 2010	Leadership in Today's World	3

### Minor in Captive Wild Animal Management

Students majoring in Animal Science can obtain a minor in captive wild animal management by taking courses in Animal Science, Natural Resources, and Fisheries and Wildlife that focus on captive wild animals.

#### Core Courses

AN_SCI 1012	Introduction to Captive Wild Animal Management	3
F_W 3600	Introduction to Conservation Biology	3
AN_SCI 3212	Principles of Animal Nutrition	3
AN_SCI 3232	Animal Feeds and Feeding	3
AN_SCI 3254	Physiology of Domestic Animals	3
AN_SCI 3255	Physiology of Domestic Animals Laboratory	2
AN_SCI 4940	Internship in Animal Science & Technology	1-12

AN_SCI 4910	Senior Seminar in Captive Wild Animal Management	1
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#### Ecology Courses (choose one)

BIO_SC 3400	Evolution and Ecology
BIO_SC 3650	General Ecology

#### Genetics Course (choose one)

AN_SCI 3213	Genetics of Agricultural Plants and Animals
F_W 2500	Introduction to Genetics and Evolution for Conservation

#### Wild Animal Ecology & Natural History Courses (select two)

F_W 2600	Ornithology
F_W 2700	Ichthyology
F_W 3200	Aquaculture
F_W 3660	Mammalogy
BIO_SC 3360	Herpetology
F_W 3700	Animal Behavior
BIO_SC 3710	Introductory Entomology
BIO_SC 4640	Behavioral Biology
PSYCH 4220	Animal Learning and Behavior

#### Advanced Physiology, Nutrition & Disease Courses (Choose two)

AN_SCI 4312	Monogastric Nutrition
AN_SCI 4314	Physiology of Reproduction
AN_SCI 4332	Ruminant Nutrition
AN_SCI 4384	Reproductive Management
AN_SCI 4437	Environmental Physiology
F_W 4810	Wildlife Disease Ecology
AN 323 Zoo Nutrition (Must be taken through Colorado State University)	

### Minor in International Agriculture

The world is becoming increasingly complex and integrated in nearly every category of human endeavor. An understanding of how global markets, natural resources, food production, and international trade and cooperation are affected by societies, languages, cultures, and governments is an essential component of a well-rounded 21<sup>st</sup> century education in AFNR. To facilitate these studies, the multidisciplinary International AFNR Minor offers academic recognition for achieving a level of expertise in coursework of international focus.

A student who wishes to pursue an International AFNR Minor should visit with the advisor for this minor, Dr. Laura McCann, early in the college career.

#### Coursework

- Fifteen total credit hours are required
- At least 9 hours must be approved CAFNR courses at the 3000 level or higher

Although the focus of this minor is not to add foreign language skills, students are strongly encouraged to invest in language to make themselves more competent in the international arena, to gain a competitive advantage for employment, and to advance their careers overall.

**Choose at least 9 hours from the following:**

AG_EC 3150	International Agribusiness	3
AG_EC 3230	Agricultural and Rural Economic Policy	3
AG_EC 3271	International Agricultural Development	3
AG_EC 3272	International Food Trade and Policy	3
ATM_SC 3600	Climates of the World	3
ENV_SC 3290	Soils and the Environment	3
F_W 3090	International Studies in Conservation	1-5
F_S 3190	Study Abroad: International Meat, Dairy and Enology	3
FOREST 4385	Agroforestry I: Theory, Practice and Adoption	3
HSP_MGMT 4343	International Hotel Management	3
RU_SOC 3235	Global Perspectives and Realities	3
RU_SOC 4310	Sociology of Agriculture and Natural Resources	3
RU_SOC 4335	Social Change and Development	3
SOIL 3290	Soils and the Environment	3
SOIL 4320	Genesis of Soil Landscapes	4

**Suggestions on remaining 6 hours:**

AFNR 2150	Agricultural Travel Course	1-99
AFNR 2190	International Agriculture and Natural Resources	1-15
AFNR 2191	International Agriculture and Natural Resources - Humanities	1-6
AFNR 2192	International Agriculture/Natural Resources-Social Science	1-6
AG_EC 1011	Survey of Global Agribusiness	1
AN_SCI 2110	Global Animal Agriculture	2
F_S 2195	Grapes and Wines of the World	3
P_R_TR 2082	Domestic and International Sports Environment	1
RU_SOC 1120	Population and the Environment	3

\* Students can also meet requirements using other MU courses of international focus, including foreign language, if approved by the student's academic advisor and the International AFNR Minor advisor. Independent research with a faculty member can also be used if approved by the student's academic advisor and the International AFNR Minor advisor.

## Minor in Sustainable Agriculture

The minor in sustainable agriculture is for students interested in exploring agriculture and food systems that promote profit-ability, steward our natural resources, and provide enhanced quality of life for farmers, citizens and communities. A student must complete 15 credits of coursework that introduces concepts of sustainable agriculture, provides practical information on natural resources and food production, and investigates the impact of different philosophical and scientific frameworks on food and agriculture.

Required coursework includes:

AFNR 2215	Introduction to the Theory and Practice of Sustainable Agriculture	3
AFNR 3215	Community Food Systems	3
SOIL 2100	Introduction to Soils	3
AG_EC 3241	Ethical Issues in Agriculture	3

or BIOCHM 2112 Biotechnology in Society

Select one of the following:	3	
PLNT_S 1125	People, Plants and the Environment	
PLNT_S 2110	Plant Growth and Culture	
PLNT_S 2075	Environmental Horticulture	
AN_SCI 2165	Introduction to Ruminant Livestock Production	
AN_SCI 2175	Introduction to Monogastric Production	
Total Credits		15

## Minor in Youth Services

Every person has gone or will go through a period when they are establishing their identity and moving from childhood to-ward being an adult. This minor includes courses from a variety of fields including Human Development, Social Work, Rural Sociology, and Parks, Recreation and Tourism. The goal of the minor is to help individuals prepare for a career related to youth service work such as with 4-H, Boy and Girl Scouts, Big Brothers, Big Sisters, and many other youth service agencies.

## Graduate

### Graduate Certificate in Analysis of Institutions and Organizations

The Certificate Program focuses on the structures and processes of Institutions and Organizations in changing environments. Institutions are the "rules of the game" that shape human interaction and consist of both formal rules (e.g. legal-contractual) and informal structures (norms, values and beliefs). Organizations are the concrete, humanly devised entities in which people interact and pursue goals, ranging from families to private and nonprofit firms and public agencies. This certificate emphasizes the common foundations of institutional analysis across academic disciplines including economics, sociology, political science, psychology, anthropology, geography, and law, as well as the ways that multidisciplinary perspectives can inform each other.

Certificate web site: <http://dass.missouri.edu/agecon/grad/dass-certificate-in-institutions-and-organizations.pdf>

For information, contact:

Dr. David O'Brien  
Certificate Director, Rural Sociology  
obriendj@missouri.edu

Dr. Jere Gille  
Director of Graduate Studies, Rural Sociology

Dr. Harvey James  
Director of Graduate Studies, Agricultural and Applied Economics

Phone: 573-882-7451

Address: 109 Gentry Hall, Columbia, MO 65211

## **Graduate Certificate in Food Safety and Defense**

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In an era of global food systems and heightened, effective control of foodborne hazards requires strategic knowledge. There is an urgent need for food industry personnel who, while working fulltime, would like to pursue more in-depth specialized training in food safety and security that is pertinent to their job. This certificate will help serve the needs of industry and agencies that must protect the human food supply from accidental or deliberate contamination with pathogenic microbes and/or toxicants.

## College of Arts and Science

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### Administration

Michael J. O'Brien, Dean  
Theodore A. Tarkow, Associate Dean

Arts and Science Dean's Office  
317 Lowry Hall  
(573) 882-4421

### Contact Information

Arts and Science Advising Support Services  
107 Lowry Hall  
(573) 882-6411  
umcasadvising@missouri.edu

The College of Arts and Science, established in 1841, is the oldest and largest academic division in the university. The majority of MU undergraduates are enrolled in the college, which provides undergraduate and graduate programs in humanities, fine and performing arts, and social, behavioral and natural sciences. It also offers a solid foundation in basic studies for students in professional and specialized programs in other colleges. In addition to offering degrees in a wide range of academic disciplines, the College also allows creative and useful combinations of disciplines in both the Interdisciplinary Studies and General Studies baccalaureate degrees.

A liberal education is the foundation of study in many disciplines. It enables students to serve roles in society or to continue their education with advanced academic study. To these ends, the college encourages excellence in teaching and scholarship among its faculty and provides both traditional and innovative undergraduate curricula. Degree programs allow flexibility in individual courses of study.

Many students who enroll in the college during their first two years at the University have not yet decided upon a major field of study. The structure of the college is such that students generally need not commit themselves to a major until the beginning of the junior year. This allows students time to explore possibilities and to consider their likes and dislikes and their personal and professional objectives. Students are encouraged to work closely with academic advisors while deciding on a program of study.

Students planning to enter the schools of Journalism, Law, Medicine or Veterinary Medicine often spend their first two or four years in the College of Arts and Science in preparation for professional training. Most students, realizing the increased necessity for a broad background in the liberal arts for all professions, earn an undergraduate degree in the college before enrolling in the schools of Law or Medicine. Preprofessional study for veterinary medicine may be completed either in the College of Agriculture, Food and Natural Resources or in the College of Arts and Science.

### Undergraduate

- College of Arts and Science Requirements
- Credit Restrictions
- Departmental Examinations
- Maximum Credits Enrolled
- Enrolling at Other Institutions

- Graduation with Latin Honors
- Probation and Dismissal
- Degree Requirements
- Major Program Requirements
- Requirements for Optional Minor
- Dual Degrees
- Second Degrees
- Double Majors
- Graduate School Dual Enrollment
- Advising
- Career Placement
- Air Force Reserve Officer Training Corps (AFROTC)
- Army Reserve Officer Training Corps (AROTC)

### College of Arts and Science Requirements

To earn any degree from the College of Arts and Science, in addition to the university requirements a candidate must fulfill each of the following:

- Complete all course work required for the Arts and Science Foundation Requirements.
- Basic Skills, Breadth of Study and Depth of Study requirements
- Sufficient elective credits to bring the total earned credits to 120
- Earn a GPA of 2.0 in the following categories:
  - A minimum 2.0 cumulative MU GPA
  - A minimum 2.0 MU GPA in all courses taken in the major
  - A minimum 2.0 MU GPA in all courses taken in the final 60 credits
  - A minimum 2.0 MU GPA in all courses taken in the final 30 credits
  - A minimum 2.0 MU GPA in all courses taken in the minor, if student is completing one
- Attain grades of C- or higher in the major and optional minor. Some departments of the college have higher minimum grade requirements in specified courses.
- Earn a minimum of 30 credits in courses numbered 3000 or above, which may include courses in the major. These courses must be regularly accepted for credit in the College of Arts and Science. A few specifically identified math, science, and music courses numbered at the 2000-level may be used to meet this requirement. Additional information is available in appropriate advising offices.

### Credit Restrictions

#### Time Limit on Credits Earned

Credit that is applied toward a degree is considered valid for eight years. After that time, the validity of credit already on the transcript will be reevaluated. Departments of the college have the right to accept or to reject credit earned after eight years have passed.

#### Credit Toward Degree

Some courses are not accepted toward a degree in the College of Arts and Science. They are:

- MIL\_SC 1100, MIL\_SC 1130, MIL\_SC 2210 and MIL\_SC 2230
- Vocational courses, such as radio repair or keyboarding

- Developmental courses, such as MATH\_0110, English Language Support Program courses, spelling and grammar

## Sequence

Credit for a more advanced course within a sequence will not apply toward graduation if a student subsequently completes a less advanced course. (For example: completion of FRENCH 1200 after FRENCH 2100 or completion of MATH 1100 after MATH 1300.)

## Maximum Credit Policies

- With the exception of MATH 1100, MATH 1120 (or equivalent), ENGLSH 1000 (or equivalent), and the elementary sequence in a foreign language, the maximum number of credits from a single department that may apply toward graduation is 40 for the BA and the BGS, 70 for the BFA, and 90 for the BM.
- A maximum of 12 credits for internship, special problems or directed readings may apply toward any one degree. Of the 12 hours, only 6 may be earned as internship credit. Some departments may further restrict this type of credit for both majors and non-majors in arts and science.
- A maximum of 5 credits for BIO\_SC 2060 (or BIO\_SC 3100) and BIO\_SC 3650 may apply toward graduation.
- A maximum of 5 credits for MATH 1100, MATH 1120, MATH 1140, MATH 1160 and MATH 1180 may apply toward graduation.
- A maximum of 5 credits for MATH 1320, MATH 1400 and MATH 1500 may apply toward graduation.
- A maximum of 10 credits for introductory chemistry, which includes CHEM 1310 (or CHEM 1100), CHEM 1320, CHEM 1330 and CHEM 1500H, may apply toward graduation.
- A maximum of 1 credit for AG\_EC 3285 may apply toward graduation.
- A maximum of 3 credits for any combination of the following may apply toward graduation: LTC\_V 1210; LTC\_V 4550; CMP\_SC 1020.
- For non-music majors, a maximum of 6 credits for music ensemble courses, which include MUS\_ENS 1841, MUS\_ENS 1842, MUS\_ENS 1846, MUS\_ENS 1865 and MUS\_ENS 2843, may apply toward graduation.
- For non-music majors, a maximum of 12 credits for applied music courses, which include MUS\_APMS 1435, MUSIC\_NM 1445, MUSIC\_NM 2445, MUSIC\_NM 2445, MUS\_APMS 3455, MUS\_APMS 3970, MUSIC\_NM 4445 and MUSIC\_NM 4445, may apply toward graduation.
- For non-art majors, a maximum of 12 credits for studio art courses may apply toward graduation. For interdisciplinary studies majors, the maximum is 18 credits, and for general studies majors, the maximum is 21 credits.
- A maximum of 2 credits for physical education activity courses may apply toward graduation.
- A maximum of 5 credits for orientation courses may apply towards graduation. Of these 5 credits, no more than 3 credits may come from courses that cover life skills or orientation to college life, and no more than 3 credits may come from discipline-focused courses. Life skills/college life courses include courses such as Learning Strategies and Orientation to College; discipline-focused orientation courses include courses such as Introduction to Management and Introduction to Physical Therapy. Additional information is available in the appropriate advising offices.

## Departmental Examinations

A student who wishes to take a departmental examination must take it before enrolling in a college class in the same subject. Applications normally are made to the departments indicated; however, during the summer preregistration period, some examinations can be taken at the MU Testing Service Office without formal application to the respective departments. In addition, the examinations administered by Testing Services may be taken any time during the academic year.

Students may not earn credit for introductory foreign language courses in their native language.

- **Chemistry:** Apply to the Department of Chemistry, 125 Chemistry Building, for an examination to earn credits in chemistry.
- **French:** Apply to the Department of Romance Languages, 143 Arts and Science Building, for an examination for 3 credits equivalent to the completion of FRENCH 2100. Upon successful completion of this test, a student will be awarded 10 credits of advanced standing for FRENCH 1100 and FRENCH 1200 in addition to the 3 credits indicated.
- **German:** Apply to the Department of German and Russian Studies, 448 Strickland Hall, for an examination to earn 3 credits in each of the following courses: GERMAN 2100; GERMAN 2260: Intermediate German II: Language and Culture; GERMAN 3230: Introduction to German Literature. Upon successful completion of one of these tests, a student will be awarded 10 credits of advanced standing for GERMAN 1100 and GERMAN 1200 in addition to the 3 credits indicated.
- **Italian:** Apply to the Department of Romance Languages, 143 Arts and Science Building.
- **Latin:** Apply to the Department of Classical Studies, 405 Strickland Hall.
- **Mathematics:** To earn 3 credits in College Algebra, students may take the proctored ALEKS Exam through the Office of Testing Services. (mathplacement.missouri.edu)
- **Political Science:** Contact the group testing program in the Testing Services Office for information on the 3-credit group test.
- **Russian:** Apply to the Department of German and Russian Studies, 448 Strickland Hall, for an examination to earn 3 credits in Elementary Russian and Russian Composition and Conversation. Upon successful completion of one of these two tests, a student will be awarded 10 credits of advanced standing for RUSS 1100 and RUSS 1200 in addition to the 3 credits indicated.
- **Spanish:** Apply to the Department of Romance Languages, 143 Arts and Science Building, for an examination to earn 3 credits equivalent to the completion of SPAN 2100. Upon successful completion of this test, a student will be awarded 10 credits of advanced standing for SPAN 1100 and SPAN 1200 in addition to the 3 credits indicated.
- **Statistics:** Apply to the Department of Statistics, 146 Middlebush Hall, for an examination to earn 3 credits for STAT 1300 Elementary Statistics.

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## Maximum Credits Enrolled

With the consent of the dean, students with superior scholastic records may be allowed to register for more than 18 credits during a fall or spring semester. During the summer sessions, a student may not ordinarily

be enrolled for more than 9 credits during the two four-week sessions combined and/or the eight-week session.

## Enrolling at Other Institutions

Students within the College of Arts & science are allowed to enroll in another institution, while being simultaneously enrolled at MU. Students are strongly encouraged to speak with an advisor to verify course transfer credit, degree applicability and other academic ramifications. Students, however, bear the ultimate responsibility for checking course equivalencies and requesting official transcripts be sent to the MU Office of Admissions (230 Jesse Hall). Similarly, A&S students who are likely to qualify for Latin honors are advised not to risk their eligibility for this distinction because of simultaneous enrollment at another institution (see information on Latin honors). Students who receive financial aid are advised to check with a financial aid officer to learn the implications, if any, of simultaneous enrollment in a non-MU course.

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## Graduation with Latin Honors

Regulations of the college regarding the awarding of Latin honors require that 54 of the final 60 credits are completed in MU course work for a letter grade (A-F). Awarding of Latin Honors is based on the cumulative GPA. The local chapter of Phi Beta Kappa requires completion of a minimum of 60 credits of course work on the MU campus, usually during the last two years of study. Exceptions to this latter expectation may be made for students who study abroad in an approved program during their final semesters of study.

## Probation and Dismissal

### Academic (Scholastic) Standing

In addition to University requirements defined in the Academic Standing (p. 660) section of this catalog and in the *Faculty Handbook* (<http://faculty council.missouri.edu/handbook/article-8.html>), academic status of Arts and Science students is determined in accordance with the following faculty guidelines. The word “term” in these regulations applies to semester, summer session or intersession. Course work completed by correspondence or through extension also has a bearing on academic status.

- Students on scholastic probation have two terms, (as long as each term GPA is no lower than 1.0), in which to attain good academic standing (2.0 minimum term and cumulative GPA) or be subject to dismissal. A student will not be eligible for removal from probation if he or she does not complete in residence during these two terms at least 12 graded credits acceptable by the student’s advisor and in accordance with college policy for credit in the College of Arts and Science. To complete a course, the student must earn a grade in the A, B, C or D range.
- In the application of these rules, the dean will determine how an incomplete grade in a course will be considered in determining a student’s academic standing.
- The dean may, in extenuating circumstances, waive any of the foregoing regulations governing eligibility to re-enroll for an individual student.

## Degree Requirements

### Arts and Science Foundation Requirements

The purpose of the Arts and Science Foundation Requirements is to assure that students fulfill the common educational objectives of the College of Arts and Science. Courses satisfying these requirements impart specialized knowledge and help students fulfill the broader objectives of a liberal education. Thus, these courses help students develop the following abilities:

- To communicate clearly and effectively in both writing and speech
- To generate and test hypotheses
- To locate and develop information needed to solve problems
- To think critically and use analytic skills effectively
- To examine their lives critically and objectively
- To enrich their lives through appreciation of present and past cultural achievements

Foundation requirements include three categories:

- **Basic Skills** requirements ensure competency in composition and communication, mathematics and analytic reasoning, awareness of American history and government, and where applicable, foreign language.
- **Breadth of Study** requirements are met by completing course work from a wide array of disciplines to ensure that graduates are broadly educated.
- **Depth of Study** requirements are met by completing advanced course work that allows for fuller understanding of a discipline than can be gained in introductory course work alone.

All students must complete all Arts and Science Foundation Requirements in order to earn a degree, regardless of prior baccalaureate degrees earned. Course work will be evaluated on a course-by-course basis. For students who earn an Associates of Arts degree from a Regionally accredited Missouri institution all Breadth of Education requirements will be considered to be met. Students will be required to complete at least one Depth of Education class with MU course work. In all cases, completion of the basic English and Mathematics requirements will be evaluated on a course-by-course basis.

### Basic Skills

MATH 1100, MATH 1160, MATH 1120 or transferable equivalent with grade of C- or higher

- Required for BA, BFA, BGS, BM and BS degrees.

ENGLSH 1000 or transferable equivalent with grade of C- or higher

- Required for BA, BFA, BGS, BM and BS degrees.

One Math Reasoning Proficiency course with grade of C- or higher

- Required for BA, BFA, BGS, BM and BS degrees.
- May also apply toward other degree program requirements.
- Must be chosen from the list of MRP courses designated each semester in the online Schedule of Courses.

One course in American government or history

- Required for BA, BFA, BGS, BM and BS degrees.
- May also apply as a social science toward the behavioral and social science requirement.
- Should be chosen from the list of MU courses approved to meet Arts and Science Foundation Requirements.



## Foreign language

- Each student is required to attain the degree of proficiency equivalent to the completion of at least 12 hours of college-level work in a single foreign language. All MU foreign language departments require a grade in the C range or higher in level I or a language and level II of a language as prerequisites for level II and III, respectively.
- Alternative for selected BS degrees: 12 credits numbered 2000 or above in an area approved by the major department substituted with the concurrence of the dean's office. Courses used for a minor cannot be used to meet this requirement.
- The foreign language requirements can be waived if a student has completed four units of a single foreign language in high school. If a student chooses to meet the requirement by using high school units, any college credit for that same introductory language will not count towards graduation hours (i.e., a student who has completed 4 units of high school Spanish and has credit for SPAN 1100 will not have the SPAN 1100 count towards graduation hours). If a student wants to have the introductory college credit count towards graduation, the student must complete the language sequence.
- International students whose native language is other than English are exempt from the foreign language requirements but may not receive credit for basic skills courses in their native languages. Others with native competence in one or more foreign language offered by MU may have a foreign language requirement waived by passing an exam given by a faculty member who is fluent in the language. The faculty member need not be a member of the MU faculty, but must be approved by the dean's office. The exam tests the student's ability to read, write, and speak the language at the level broadly described as "intermediate." Results of the examination are forwarded to the dean's office for evaluation. Students in this situation do not receive advanced-standing credit for their foreign language knowledge.

## Breadth of Study

Breadth of Study requirements include course work distributed among the following categories: biological, physical and mathematical sciences; behavioral and social sciences; humanities and fine arts.

### 1. Biological, physical and mathematical sciences

- 9 credits required for BA, BFA, BGS, BM and BS degrees.
- Must include course work from at least two of three areas.
  - Must include at least one biological or physical science laboratory course.

### 2. Behavioral and social sciences

- 9 credits required for BFA, BGS, BM and BS degrees (except the biological sciences).
- Must include course work from both the behavioral and social sciences.
- 14-15 credits required for all BA degrees and the BS degree with a major in Biological Sciences.
- Must include 5-6 credits of behavioral science.
  - Must include 9 credits of social science, including course work from at least two different areas.

### 3. Humanities and fine arts

- 9 credits required for the BFA, BGS, BM and BS degrees (except for the BS degree with a major in Biological Sciences).
- Must include course work from at least two different areas.

12 credits required for the BA degree, and the BS degree with a major in Biological Sciences.

- Must include course work from at least three different areas.

### 4. Additional breadth requirement for the BGS degree

3 credits from course work chosen from any of the following four categories: biological, physical and mathematical sciences; behavioral sciences; social sciences; humanities and fine arts.

## Parameters for meeting Breadth of Study requirements:

- Courses from the major department may not be used for breadth requirements in the BA, BFA and BS.
- Courses from the major department may be used for breadth requirements in the BM.
- Students earning degrees in special degree programs (where the courses in the major represent multiple departments) may use courses from their major departments to meet breadth requirements, but not the specific courses used in the major.
- Courses from outside the major department but required for the major may not be used to meet breadth requirements in the BFA or BA with a major in Art.
- Only one non-Arts and Science course may be used in each of the four categories: biological, physical and mathematical sciences; behavioral sciences; social sciences; humanities and fine arts.
- Courses must be chosen from the Distribution of Content List on the web site of the General Education Program. (<http://generaleducation.missouri.edu>.)
- Courses used to meet breadth requirements may also be used to meet depth requirements (see below).
- Problems, research, readings, and internship courses may not be used for breadth requirements.

## Depth of Study

Depth of Study requirements include at least 6 hours of course work numbered 2000 or above, distributed as follows:

### BFA in Art

- 6 credits required (minimum of 2 courses).
- Must include course work from at least two of the following four breadth categories: biological, physical, mathematical sciences; behavioral sciences; social sciences; humanities and fine arts.

### BGS in General Studies, BS with a major in Biological Science and all BA degrees

- 9 credits required (minimum of 3 courses).
- Must include course work from at least two of the following four breadth categories: biological, physical and mathematical sciences; behavioral sciences; social sciences; humanities and fine arts.

### BS with majors in Chemistry, Geological Science, Mathematics, Physics and Statistics

- 6 credits required (minimum of 2 courses).
- Must include course work from at least two of the following three breadth categories: behavioral sciences; social sciences; humanities and fine arts.

### BS with a major in Economics

- 6 credits required (minimum of 2 courses).

- Must include course work from at least two of the following four breadth categories: biological, physical and mathematical sciences; behavioral sciences, social sciences, humanities and fine arts.

### **BM with a major in Music**

- 6 credits required (minimum of 2 courses).
- Must include course work from at least one of the following three breadth categories: biological, physical and mathematical sciences; behavioral sciences; social sciences.
- 3 credit hours in Music (see below).

### **Parameters for Meeting Depth of Study Requirements**

- All courses must be numbered 2000 or above.
- At least 3 credits must be completed with MU course work.
- A student who elects 1-credit topics courses must complete a minimum of three courses in that breadth category as partial fulfillment of the depth of study requirement.
- Courses from the major department may not be used, except for the BM with a major in Music.
- Students earning degrees in special degree programs (where the courses in the major represent multiple departments) may use courses from their major departments to meet depth requirements, but not the specific courses used in the major.
- Courses from outside the major department, but required for the major, may not be used to meet depth requirements in the BFA or BA with a major in Art, the BA or BS with a major in Biology, or the BA with a major in Chemistry, Geological Science, Mathematics, Physics, or Statistics.
- Non-Arts and Science courses may not be used.
- Courses must be chosen from the Distribution of Content List (<http://generaleducation.missouri.edu/requirements/distribution.php>) on the website of the General Education Program.
- Courses used to meet depth requirements may also be used to meet breadth requirements.
- Problems, research, readings, and internship courses may not be used.

### **Major Program Requirements**

A major consists of at least 21 credits, including at least 15 credits in courses numbered 2000 or above, 12 of which must be taken in MU course work. See detailed departmental information for additional requirements for specific majors.

All Arts and Science majors require an MU Writing Intensive course numbered 3000 or above and an MU capstone course with grades of C- or higher. In addition, some majors require course work outside the major department.

Each student must declare and receive official approval for a major by submitting a graduation plan no later than the semester after completion of 60 credits. The purpose of the graduation plan is to acquaint students with all requirements that must be met prior to graduation and to plan for the timely completion of these requirements. Departments and programs approve the graduation plan only when the student has met the following criteria:

- 2.0 cumulative GPA

- Completion of ENGLISH 1000 and MATH 1100 or MATH 1120 (or their equivalents) with grades of C- or higher
- Completion of any additional departmental requirements

### **Requirements for an Optional Minor**

A minor consists of at least 15 credits, including at least 6 credits numbered 2000 or above, within a department or program that offers a minor; 9 of the required credits must be taken in MU course work. See detailed departmental information for additional requirements for specific minors. Courses outside the major department but required for the major may be used towards a minor. In addition, courses required in the minor may be used to meet Foundation requirements.

The College of Arts and Science awards minors only to undergraduate students who are simultaneous recipients of bachelor's degrees. Students may not earn a major and a minor in the same field.

### **Dual Degrees**

In order to receive two bachelor's degrees, a student must complete a minimum of 132 credits and complete all of the specific requirements for both degrees. Normally, a minimum of one additional semester is required to earn both degrees. Each candidate for a dual degree is assigned advisors as appropriate.

The College of Arts and Science maintains dual-degree programs with the schools of Law, Medicine and Veterinary Medicine. To enroll in these programs, the student must have completed all of the specific course requirements for the bachelor's degree prior to admission to the professional school and also must have completed the junior year in residence in the College of Arts and Science. Under certain circumstances, Arts and Science undergraduates may be assured admission to MU's schools of Law or Medicine.

### **Second Degrees**

The faculty of the college has approved the following guidelines for students wishing to obtain a second undergraduate degree after completion of a bachelor's degree, in addition to any university requirements that may apply:

- Unless both degrees are earned at MU in successive semesters, a student pursuing a second undergraduate degree will ordinarily be required to complete a minimum of 30 credits in residence in the College of Arts and Science after completion of the first undergraduate degree.
- A student must complete any college, general education or department requirements that are unique to the new degree program. Requirements that are in effect at the time a student begins work toward the second degree are applicable.
- Students applying for second-degree status will be considered only if they have completed (with grades C- or higher) ENGLISH 1000 and MATH 1100 or MATH 1120 (or equivalents) and have final term and cumulative GPAs no less than 2.0.
- The student must submit a graduation plan in consultation with an advisor in an appropriate department or program before the dean's office will approve a request from the student to enroll as a candidate for a second degree.

- With the exception of Interdisciplinary Studies majors with an emphasis in Black Studies, Peace Studies, or Women's and Gender Studies, the college does not approve applications for a second undergraduate degree in General Studies or Interdisciplinary Studies.
- Once enrolled for a second degree, a student is committed to enrolling in course work required for completion of that degree. A student will not be allowed to continue as a candidate for a second undergraduate degree if not enrolled in courses required for the second bachelor's degree.

## Double Majors

A number of Arts and Science students choose to complete multiple majors while earning one degree. The requirements of each major, along with requirements for the degree, must be completed. Often, this does not result in the addition of hours to the degree program.

## Graduate School Dual Enrollment

A final-semester senior may dually enroll in the College of Arts and Science and the Graduate School with permission of the deans of both divisions. This enables the student to complete some graduate course work prior to receiving the bachelor's degree.

The student must be within 15 credits of completion of the bachelor's degree and must rank in the upper half of the class.

Application forms for dual enrollment in these two schools may be obtained from the Graduate School Dean in 210 Jesse Hall.

## Advising

Students who have declared a major are assigned an advisor in that department. Students who have not yet decided on a major are assigned to a professional advisor in the Student Success Center.

## Career Placement

Employment opportunities in the various disciplines of the liberal arts vary greatly. Most departments in the college have printed information available describing employment opportunities. The MU Career Center in the Student Success Center offers students a variety of career planning services.

## Air Force Reserve Officer Training Corps (AFROTC)

The AFROTC provides the opportunity to become a United States Air Force officer while completing a college degree. The program combines traditional undergraduate education with military instruction in preparation for Air Force leadership challenges. Each semester academic AFROTC classes will build a foundation for application to a two-hour Leadership Lab. Scholarships are available. Visit [www.afrotc.com](http://www.afrotc.com) (<http://www.afrotc.com>) for the most current information. After graduating from college and successfully completing all AFROTC requirements, cadets receive a commission as a second lieutenant with an obligation of four years of service in the active duty Air Force. Pilots incur a ten-year commitment from the date of graduation from pilot training. A few additional career fields require a six or eight year commitment.

MU also offers a Minor in Aerospace Studies (p. 304).

For additional information contact:

Department of Aerospace Studies  
217 Crowder Hall  
573-882-7621  
[airforce.missouri.edu](http://airforce.missouri.edu)

## Army Reserve Officer Training Corps (AROTC)

Army ROTC is a college elective program that teaches the skills needed to succeed in the Army or the corporate world. Students combine classroom time with hands-on experience and learn leadership and management skills. The experience of Army ROTC provides the confidence needed to excel in college and beyond. The Army ROTC program can be completed through a two- to four-year program designed to develop young men and women into junior commissioned officers in the Active Army, Army Reserve, or Army National Guard. In addition to traditional combat roles, Army officers serve in such professional fields as aviation, medical service, finance, personnel management, communications and engineering. MU also offers a Minor in Military Science (p. 307).

For additional information contact:

Department of Military Science and Leadership  
202 Crowder Hall  
573-882-7721  
<http://armyrotc.missouri.edu/>

## Graduate

College of Arts & Science  
107 Lowry Hall  
(573) 882-6411  
<http://coas.missouri.edu/>

The College of Arts and Science is home to a broad spectrum of disciplines that prepare graduate students for challenging and rewarding careers. Our faculty mentors are known for both research and teaching excellence and many have received national acclaim for discoveries, disciplinary leadership, creative works and music or theater performance.

The [School of Music](#), housed within the College, offers masters degrees, a doctoral degree and a graduate certificate in jazz studies. Music education degrees are offered in conjunction with the College of Education, Department of Learning, Teaching and Curriculum.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Anthropology

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R. L. Lyman, Chair  
College of Arts and Science  
107 Swallow Hall  
(573) 882-4731  
Fax: (573) 884-5450  
<http://anthropology.missouri.edu>

Anthropology is the study of human biology, behavior, language, and culture through comparative, evolutionary, and historical perspectives. Theoretically driven and research oriented, the Department of Anthropology at MU aims to advance scientific, anthropologically informed knowledge, with a general emphasis on Human Adaptation, Ecology, and Evolution.

MU Anthropology students study the whole of humanity - our history, variability, artifacts, customs, and value systems. This holistic approach produces sophisticated problem-solvers, which today's increasingly complex and conflict-prone world needs.

### Faculty

**Professor** M. V. Flinn\*\*, R. L. Lyman\*\*, M. J. O'Brien\*\*, D. M. Pearsall\*\*, L. Sattenspiel\*\*

**Associate Professor** C. T. Palmer\*\*, T. L. VanPool\*\*

**Professor** G. E. Blomquist\*\*, L. Cowgill\*\*, K. Panchanathan\*\*, M. K. Shenk\*\*, C. S. VanPool\*\*, R. Walker\*\*

Note: All permanent faculty members in the department serve as undergraduate advisors for anthropology majors.

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

#### Advising Contact

Cynthia Irsik  
107 Swallow Hall  
[IrsikC@missouri.edu](mailto:IrsikC@missouri.edu)

- Department Level Requirements (p. 134)
- BA in Anthropology (p. 134)
- Minor in Anthropology (p. 135)

Anthropology is the study of humans and their cultures at different levels of social complexity, in different environments and at different times and places. Anthropologists view and compare human populations across cultures and consider the interplay between biology and culture in forming human behavior. Anthropological study has four foci:

- Biological anthropology; the study of the evolution and biology of humans and other primates
- Cultural anthropology; the study of the various ways of life of recent and present-day peoples

- Archaeology; the study of past cultures through analysis of their material remains
  - Linguistic anthropology; the study of language in its cultural context
- Each of these contributes to a discipline that attempts to understand how and why humans look and behave the way they do.

An undergraduate major in anthropology results in a broad educational base that can be the core of a liberal arts education or the background for specific vocational or professional goals of a student. Anthropology is of particular value to students planning professional careers in a world of cultural and ethnic diversity. Anthropology majors are required to take core courses in three areas of the discipline, but may emphasize one or more of them in their remaining courses. Students may also develop an interdisciplinary program in cooperation with other departments or schools. In addition, the department offers an anthropology minor to students who are majoring in other departments and who will profit by more formal training in the discipline.

The Department of Anthropology provides many opportunities for students to become involved in research and encourages all students to do so. Such experiences help a student develop creativity, critical thinking skills, and skills in problem solving and writing. Students who are interested in doing anthropological research have several options, including both working in close conjunction with a faculty member and working on an independent project, which may lead to an honors degree for eligible students.

Undergraduate training in anthropology prepares students for work in government agencies (both in the United States and overseas), museum positions and field positions in, for example, archaeology, ethnography, human paleontology, death investigation or linguistic studies. It also prepares students for graduate study leading toward college or university teaching of anthropology. An anthropology degree also provides good background for careers in business, journalism, health care, law and many other fields.

The Department of Anthropology has a number of special facilities that are available for use in classes, for individual research opportunities, and in some cases, for the general public to visit. The list is included below. Students interested in additional information are encouraged to consult the following web site: <http://anthropology.missouri.edu/facilities.html>.

These special facilities include:

The Museum of Anthropology and Museum Support Center  
The Human Skeletal Remains Identification Laboratory  
The Paleoethnobotany Laboratory  
The Zooarchaeology Laboratory  
The Fossil Cast Collection

### Departmental Honors

The departmental program leading to the BA with Honors in Anthropology is designed for students who desire a more intensive experience in anthropology and who wish to work closely with a particular faculty member in the Anthropology Department on an independent research or scholarly project. To be accepted into and remain eligible for the honors program in the Department of Anthropology, the student must achieve and maintain a minimum cumulative GPA of 3.3 in all University course work and must maintain a GPA of 3.5 in all anthropology courses.

A student wishing to graduate with departmental honors must fulfill the basic course requirements for the BA with a major in Anthropology. In addition, the student, with the assistance of the honors advisor, is expected to develop, plan and conduct research on an independent

project. It is recommended that students in the honors program enroll in ANTHRO 4950H Honors Research in Anthropology, although projects initiated in other courses or through independent, noncredit research experiences may also be honors eligible.

To complete the honors degree, a student must submit the results of the research project as a formal honors thesis (or other evidence of scholarly achievement) that the student defends during an oral examination conducted by an examining committee. The committee consists of three faculty members: the advisor, another faculty member and the departmental honors director. The examination is scheduled no later than the thirteenth week of the term during which the student expects to graduate. Each member of the committee is furnished with a copy of the student's thesis or evidence of scholarly activity at least ten days before the examination. After the oral defense, the student furnishes the department with one final copy of the thesis or evidence of scholarly achievement (e.g., photographs) suitable for preservation in the departmental archive. Upon completion of the program, the examining committee recommends to the Dean of the College of Arts and Science that the student be awarded a BA with Honors in Anthropology.

## Graduate

Anthropology Graduate Programs  
College of Arts and Science  
107 Swallow Hall  
573-882-4731  
<http://anthropology.missouri.edu/>

**Director of Graduate Studies:** Todd Van Pool

- MA in Anthropology (p. 135) (Track One Applicants)
- PhD in Anthropology (p. 136) (Track Two or Track Three Applicants)

The Department of Anthropology offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy. The master's degree program of study is designed to provide broad training in anthropology. At the doctoral level, the student pursues individual, specialized study. The graduate program provides rigorous coursework in combination with hands-on field and laboratory research experience. Our department has a broad scientific approach, with emphasis on theoretical grounding in ecological and evolutionary theory.

Graduate training is offered in three traditional research areas of anthropology: cultural anthropology, physical/biological anthropology, and archaeology. Areas of specialization reflect the active research interests of the MU Anthropology faculty and currently include:

- Social/cultural anthropology: human behavioral ecology, medical anthropology, biocultural anthropology.
- Biological anthropology: skeletal biology, human osteology, demography, epidemiology, primate genetics.
- Archaeology: archaeological theory, evolutionary archaeology, zooarchaeology, paleoethnobotany, lithic artifact analysis, ceramic analysis, material sourcing studies

Incoming graduate students are admitted into one of three tracks:

### Track One: MA students

Students admitted to this track will be classified as MA seeking students with the graduate school. These students will complete all requirements for the MA degree as currently outlined in the Anthropology graduate program, including the MA exam and completing a thesis. Upon

completion, the student can, if eligible, apply to the Anthropology program for acceptance as a PhD seeking student.

### Track Two: PhD students required to complete MA coursework

Students admitted to this track will be classified as PhD seeking students with the graduate school. These students will complete all course requirements for the MA, as well as the MA exam. With the consent of the student's committee, they will then complete either a thesis, OR a proposal that will serve as their PhD dissertation proposal, OR a published, primary authored paper. In each of these cases, the student will still need to orally defend the work. Upon successful completion of these requirements, they will be awarded an MA, and will then be eligible to continue work towards their PhD without the need of reapplying to the program or changing their student status.

### Track Three: PhD students with MA in hand

Students admitted to this track will be classified as PhD seeking students with the graduate school. They will not be required to complete the MA exam or prepare a thesis, proposal or published paper, nor will they earn an MA during their graduate work at Mizzou. Upon completion of the requirements currently listed for the Department's PhD program, the student will be awarded a PhD.

The department also participates in the graduate minor in Ancient Studies and the certificate program in Conservation Biology.

## Facilities and Collections

Departmental research facilities/collections include a paleoethnobotany laboratory, a ceramic analysis laboratory, a stone artifact analysis laboratory, a comparative faunal collection, a skeletal biology laboratory, extensive holdings of New World (especially Missouri) archaeological and skeletal materials and ethnographic specimens from many parts of the world. The department's Museum of Anthropology provides opportunities for museum-oriented studies (see also the Museum Studies Graduate Minor). The Museum Support Center, an archaeological research and curation facility is located on the edge of campus. The University of Missouri Herbarium is also housed in this facility. The University of Missouri Research Reactor provides opportunities for students interested in archaeometry. Resources in other departments or research units available by arrangement include the Archaeometrics Laboratory of the Research Reactor, the Electron Microscopy Facility, and the Stable Isotope Laboratory of the Department of Geological Sciences.

## Research by Location

Regular faculty members of the department conduct research in the following geographical areas, beyond Missouri: the Northwest (archaeology), Europe (biological anthropology), the Mississippi River Valley (archaeology), Canada (biological and cultural anthropology), Ecuador and Peru (archaeology), South Asia—India and Bangladesh (cultural anthropology), Dominica and Amazonia (biological & cultural anthropology), and the North American Southwest (archaeology). Refer to the faculty list for interests of emeritus faculty.

## Internal Funding Opportunities

Teaching, research and student assistantships, fellowships and scholarships are available to qualified graduate students on a competitive basis. Applications for financial assistance should accompany application for admittance to the graduate program in anthropology. Refer to the

departmental site (<http://anthropology.missouri.edu>) for applications and due dates.

## Undergraduate

# Department Level Requirements - Anthropology

## Goals of the Anthropology Curriculum

Students completing an anthropology degree are awarded a BA degree with a major in Anthropology or a BA degree with Honors in Anthropology. The undergraduate program is designed to help students develop an appreciation of other cultures and other world views and to gain an understanding of how and why the diversity in human culture and biology came about. Several goals help faculty teach undergraduates about the nature of the discipline and how to think critically about what it is, what it means and how it is useful in today's society. These goals include:

- To recognize the broad, cross-cultural generalizations that characterize anthropology
- To recognize the value of a cross-cultural, comparative perspective
- To acquire an understanding of the basic concepts in the subfields of anthropology
- To acquire advanced knowledge in one or more of the subfields
- To acquire an awareness of the interrelationship of the subfields
- To think critically about the nature and content of anthropological questions
- To assess the structure of an argument and evaluate it and its supporting information
- To communicate effectively in writing or through oral presentation
- To strive for innovative and creative thinking
- To think independently both within and outside anthropology

Students are also encouraged to acquire experience in research design and methods (e.g., using the library and internet effectively to gather information on a problem, or understanding and using the methods of one or more subfield). To this end, the department provides abundant opportunities for students to work with faculty members on independent research projects.

## GPA Requirements

The College of Arts and Science requires that students attain a minimum GPA of 2.0 in all courses in their major department. In addition, all core courses in anthropology (ANTHRO 2051/ANTHRO 2052 or ANTHRO 2050, ANTHRO 2021/ANTHRO 2022 or ANTHRO 2020, ANTHRO 2030 and ANTHRO 4990) must be completed with a grade of C- or higher. Students may receive a grade below C- in no more than one other course used to satisfy the major.

## BA in Anthropology

### Major Program Requirements

In addition to college foundation requirements and University graduation requirements, such as general education (p. 18), and the Department

Level Requirements (p. 134), all anthropology students are required to complete the following core courses (15 credits):

ANTHRO 2020	Fundamentals of Archaeology with Laboratory	4
or ANTHRO 2021	Fundamentals of Archaeology & ANTHRO 2022 and Fundamentals of Archaeology Lab	
ANTHRO 2030	Cultural Anthropology	3
ANTHRO 2050	Introduction to Biological Anthropology with Laboratory	5
or ANTHRO 2051	Introduction to Biological Anthropology & ANTHRO 2052 and Biological Anthropology Laboratory	
ANTHRO 4990	Capstone Seminar in Anthropology	3
<b>Total Credits</b>		<b>15</b>

ANTHRO 4990 Capstone Seminar in Anthropology must be completed even if a student completes an additional major in another department. Some departments waive this requirement for students completing a double major. Students with second majors should check with the other department to see if they are required to complete both capstone courses.

## Electives

A minimum of five additional Anthropology courses (at least 15 credits) are required for the major. These courses must be distributed as follows:

Topical/theoretical	1
	course
Area	1
	course
Methods	1
	course
Two additional courses of student's choice	2
	courses

Explanation about the distribution of departmental courses among these three categories is available at <http://anthropology.missouri.edu/programs/undergrad/bachelors.html>.

The choice of area, topical-theoretical and methods courses is guided by the student's individual interests and goals, and is selected in consultation with the advisor. With the consent of the student's advisor and the director of undergraduate studies, the methods/techniques or area requirements may be fulfilled by suitable courses outside anthropology. If this requirement is satisfied by a course outside anthropology, an additional anthropology course is selected to complete the 30 credits required in anthropology.

Students may also complete the methods requirement by gaining hands-on experience doing anthropological research. This experience will normally begin with ANTHRO 2950 Research Skills in Anthropology, an introduction to the methods used by one or more faculty members. This course will satisfy the methods requirement if a student enrolls in it for at least 3 credits. A student may independently choose a faculty mentor and arrange for course credit or can work with the department's undergraduate research coordinator, who will match the student's interests with those of one or more faculty members.

Students wishing to continue doing research of an independent nature may register for ANTHRO 4950 Undergraduate Research in Anthropology or for . Prior approval by the director of undergraduate studies is required to use these courses to satisfy the departmental methods requirement. Honors Research may be used to satisfy the

requirements for an Honors BA with a major in Anthropology, but the course is not required for that degree. Specific requirements for the Honors BA are described below.

## Related Courses

Because of the interdisciplinary nature of anthropology, the Department of Anthropology strongly recommends that all students complete a cluster of at least two or three courses that complement chosen courses within the major.

These courses may be offered by a single department or may be a related set of courses from several departments (e.g., courses in ancient history from both the Art History and Archaeology and the History departments). The courses should be chosen with the advisor and are intended to provide background in the content of other disciplines related to the student's anthropological focus. Fulfillment of a formal minor (15 credits in another department as approved by that department) or a second major (at least 30 credits in another department as approved by that department) can also be an effective way to gain expertise in related areas.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ANTHRO 2030 <sup>^</sup>	3	ANTHRO 2020 <sup>^</sup>	4
ENGLISH 1000 <sup>*</sup>	3	MATH 1100	3
HIST 1100 or POL_SC 1100 <sup>*</sup>	3	Behavioral science course <sup>*</sup>	3
Foreign language 1 <sup>*</sup>	5	Foreign language 2 <sup>*</sup>	5
		Elective	3
	14		18
Second Year			
Fall	Credits	Spring	Credits
Anthropology topics course <sup>^</sup>	3	ANTHRO 2050 <sup>^</sup>	5
Foreign language 3 <sup>*</sup>	3	Laboratory science <sup>*</sup>	2
Science course <sup>*</sup>	3	Behavioral science (upper level) <sup>*</sup>	3
Social science course <sup>*</sup>	3	Humanities course <sup>*</sup>	3
Humanities course <sup>*</sup>	3	Elective	3
	15		16
Third Year			
Fall	Credits	Spring	Credits
Anthropology elective <sup>^</sup>	3	Anthropology methods course <sup>^</sup>	3-5
Anthropology area course <sup>^</sup>	3	WI course <sup>*</sup>	3
Science course (if needed) <sup>*</sup>	3	Humanities (upper level) <sup>*</sup>	3
Social science (upper level) <sup>*</sup>	3	Related field course (recommended) <sup>^</sup>	3
Humanities course <sup>*</sup>	3	Elective	3
	15		15-17

Fourth Year			
Fall	Credits	Spring	Credits
Anthropology elective <sup>^</sup>	3	Capstone Seminar in Anthropology (WI) <sup>^*</sup>	3
Related field course (recommended) <sup>^</sup>	3	Related field course (recommended) <sup>^</sup>	3
Electives	9	Electives	9-11
	15		15-17
Total Credits: 123-127			

\* Course meets University general education and/or campus graduation requirements.

<sup>^</sup> Course meets degree program requirements.

## Minor in Anthropology

A student wishing to minor in anthropology should contact the Director of Undergraduate Studies. The requirements for a minor in anthropology are:

- A total of 15 credits in anthropology approved by the director of undergraduate studies.
- No more than 6 of the 15 credits required for the minor may be drawn from courses numbered below 2000. In addition, a minimum of 3 credits must be in courses numbered 3000 or above.
- Readings, research or problems courses may constitute no more than 6 of the required 15 credits.

## Graduate

### MA in Anthropology

Anthropology Graduate Programs  
 College of Arts and Science  
 107 Swallow Hall  
 573-882-4731  
 Contact: Cynthia Irsik

### Admission Criteria (Track One, MA Applicants)

Students admitted to this track will be classified as MA seeking students with the graduate school. These students will complete all requirements for the MA degree as currently outlined in the Anthropology graduate program, including the MA exam and completing a thesis. Upon completion, the student can, if eligible, apply to the Anthropology program for acceptance as a PhD seeking student.

Fall deadline: January 10

Spring deadline: October 15 (no departmental financial aid available this term)

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical

Prior to August 1, 2011	1000	3.0
On or After August 1, 2011	300	3.0

## Required Application Materials

Minimum GPA: 3.25 in last 60 hours and in all anthropology courses

Letters of recommendation: 3

Statement of intent

Some of these requirements may be waived in exceptional cases.

Acceptance into the graduate program in anthropology is not limited to students with undergraduate degrees in anthropology.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents except transcripts
- 3 letters of recommendation (through online application)
- Department of Anthropology application
- Official GRE scores
- Statement of purpose
- Teaching assistant financial aid form (recommended)

To the Anthropology Program (<http://anthropology.missouri.edu>):

- Official transcripts

## Financial Aid from the Program

The teaching assistant financial aid form is required for consideration for financial aid.

## Graduation Requirements (Track One)

A student is expected to have advanced knowledge in the three subfields represented in our program (archaeology, biological anthropology, cultural anthropology) and understand the relationships among them upon completion of the MA degree. Opportunities for specialization are provided through research courses leading to a thesis. A program tailored to each student's educational objectives is planned by the student and the advisory committee of at least three members, one of whom is a non-anthropology faculty member.

## Credit Hours Required for Master's Degree

Students must complete a minimum of 30 credit hours beyond the Bachelor of Arts degree. At least 9 of the required hours must be 8000-level anthropology courses and seminars, and must include at least one content course (i.e., not a readings or research course). In addition to the 8000-level requirement, all students must take ANTHRO 8010 History of Anthropology I. Students must also take one (1) course of their choosing in archaeology and one (1) course of their choosing in biological anthropology. A maximum of 12 hours may be in non-thesis research (ANTHRO 7990/ANTHRO 8990) or reading courses (ANTHRO 7960).

## Statistics Component

Students lacking a basic course in statistics are required to take at least one course, preferably during the first year of graduate work.

## Breadth of Knowledge

Completion of at least one graduate course in each of the three subfields reflected in our department is required. The MA exam will include information from the three areas.

## Examination

After completing 27 credit hours, the student must pass the oral MA examination.

*An oral exam that:*

1) is taken no later than the semester following the successful completion of 27 hours in our graduate program.

2) is administered by an examination committee consisting of the student's advisor and one member randomly drawn from each of the other two subfields (linguistics excepted).

3) lasts no longer than 2 hours.

4) is designed to determine if the student has both sufficient breadth of knowledge in all three/four sub-fields to teach introductory anthropology courses such as ANTHRO 1000 and some current knowledge on at least one sub-field of their choice.

5) If, in the examining committee's opinion, the student has satisfactorily shown competency in all areas except one, then the committee may give the student a conditional pass and require them to write an essay on a specified topic within the inadequate area rather than retaking the entire oral exam. This essay must be approved by the committee before the student is deemed to have passed the exam.

6) can be retaken one, and only one, time.

7) must be successfully passed before the student can defend his or her MA Thesis.

8) includes 5 or more general questions each sub-field has agreed upon earlier and made available to the student to help the student prepare for the exam. This ensures consistency among examinations. Questions asked during the examination should build upon these topics, and can (and should) vary from the limited number of specific questions, especially as related to the student's interests or perceived weaknesses.

## Residency Requirement

The Department of Anthropology residency requirement is two consecutive 9-hour semesters, or three consecutive 6-hour semesters.

## Thesis (Track One) or thesis, proposal or published paper (Track Two)

A thesis (Track One) or thesis, proposal or published paper (Track Two), for a minimum of three hours and a maximum of six hours of credit (ANTHRO 8090), is required for the master's degree.

## PhD in Anthropology

Department of Anthropology

107 Swallow Hall

573-882-4731

## A Note About PhD Specialization

The doctoral candidate normally specializes in one of the recognized subfields of anthropology or, in consultation with a doctoral program



committee, chooses an area of specialization that either cuts across some of the recognized divisions or includes some area outside traditional anthropology. Traditional areas of specialization currently offered include: Social/cultural anthropology, ecological and environmental anthropology, human behavioral ecology, anthropological demography. Biological anthropology, skeletal biology, human osteology, human evolution, demography, epidemiology. Archaeology, chronology, materials research, zooarchaeology, paleoethnobotany, lithic analysis, ceramic analysis, evolutionary archaeology, symbolic analysis, archaeological method and theory.

## Admission Criteria - Track Two PhD Applicants (need to complete MA)

Students admitted to this track will be classified as MA seeking students with the graduate school. These students will complete all requirements for the MA degree as currently outlined in the Anthropology graduate program, including the MA exam and completing a thesis. Upon completion, the student can, if eligible, apply to the Anthropology program for acceptance as a PhD seeking student.

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	3.0
On or After August 1, 2011	300	3.0

- Minimum GPA: 3.25 in last 60 hours and in all anthropology courses

Note: Some of these requirements may be waived in exceptional cases. Acceptance into the graduate program in anthropology is not limited to students with undergraduate degrees in anthropology.

## Required Application Materials For Track Two Applicants:

*To the Graduate School:*

- All required Graduate School documents except transcripts
- 3 letters of recommendation (through online application)
- Department of Anthropology application
- Official GRE scores
- Statement of purpose
- Teaching assistant financial aid form (recommended)

*To the Anthropology Program:*

- Official transcripts

## Financial Aid from the Program

The teaching assistant financial aid form is required for consideration for financial aid.

## Credit Hours Required for Master's Degree (Track Two Applicants Only)

Students must complete a minimum of 30 credit hours beyond the Bachelor of Arts degree. At least 9 of the required hours must be 8000-level anthropology courses and seminars, and must include at least one content course (i.e., not a readings or research course). In addition to

the 8000-level requirement, all students must take Anthropology 8010 (Cultural Anthropology Theory). Students must also take one (1) course of their choosing in archaeology and one (1) course of their choosing in biological anthropology. A maximum of 12 hours may be in non-thesis research (Anthropology 7990/8990) or reading courses (Anthropology 7960).

## Statistics Component

Students lacking a basic course in statistics are required to take at least one course, preferably during the first year of graduate work.

## Breadth of Knowledge

Completion of at least one graduate course in each of the three subfields reflected in our department is required. The MA exam will include information from the three areas.

## Examination

After completing 27 credit hours, the student must pass the oral MA examination.

*An oral exam that:*

- 1) is taken no later than the semester following the successful completion of 27 hours in our graduate program.
- 2) is administered by an examination committee consisting of the student's advisor and one member randomly drawn from each of the other two subfields (linguistics excepted).
- 3) lasts no longer than 2 hours.
- 4) is designed to determine if the student has both sufficient breadth of knowledge in all three/four sub-fields to teach introductory anthropology courses such as anth 1000 and some current knowledge on at least one sub-field of their choice.
- 5) If, in the examining committee's opinion, the student has satisfactorily shown competency in all areas except one, then the committee may give the student a conditional pass and require them to write an essay on a specified topic within the inadequate area rather than retaking the entire oral exam. This essay must be approved by the committee before the student is deemed to have passed the exam.
- 6) can be retaken one, and only one, time.
- 7) must be successfully passed before the student can defend his or her MA Thesis.
- 8) includes 5 or more general questions each sub-field has agreed upon earlier and made available to the student to help the student prepare for the exam. This ensures consistency among examinations. Questions asked during the examination should build upon these topics, and can (and should) vary from the limited number of specific questions, especially as related to the student's interests or perceived weaknesses.

## Residency Requirement

The Department of Anthropology residency requirement is two consecutive 9-hour semesters, or three consecutive 6-hour semesters.

## Thesis, Proposal or Published Paper (Track Two Only)

Track Two students must submit thesis, proposal or published paper for a minimum of three hours and a maximum of six hours of credit (Anthropology 8090), is required for the master's degree.

## Admission Criteria - Track Three Applicants (already earned the MA)

Students admitted to this track will be classified as PhD seeking students with the graduate school. They will not be required to complete the MA exam or prepare a thesis, proposal or published paper, nor will they earn an MA during their graduate work at Mizzou. Upon completion of the requirements currently listed for the Department's PhD program, the student will be awarded a PhD.

Fall deadline: January 10  
 Spring deadline: October 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	3.0
On or After August 1, 2011	300	3.0

- Minimum GPA: 3.5 in previous graduate work
- Master's degree

**Note:** A faculty who is a member of the doctoral faculty must agree, as a condition of admission, to accept the student as a PhD advisee. These qualifications apply to all applicants, including those with an MA degree from this department. Applicants whose MA is in a field other than anthropology will be considered under the policies for individuals holding the baccalaureate degree except that the quality of graduate work will be taken into consideration.

## Required Application Materials for Track Three Applicants

*To the Graduate School:*

- All required Graduate School documents except transcripts
- 3 letters of recommendation (through online application)
- Department of Anthropology application
- Official GRE scores
- Statement of purpose
- Teaching assistant financial aid form (recommended)

*To the Anthropology Program:*

- Official transcripts

## Financial Aid from the Program

The teaching assistant financial aid form is required for consideration for financial aid.

## Art

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M. Platt, Chair  
College of Arts and Science  
A126 Fine Arts Building  
(573) 882-3555  
<http://art.missouri.edu>  
[umcart@missouri.edu](mailto:umcart@missouri.edu)

The Department of Art is housed principally within the Fine Arts Building. Founded in 1877, the Art Department faculty consists of 20 full-time faculty, 11 adjunct instructors, and 27 graduate teaching assistants. Our faculty members, many of whom are nationally and internationally renowned, are well-established professional artists and designers with numerous exhibitions, commissions, and awards to their credit.

Our studio/laboratory spaces for each media area have impressive features that include a fully-equipped printmaking studio, photography labs for digital and traditional processes, a papermaking/fiber facility, an anagama kiln, a bronze casting facility, and three state-of-the-art digital labs housing over 65 up-to-date Macintosh computers with large 27-inch monitors, three 44" large-format Epson printers, and a variety of video equipment. The Department of Art also operates the George Caleb Bingham Gallery (<http://binghamgallery.missouri.edu>) in the Fine Arts Building, which showcases art exhibitions from students, faculty, and visiting artists year-round. A popular Visiting Artists Lecture Series is presented on late Wednesday afternoons during the Fall and Spring semesters and is open to the public. A popular summer experience sponsored by the Department in partnership with the International Center is the Summer Study Abroad Program ([http://art.missouri.edu/undergraduate/study\\_abroad.htm](http://art.missouri.edu/undergraduate/study_abroad.htm)) that takes place in summers in Italy on odd-numbered years and in the Netherlands and Belgium in even-numbered years. In both countries, students will have the opportunity to study firsthand many of the most important masterpieces in Western art history.

Faculty and students have access to many other resources on the University campus, including the Museum of Art and Archaeology (<http://maa.missouri.edu>), the State Historical Society of Missouri (<http://shs.umsystem.edu>), the Craft Studio Gallery (<http://www.craftstudio.org>), extensive collections of Ellis Library (<http://mulibraries.missouri.edu/collections/ellis.htm>), and the image database on ArtStor (<http://www.artstor.org>).

You should not be surprised to find the works of MU art faculty and alumni in major museums, galleries, exhibitions, and collections around the world, from New York to Barcelona, and from Africa to China. The work of our faculty and alumni exemplifies the caliber of teaching and creativity that students experience in the MU Art Department. We are dedicated to providing our students with the best quality education possible and helping them to develop and nurture their artistic pursuits.

## Faculty

**Professor** J. M. Brueggenjohann\*, R. B. Clarke\*, A. W. Hoard\*, L. Leong\*, J. Stealey\*  
**Associate Professor** N. Boyer\*, J. H. Calvin\*, J. B. Grill\*, W. A. Hawk\*, D. L. Huelsbergen\*, C. Sampson\*, R. A. Wilson\*  
**Assistant Professor** C. Daniggelis\*, D. Farnum\*, J. Johnson\*, J. Pintz, A. Thompson\*, J. Thornton\*

**Assistant Teaching Professor** M. Ballou\*, M. G. Langeneckert\*, C. Stigliani\*

**Professor Emeritus** J. D. Berneche, R. F. Bussabarger, B. B. Cameron\*, L. Kantner, L. Rugolo, O. A. Schuchard, F. H. Stack

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 140)
- BA in Art (p. 140)
- BFA in Art (p. 141)
- Minor in Art (p. 142)

The Department of Art in the College of Arts & Science offers a BA and a BFA. A minor in Art is also available. Students have the option to take studio courses in drawing, painting, printmaking, ceramics, sculpture, fibers, photography, digital/experimental media, and graphic design.

The BA degree is intended for the student desiring a liberal education with a concentration in art, while the BFA provides more professional training in the studio area. The BFA is the required undergraduate degree for admission to most Master of Fine Arts programs.

Students who wish to teach at the elementary and/or secondary school level normally pursue the BS in Education degree. BA and BFA candidates may acquire elementary or secondary art teaching certification by completing the additional art education requirements not already completed in their BA or BFA programs.

## Graduate

Department of Art  
A126 Fine Arts Building  
Columbia, MO 65211-6090  
573-882-3255  
<http://art.missouri.edu/grad>

**Director of Graduate Studies:** J. Brett Grill

Admission Contact:  
Brenda J. Warren, Graduate Student Coordinator  
[warrenb@missouri.edu](mailto:warrenb@missouri.edu)

- MFA in Art (p. 142)

The Department of Art offers a Master of Fine Arts (MFA) program that focuses on the creative goals of the individual. Our aim is to guide each student to finding and developing a particular direction and language as demonstrated by a coherent and conceptually unified body of artwork. Through an intense studio-based practice, our graduates develop into professional artists and college level educators who will successfully contribute to the culture on a local, national and global scale through different fields in the visual arts.

The University of Missouri has been a leader in the visual arts since 1877 when the renowned painter George Caleb Bingham began teaching the first studio courses in the newly formed School of Art. Current faculty members follow in that tradition through their creative work that is

nationally and internationally recognized. Their artwork encompasses: abstract and figurative painting and drawing, ceramics, sculpture, ceramics sculpture, as well as bronze cast sculpture, traditional and digital photography, all media of printmaking, surface design, illustration, papermaking and book arts, mixed-media, video, installation and performance art plus intermedia and intradmedia approaches. They are all are eager to mentor young artists who share the passion for creativity, critical thinking and the arts.

Laboratory facilities are available in all media areas that are continually updated to coincide with technological advancements. The Department of Art is home to the George Caleb Bingham Gallery with monthly exhibitions highlight artwork by students, local, regional and national artists. Our yearly Florence Summer Study Abroad Program places students in Italy where students have a month to study firsthand many of the most important masterpieces in Western art history. More about the MFA program. (<http://art.missouri.edu/mfa-program.html>)

## Study Areas

Applicants typically study within a particular art medium. Applicants declare a media emphasis of their choice at the time of application to the program. Media areas for selection include ceramics, drawing, fibers, graphic design, painting, photography, printmaking, and sculpture. Aspects of new media (2D and 3D computer imaging and animation, video production, web publishing and other digital media) are also integrated into the curriculum of many of the listed traditional media.

## Financial Aid

Fellowships, scholarships, and tuition waivers, along with graduate teaching assistantships and graduate research assistantships with stipends are available to qualified graduate students. Assistantships include stipends. Some aid is awarded upon acceptance into the program, while others may be awarded later as the student develops within the program. Applications for graduate teaching assistantships should be submitted along with the application portfolio to the director of graduate studies. Application instructions follow later in this document. For a list of scholarships within the Department of Art, please visit the departmental website at: <http://art.missouri.edu/mfa-program/scholarships.html>

Some campus-wide opportunities are available, too. Most prominent would be the Mizzou Graduate Fellowship that is available for applicants for the fall semester (submitting deadline on January 1st each year) only.

## Advising

Upon admission to the program, a candidate is assigned a graduate thesis committee chair/major adviser. This person will mentor the student throughout the student's tenure and help the student to establish the three-member graduate thesis committee. By the second semester the student will select another committee member from the Graduate Faculty to serve as the student's second adviser. The chair/major adviser will also help the graduate student to select an outside member who is from the graduate faculty of another department. In addition, students have access to all the art department faculty members for consultation throughout the duration of their studies.

## Undergraduate

## Department Level Requirements - Art

The Department of Art has no department level requirements. All requirements are specific to either the BA or BFA in Art. The only exception is the Graphic Design media area which requires a portfolio review for admission to the Graphic Design sequence of classes. For information please contact Deborah Huelsbergen, Director of Undergraduate Studies at [huelsbergend@missouri.edu](mailto:huelsbergend@missouri.edu). Please see sections for the BA and BFA in Art (p. 139) further details.

## BA in Art

### Major Program Requirements

Art majors earning a BA degree complete art foundations courses, art core requirements, and art studio electives. No more than 40 credits in studio art may be included in the BA curriculum. Students enrolled in the BA degree program may not include art or art history courses with a grade of D.

All art majors must complete a minimum of 12 credit hours of MU art coursework numbered 2000 or above. In addition, 9 hours of Art History and Archaeology courses, including two 3-hour classes numbered 2000 or above, are required.

In addition, students must complete all College of Arts and Science and University graduation requirements (p. 17), including University general education (p. 18).

#### Major core requirements

Art foundations		
ART_GNRL 1030	Basic 2-D Design	3
ART_GNRL 1040	Basic 3-D Design	3
ART_DRAW 1050	Drawing I	3
Art core requirements		
ART_PNT 2500	Beginning Painting	3
or ART_PNT 2510	Beginning Watercolor Painting	
ART_SCUL 2800	Beginning Sculpture	3
ART_CERM 2100	Beginning Ceramics	3
or ART_FIBR 2300	Beginning Fibers	
ART_GNRL 4975	Senior Seminar in Art	3
or ART_GNRL 4976	Design - Senior Seminar	
ART studio electives (may include 15 credits in one media area)		up to 18
AR H A courses (Art History)		9

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
Art Foundations Course	3	Art Foundations Course	3
MATH 1100 or ENGLISH 1000	3	Foreign Language	5
Humanities Course	3	MATH 1100 or ENGLISH 1000	3
American History or Government Course	3	Behavioral Science	3
	12		14
Second Year			
Fall	Credits	Spring	Credits
Art Foundations Course	3	Foreign Language	3
Foreign Language	5	Art Core Requirement	3
AR_H_A 1110	3	Biological/Physical/Math Science Course (lab)	3
Social Science Course	3	Behavioral Science Course (2000+)	3
Humanities Course	3	Humanities Course	3
	17		15
Third Year			
Fall	Credits	Spring	Credits
Art Core Requirement	3	Art Core Requirement	3
Art Studio Elective	3	Art Studio Elective	3
AR H A Course (2000+)	3	Biological/Physical/Math Science Course	3
Biological/Physical/Math Science Course (MRP)	3	Social Science Course (2000+)	3
Humanities Course	3	General Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
Art Studio Elective	3	Art Studio Elective	3
Art Studio Elective	3	General Elective	3
AR H A Course (2000+, WI)	3	General (or Art) Elective	3
General Elective	3	General Elective	3
General Elective	3	ART_GNRL 4975	3
Humanities Course (2000+)	3		
	18		15
Total Credits: 121			

## BFA in Art

### Major Program Requirements

Art majors earning a BFA degree complete art foundations courses, art core requirements, and art studio electives with 15 credits in one specific media area. Students enrolled in the BFA degree program may not include art or art history courses with a grade of D.

All art students are assigned a departmental faculty advisor. Students are encouraged to meet with the advisor to plan a program of study with a focus in one particular media area.

BFA students complete 60 to 70 credits in studio art, including a minimum of 15 credits in one specific media area, and 12 credits of art history, including at least two 3-hour Art History & Archaeology courses numbered 2000 or above. A minimum of 35 credit hours of studio art coursework must be taken at MU.

In addition, students must complete all College of Arts and Science and University graduation requirements (p. 17), including University general education. (p. 18)

#### Major core requirements:

##### Art foundations

ART\_GNRL 1030 Basic 2-D Design 3

ART\_GNRL 1040 Basic 3-D Design 3

ART\_DRAW Drawing I 3  
1050

##### Art core requirements

Drawing 3

ART\_PNT 2500 Beginning Painting 3

or ART\_PNT Beginning Watercolor Painting 3  
2510

ART\_SCUL 2800 Beginning Sculpture 3

ART\_CERM Beginning Ceramics 3  
2100

and/or ART\_FIBR 2300

ART\_PHOT 2600 Beginning Photography 3

and/or ART\_PRNT 2700

ART\_GNRL 4975 Senior Seminar in Art 3

or ART\_GNRL Design - Senior Seminar 3  
4976

ART media area electives 15  
minimum

ART studio electives up  
to  
19

AR H A courses (Art History and Archaeology) 12

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
Art Foundations Course	3	Art Foundations Course	3
Art Foundations Course	3	Art Core Requirement	3
MATH 1100 or ENGLISH 1000	3	MATH 1100 or ENGLISH 1000	3
American History or Government Course	3	Behavioral Science Course	3
		Humanities Course	3
	12		15

Second Year			
Fall	Credits	Spring	Credits
Art Media Area Course	3	Art Media Course	3
Art Core Requirement Course	3	Art Core Requirement Course	3
AR_H_A 1110	3	Biological/Physical/Math Science Course (MRP)	3
Biological/Physical/Math Science Course (Lab)	3	Behavioral or Social Science Course	3
Humanities Course	3	AR_H_A 1120	3
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
Art Media Area Course	3	Art Media Course	3
Art Core Requirement Course	3	Art Core Requirement Course	3
Art Core Requirement Course	3	Art Core Requirement Course	3
Biological/Physical/Math Science Course	3	General Elective Course	3
AR H A Course (2000+)	3	AR H A Course (2000+, WI)	3
	<b>15</b>		<b>15</b>
Fourth Year			
Fall	Credits	Spring	Credits
Art Media Area Course	3	Art Studio Elective	3
Art Core Requirement Course	3	Art Studio Elective	3
Art Studio Elective Course	3	General Elective Course	3
General Elective Course	3	ART_GNRL 4975	3
General Elective Course	3	General Elective Course	3
Humanities Course (2000+)	3		
	<b>18</b>		<b>15</b>
Total Credits: 120			

## Minor in Art

The minor in art requires a total of 18 credits, including 15 credits in studio art and 3 credits from the Department of Art History & Archaeology. Six credits must be studio art courses numbered 2000 or above. At least 9 of these hours must be taken while in residence at the University of Missouri. An Art Minor may not include art or art history courses with a grade of D.

## Graduate

### MFA in Art

Admission Contact:  
 Brenda J. Warren, Graduate Student Coordinator  
 warrenb@missouri.edu

Department of Art  
 A126 Fine Arts Building  
 University of Missouri  
 Columbia, MO 65211-6090, USA  
 573-882-4037

## Admission Criteria

Fall semester deadline (priority for campus scholarships):

- January 1 if seeking nomination for Mizzou Graduate Fellowship

Spring semester deadline:

- September 1

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GPA: 3.0

The preferred undergraduate degree for admission to the graduate program in visual art is the Bachelor of Fine Arts degree (BFA). However, applicants holding the BA, BS or other bachelor's degrees are eligible to apply if they have a minimum of 40 hours of undergraduate studio credits or an equivalent commensurate professional experience. Applicants for the Graphic Design Area are required to have a minimum of 2 years professional experience before applying.

Application materials are evaluated to determine if the applicant has the preparation and ability to pursue an advanced degree. Admission is based on the recommendations from the art department graduate faculty members representing each of the media areas. Some applicants, may be placed on a waiting list as alternates, then accepted if others decline their admission offers.

## Required Application Materials

Submit to the Graduate School:

- All required Graduate School documents
- Cover Letter of Intent (stating the goals for pursuing the MFA degree)
- A Digital Assets Sheet (defining the image and video files).
- Current Résumé (exhibition, award, publications, artistic experience, etc.)
- An artist's statement
- Three (3) letters of recommendation
- Official transcripts from each college attended
- Application for G.T.A. (optional but necessary for tuition waiver)

Application Materials Submit to the Art Department

- The application process requires a digital portfolio documenting 20 separate pieces of the applicant's artwork. Applicants can document these works using twenty (20) to forty (40) digital still images and/or moving image files. Please limit submissions to a maximum of 2 images for any one piece of artwork. The artwork in the portfolio should represent your most recent and most accomplished body of work. The work should indicate your major artistic interests and creative direction. The work should demonstrate your creative ability and media competence. If you are requesting consideration for a teaching assistantship, a few of the images could be works that demonstrate your foundational mastery of a specific media area. Portfolios must be submitted in digital form on CD only. Please follow closely the instructions for the submission of images available on the department website:

## MFA Degree Completion Requirements

The MFA program consists of 60-70 credit hours.

The degree includes:

- 30 hours in the major area
- 9 hours in a minor area
- 3 hours of Graduate Studio Seminar
- A minimum of 1 hour of MFA Research Hours
- 11 hours of electives
- 6 hours of Art History

## Graduate-Level Course work

Graduate level courses are at the 7000/8000/9000 level. A minimum of 15 of the 30 hours must be selected from courses numbered at 8000 and/or 9000 levels; no more than 40 percent of the 30 hours credit requirement can be satisfied by Research, Readings and Problems courses. No credit is given for courses at the 4000 or below levels.

## Residency Requirement

A minimum residency of two years is required for the degree. However, mere completion of the prescribed number of credit hours and the residency requirement is insufficient, rather the degree will be granted upon the student's high level of creative achievement as determined by the student's graduate thesis committee.

## Regular Student Evaluation

The full graduate faculty of the art department reviews every MFA candidate once each year to determine the rate of progress. If the candidate fails to receive a passing evaluation during the review, the student is placed on probation for one semester and is required to be reviewed the following semester. If two consecutive unsatisfactory reviews occur, the student is dismissed from the MFA program.

## Clearance

During the semester prior to graduation, the graduate thesis committee will approve the student to proceed with the final steps toward graduation, composing the written thesis and mounting the thesis exhibition.

## Thesis Acceptance

The graduate thesis committee approves the thesis exhibition and written thesis. The final semester, the MFA candidate installs a thesis exhibition to display visual, artistic and professional achievement. The candidate thereafter presents a final draft of the written thesis that defends the conceptual and philosophical ideas of the final body of artwork. Photographic record of the pieces discussed must be included in the written thesis.

Each degree candidate must pass a two-hour oral final examination conducted by the graduate thesis committee. The presentation must focus on the aspects of the academic study related to the written thesis and visual work. Following final approval of the thesis exhibition and the written thesis, the graduate will officially submit documentation of the theses to the graduate school. The thesis is submitted as a PDF file on a CD-ROM to the Graduate School by the established deadline.

## Time Limit and Extensions

The time limit for completion of the MFA degree is 5 years. Time spent in military service is excluded. For an extension for other reasons the student must petition the Graduate School through his/her chair/major adviser. The five-year period will extend from the beginning of the first semester of enrollment in which the student is accepted to the MFA degree program to the date of his/her clearance to graduate.

## Art History and Archaeology

S. Langdon, Chair  
College of Arts and Science  
109 Pickard Hall  
(573) 882-6711  
aha@missouri.edu  
<http://aha.missouri.edu>

The development of European and American art in its historic and cultural context is the subject of study in the Department of Art History and Archaeology.

The department offers BA, MA and PhD degrees with a major in Art History and Archaeology.

### Faculty

**Professor** K. L. Eggner\*\*, N. E. Land Jr.\*\*, S. H. Langdon\*\*, M. L. Rautman\*\*, K. W. Slane\*\*

**Associate Professor** K. A. Schwain\*\*, A. R. Stanton\*\*, J. A. van Dyke#, M. E. Yonan\*\*

**Professor Emeritus** W. R. Biers\*, H. W. Marshall\*, O. Overby\*

**Professor Emerita** P. D. Crown\*

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 145)
- BA in Art History and Archaeology (p. 145)
- Minor in Art History and Archaeology (p. 147)

### Double Majors and Dual Degrees

Students may combine a major in art history and archaeology with a major in another department in the College of Arts and Science such as Art or Classical Studies (a double major), or with a major in another college such as Education (a dual major). Students who graduate with dual majors will be awarded two degrees; their program of study will include an additional 12 credits. Students who plan to pursue double or dual majors should complete graduation plans in both departments.

### Departmental Honors

Departmental Honors is intended for students who have a commitment to future professional activity in art history and archaeology, who wish for more substantial research experience, and who have a record of excellence in departmental coursework.

Requirements:

- 3.3 or above Cumulative GPA
- 3.6 Departmental GPA
- Successful completion of one 4000-level AR\_H\_A course as a prerequisite
- Completion of a senior honors essay, AR\_H\_A 4999

The student should apply for departmental honors the semester prior to taking AR\_H\_A 4999 by writing a proposal on the subject of their essay. The proposal is submitted in duplicate to the faculty member whom the student would like to have serve as the project's supervisor and to the Director of Undergraduate Studies, but shall be considered and must be approved by the faculty as a whole. The essay's topic should reflect both the student's interests and the expertise of the faculty supervisor. The honors essay should be of substantial length, incorporate significant individual research, and engage with theoretical, historiographical, and methodological perspectives appropriate to the topic at hand. The minimal required GPA must be maintained through the end of the student's career at MU. Completing these requirements to the faculty's satisfaction will earn the student departmental honors.

### Graduate

Art History & Archaeology Graduate Programs  
College of Arts and Sciences  
109 Pickard Hall  
Columbia, MO 65211  
573-882-6711  
<http://aha.missouri.edu/index.html>

**Director of Graduate Studies:** Keith Eggner

- MA in Art History and Archaeology (p. 147)
- PhD in Art History and Archaeology (p. 148)

### About Art History and Archaeology

The University of Missouri has played a prominent role in the teaching of the visual arts in North America since Walter Miller and John Pickard first began lecturing on campus in the 1890s. Our faculty and staff reflect the widening scope of our discipline with particular strengths in the areas of classical Mediterranean archaeology, medieval and Renaissance art, and the art and architecture of modern Europe and the Americas. Current faculty research interests range from early Greece and Rome to modern architecture and contemporary painting. Resources available to faculty and students include the department's Visual Resources Center and the Museum of Art and Archaeology, both located in Pickard Hall on the historic Francis Quadrangle, as well as the extensive collections of Ellis Library.

### Degrees Offered

The Department of Art History and Archaeology offers the MA and the PhD degrees in art history and classical archaeology. The department participates in interdisciplinary graduate minors in Ancient Studies, Medieval and Renaissance Studies, Museum Studies, and Women's and Gender Studies.

### Funding: Internal and External

The Department of Art History and Archaeology offers two forms of graduate support: teaching assistantships in introductory and upper-level courses; and research assistantships in the Visual Resources Center, which provides students with the opportunity to learn a variety of skills vital to the field in the digital age. In addition, the Museum of Art and Archaeology provides research assistantships that allow students to work closely with curators in various departments of the Museum.

Generally, the department and the museum offer .25 FTE (full time equivalent) assistantships that require approximately ten hours of work per week. These provide a nine-month stipend; a tuition waiver that



covers resident educational and non-resident fees; and a 50% medical insurance subsidy if you enroll in “Student Accident and Sickness Insurance” program. In special circumstances, the Department and the Museum will offer a .5 FTE to advanced students.

Incoming students are considered for funding when they apply to the program. Returning students submit applications for continued funding in the spring semester. The Department follows the rules set by the Graduate School regarding tuition waiver limits.

In addition to teaching and research assistantships, the department may award departmental fellowships to advanced students: the Herbert Schooling Fellowship; the John Pickard Fellowship; and the Walter Miller Fellowship for students in classical archaeology. Holders of these fellowships may, with proper consent, hold additional grants not to exceed \$1000 or may hold teaching assistantships.

Finally, the department offers a number of fellowships and travel awards:

- The Edzard Baumann Traveling Fellowship in European Art
- The Irina Hans Fellowship in Art History
- The Osmund Overby Fund for research in American art, architecture, and historic preservation
- The Saul and Gladys Weinberg Traveling Fellowship for advanced students in classical archaeology

Students interested in these awards should contact the director of graduate studies and their advisors for application instructions.

In addition, the University of Missouri Graduate School sponsors two major fellowship programs: a spring competition and a Supplemental Graduate Fellowship Program. Applicants in both art history and archaeology are eligible for these fellowships, which are awarded to entering students through a campus-wide competition. Nominations for both are completed by the director of graduate studies in consultation with the entire faculty. Students in the Department of Art History and Archaeology have held a number of these awards, including the G. Ellsworth Huggins Scholarship, the Gus T. Ridgel Fellowship, and the Robert E. Waterston Award.

Students enrolled in MA and PhD programs are also eligible for awards from The Graduate Professional Council (GPC), which are designed to assist students who are traveling to present research papers, posters or creative works at conferences or symposia. The Graduate Student Association (GSA) also awards travel grants to students who are presenting a paper or poster, or chairing a plenary session or roundtable discussion, at an academic conference.

Finally, the department encourages graduate students to apply for internships, study abroad programs, grants, and fellowships that support their programs of study. An excellent place to initiate this search is Resources in Art History for Graduate Students: A Newsletter of Fellowships and other Opportunities for Art History Graduate Students [<http://www.efn.org/~acd/resources.html>].

## Undergraduate

## Department Level Requirements - Art History and Archaeology

The Department of Art History and Archaeology has no department level requirements. All requirements are specific to the BA in Art History and Archaeology. Please see this section (p. 145) for further details.

## BA in Art History and Archaeology

### Major Program Requirements

Students may elect a broad program in art history or a more narrowly focused one in classical archaeology. Those who are planning to focus in either program should begin foreign language study as early as possible.

In addition to University general education (p. 18) requirements and other college and University graduation requirements (p. 17), students must meet the following requirements:

<b>Major core requirements</b>	<b>13-19</b>
Students must take 1110 and 1120:	
AR_H_A 1110 Ancient and Medieval Art	6
& AR_H_A 1120 and Renaissance through Modern Art	
OR	
The General Honors Humanities Sequence (GN_HON 2111H, GN_HON 2112H, GN_HON 2113H, GN_HON 2114H)	12
In addition, students must enroll in at least two 4000-level courses (after appropriate prerequisites) and the capstone.	6
AR_H_A 4970 Capstone: Art History and Archaeology	1
One course numbered 4005 through 4960 must be taken in conjunction with AR_H_A 4970 within the last 45 credits.	

### Options

**Note:** Options do not appear on diplomas or transcripts.

#### Art History Option

At least one 3000-level course in each of five fields

Ancient	3
Byzantine-Medieval	3
Renaissance-Baroque	3
18th century to the present	3
Arts of the Americas	3

#### Language Requirement

Study is required through the reading level (i.e., 12 or 13 credits) in one language, such as German, French, Spanish or Italian. Students who plan to attend graduate school are strongly urged to study two languages.

#### Courses Recommended for a Well-Rounded Degree

Humanities courses, such as history, literature, philosophy, aesthetics, film, classical studies or religious studies; anthropology, sociology or environmental design.

### Art courses

Maximum 12 credits; 15, if declared as a minor. Students are strongly urged to take at least one course in studio art.

### Classical Archaeology Option

At least five courses at the 3000-level, including:

- AR\_H\_A 3210 Near Eastern and Egyptian Art and Archaeology 3
- AR\_H\_A 3310 Greek Art and Archaeology 3
- AR\_H\_A 3410 Roman Art and Archaeology 3
- AR\_H\_A 3510 Byzantine and Islamic Art and Archaeology 3
- or AR\_H\_A 3520 Early Medieval Art and Archaeology

Any 3000-level post-ancient lecture course:  
Courses numbered 3520-3850 3

One course numbered 4005 through 4840 must be taken in conjunction with AR\_H\_A 4970: Capstone within the last 45 credits of study for a total of 4 credits. 4

A third 4000-level course may be taken instead of a post-ancient course at the 3000-level.

### Language requirement

Study is required through the reading level (i.e., 13 credits) in Greek or Latin. Students who plan to attend graduate school are very strongly encouraged to study French or German as well.

### Courses recommended for a well-rounded degree

Any course in classics, classical humanities, and ancient history; courses in history, anthropology, philosophy, or religious studies; geology; literature.

### Semester Plans

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
HIST 1100	3	AR_H_A 1120	3
AR_H_A 1110	3	GEOL 1200	4
SOCIOL 1000	3	ANTHRO 1000	3
ART_GNRL 1010	3	BIO_SC 1010	3
	15		16
Second Year			
Fall	Credits	Spring	Credits
AR_H_A 3530	3	AR_H_A 3760	3
GERMAN 1100	5	AR_H_A 3410	3
CL_HUM 1060	3	GERMAN 1200	5
AR_H_A 2830	3	GEOG 1100	3
	14		14
Third Year			
Fall	Credits	Spring	Credits
AR_H_A 3620	3	AR_H_A 3840	3
GERMAN 2100	3	ITAL 2310	3

HIST 1510	3	ENGLISH 2140	3
CL_HUM 2300	3	GEOL 2150	3
ASTRON 1010	4	AR_H_A 4540	3
	16		15
Fourth Year			
Fall	Credits	Spring	Credits
AR_H_A 4630	3	AR_H_A 4820	3
ITAL 2850	3	AR_H_A 4970	1
PHIL 2000	3	REL_ST 3380	3
HIST 3540	3	PHIL 3600	3
REL_ST 3740	3	REL_ST 4110	3
	15		13
Total Credits: 118			

### Sample Eight-Semester Program - Bachelor of Arts with a Major in Art History and Archaeology with Classical Archaeology Option

This outline is only suggested; see the advisor for a more personalized plan.

First Year			
Fall	Credits	Spring	Credits
HIST 1100	3	MATH 1100	3
AR_H_A 1110	3	AR_H_A 1120	3
ENGLISH 1000	3	GEOL 1200	4
LATIN 1100	5	LATIN 1200	5
	14		15
Second Year			
Fall	Credits	Spring	Credits
AR_H_A 3310	3	AR_H_A 3410	3
LATIN 2000	3	CL_HUM 2200	3
CL_HUM 1060	3	ANTHRO 2050	5
HIST 1520	3	SOCIOL 1000	3
ANTHRO 1000	3	GEOL 2150	3
	15		17
Third Year			
Fall	Credits	Spring	Credits
AR_H_A 3510	3	AR_H_A 4360	3
FRENCH 1100	5	FRENCH 1200	5
CL_HUM 2100	3	HIST 1510	3
GEOG 2130	3	HIST 1560	3
HIST 2600	3	HIST 2610	3
	17		17
Fourth Year			
Fall	Credits	Spring	Credits
AR_H_A 4420	3	AR_H_A 4440	3
REL_ST 4110	3	AR_H_A 4970	1
FRENCH 2100	3	CL_HUM 3000	3
CL_HUM 3650	3	CL_HUM 3150	3

PHIL 2000	3	CL_HUM 3600	3
	15		13
Total Credits: 123			

## Degree Audit

The degree audit is an automated report reflecting a student's academic progress toward the completion of a degree.

**MU students who have attended since August 2007** can request a degree audit by logging in to [myZou](#) and navigating to Self Service, then Student Center, and clicking on "Request Degree Audit." The audit automatically pulls in the student's MU course work, transfer courses and courses in progress.

**MU students who have NOT attended since August 2007** can request a degree audit by contacting the Academic Advising Unit of the division in which they were last enrolled at MU. For contact information, go to <http://advising.missouri.edu/contact/>.

**For newly admitted or prospective students**, MU degree audits can be created at <http://www.transfer.org>. Information on the college credits already earned will have to be manually entered before it can be evaluated against current degree requirements.

For additional details on degree audits, go to <http://registrar.missouri.edu/degree-audits/index.php>.

## Minor in Art History and Archaeology

A minor in Art History and Archaeology requires 15 credits within the department. Nine of the 15 credits must be at the 3000-level or above.

## Graduate

## MA in Art History and Archaeology

### Admission Contact Information

Keith Eggener (EggenerK@missouri.edu)  
 109 Pickard Hall  
 Columbia, MO 65211  
 573-882-6711

### About the Master's

The MA program in the Department of Art History and Archaeology has two primary goals: to provide graduate students with a strong background in the history of art, from antiquity to the present; and to introduce them to the methods and theories of material and visual analysis, as well as the practices of critical writing and reading. Students who pursue the thesis option have the opportunity to specialize at that stage.

### Admission Criteria

Admission to the department on the graduate level is granted yearly to a small number of candidates who hold recognized BA or MA degrees in art history, classical archaeology, classics, or related fields of the humanities and social sciences. In addition to the 3.0 GPA required by

the Graduate School, the department requires: a GPA of 3.3 in the major field; minimum GRE score (below) and at least three semesters of a single appropriate foreign language (normally German, French or Italian).

Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	4.5
On or After August 1, 2011	300	4.5

## Required Application Materials

All application materials must be submitted directly to the Graduate School through its Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) online application system. Applications will not be considered complete until we receive the following:

- Official transcripts or mark sheets from each university or college you have attended
- GRE scores
- Three letters of recommendation concerning academic qualifications to undertake graduate work
- A short statement of the applicant's professional goals and reasons for applying to do graduate work in art history or archaeology
- A copy of a recent term paper as a sample of the applicant's scholarship and writing
- Curriculum vitae

## Financial Aid from the Program

Incoming students are considered for funding when they apply to the program. Returning students submit applications for continued funding in the spring semester.

## Graduation Requirements

### Course Requirements

The successful completion of the MA requires at least thirty hours of coursework that must include: AR\_H\_A 8110 Introduction to Graduate Study; AR\_H\_A 8120 Theories and Methodologies in Art History and Archaeology; four distribution requirements that cover four broad periods of study: Ancient, Medieval and Renaissance, 1500-1850, and 1850-Present; and AR\_H\_A 8070 Master's Tutorial. If students are invited to pursue the thesis option, they must enroll in AR\_H\_A 8080 Readings for MA Thesis in Art History and Archaeology and AR\_H\_A 8090 Master's Thesis Research and Thesis in place of AR\_H\_A 8070. Courses for an interdisciplinary minor field will be in addition to these minimums.

### Language Requirements

All students must demonstrate reading knowledge of one foreign language, usually German or a Romance language. Departmental language exams are offered in the fall semester of each year, although students can request an examination in the spring semester. Language requirements may be satisfied also by achieving a grade of B or better in a course approved by the Director of Graduate Studies. The department expects that the modern language requirement will be met by the end of the third semester for use in advanced coursework as well as thesis research and writing. In addition to the modern language, students in Classical Archaeology also must have reading knowledge of either

Greek or Latin. Students who pursue the thesis option must have reading knowledge of two modern languages: German and a Romance language.

## Master's Essay

To complete the degree, students must complete a scholarly essay under the guidance of a faculty adviser. It will most likely be a revision of a research paper from a graduate course taken in the Department of Art History and Archaeology.

## Master's Essay Oral Examination

In consultation with the faculty adviser, students will select two additional members of the department faculty to read the essay. Students will discuss their essays in a meeting chaired by their adviser.

## Master's Thesis Option

Graduate students who intend to pursue doctoral work should complete the thesis option. This decision is made during the student's second or third semester in residence in consultation with the Director of Graduate Studies and three faculty members in the student's area of interest.

## Master's Thesis Committee

The master's thesis committee consists of at least three people: the student's thesis adviser, a second member from within the department, and a third member from outside the department. The student should invite the latter two in consultation with his or her thesis adviser.

The committee must approve the thesis topic in the semester before the student plans to defend the thesis; often, this is accomplished during an interview for candidacy.

## Master's Thesis

The master's thesis enables graduate students to engage in independent and thorough research in a specific area of study. While the thesis need not be an original contribution, neither can it be an uncritical compilation of published facts. A successful thesis will demonstrate the student's ability to use bibliography in the field; effectively utilize research tools and techniques; synthesize a variety of types of sources; and sustain an argument.

## Master's Thesis Defense

The defense of the master's thesis is an oral examination, chaired by the student's adviser, which focuses specifically on the MA thesis. The student should submit a complete draft of the thesis to the adviser at least two months before the intended defense date and a final draft, approved by the adviser, to the entire committee 30 days before the defense. Any changes recommended by the committee during the defense must be made before the finished thesis can be submitted to the Graduate School.

## More Information

Further guidelines are included in the department's graduate programs brochure or on the website.

# PhD in Art History and Archaeology

## Admission Contact Information

Keith Eggener (EggenerK@missouri.edu)  
109 Pickard Hall  
Columbia, MO 65211  
573-882-6711

## About the PhD

In the Doctoral Program, students deepen their exploration of art history or classical archaeology and demonstrate their ability to carry out original scholarship.

The department advises doctoral students in the following areas of study:

- Greek Art and Archaeology
- Roman and Late Antique Art and Archaeology
- Early Medieval Art and Archaeology
- Late Medieval Art
- Renaissance and Baroque Art
- 18 th Century Art
- 19 th Century Art
- 20-21 st Century Art
- American Art
- Architectural History

## Admission Criteria

The department accepts as candidates for the PhD students who have earned an MA or its equivalent in art history or classical archaeology, either from the University of Missouri or from an institution recognized by the university. An MA thesis is a prerequisite for the PhD in both art history and classical archaeology. The Doctoral Program Committee (see below) determines the acceptability of work completed elsewhere.

Students completing an M.A. degree in the Department of Art History and Archaeology at the University of Missouri-Columbia who want to continue for the Ph.D. must be accepted for advising by a faculty member who is a member of the doctoral faculty. Such students should submit a statement of purpose and a current CV to the department by the January 18 deadline. After they are accepted for advising, they need to submit a "Change of Program, Degree, Emphasis or Advisor Form" to the Graduate School.

## Required Application Materials

All application materials must be submitted directly to the Graduate School through its Apply Yourself (<https://app.applyyourself.com/> AYApplicantLogin/fl\_ApplicantLogin.asp?id=umc-grad) online application system. Applications will not be considered complete until we receive the following:

- Official transcripts or mark sheets from each university or college you have attended
- GRE scores
- Three letters of recommendation concerning academic qualifications to undertake graduate work

- A short statement of the applicant's professional goals and reasons for applying to do graduate work in art history or archaeology
- A copy of a recent term paper as a sample of the applicant's scholarship and writing, and
- Curriculum vitae

## Financial Aid from the Program

Incoming students are considered for funding when they apply to the program. Returning students submit applications for continued funding in the spring semester.

## Graduation Requirements

### Coursework

The Graduate School requires a minimum of 72 hours for the PhD. At least 42 of those hours must be completed after the receipt of MA. Up to 30 hours from a previous institution can count toward the total of 72 hours. Most students will take more than the minimum number of courses and requirements

The 42 hours must include:

- At least one course from the following four areas—Ancient, Medieval and Renaissance, 1500-1850, and 1850-Present—unless students have taken an equivalent at the MA level.
- 27 hours of courses in the major areas. At least 12 of the 27 hours must be seminars at the 8000 level.
- 15 hours of coursework in the minor areas. At least 6 of the 15 hours must be taken at the 8000-level

The student's program of study is determined in consultation with the Doctoral Program Committee. The Doctoral Program Committee is constituted in October during the first year of study. It consists of at least four people: the student's adviser; two additional scholars from within the department; and an outside committee member. The committee:

1. Reviews the student's MA thesis and determines its equivalency;
2. Accepts any transfer of credit from previous institutions;
3. Approves the plan of study;
4. Determines the major and minor areas as well as the scheduling of the comprehensive exams;
5. Approves the subject of the student's dissertation;
6. Examines the student's dissertation.

## Languages

All students must demonstrate reading knowledge of two foreign languages, usually German and a Romance language relevant to their area. Departmental language exams are offered in the fall semester of each year, although students can request an examination in the spring semester. Language requirements may be satisfied also by achieving a grade of B or better in a course approved by the Director of Graduate Studies.

In addition to the modern languages, students in classical archaeology must demonstrate reading knowledge of both Greek and Latin. This requirement may be satisfied by passing with a grade of B or better in a course numbered 7500 or higher in both Greek and Latin and by taking a second course at this level (7500 or higher) in the language more closely related to the major field of study. Equivalent courses taken at other institutions must be approved by the Director of Graduate Studies.

## Comprehensive Examination

The comprehensive examination in the major and minor areas of art history and archaeology, determined by the student and the doctoral program committee, consists of both written and oral examinations.

## Dissertation

The dissertation is expected to be an original, scholarly contribution to the discipline. The topic must be approved by the adviser and the Doctoral Program Committee. A dissertation proposal should be filed with members of the committee within two months of passing the comprehensive exams. A proposal for a dissertation fellowship will satisfy this requirement.

Individual chapters are generally submitted to the adviser as they are written. Other members of the Doctoral Program Committee may also criticize them in draft form. A complete, revised draft of the dissertation must be approved by the adviser at least two months before the defense. Students should distribute the final draft to each member of the committee at least one month before the defense.

Students maintain continuous enrollment by registering for 9080 or 9090 and by submitting a progress report to the Graduate Student Progress System and their adviser each term. Dissertation advising is not normally available during the summer unless previous arrangements have been made.

Further guidelines, including available areas of doctoral study, are included in the department's website.

## Dissertation Defense

The final examination will be in the form of an oral defense of the dissertation. It must take place on or before the penultimate Friday of classes. Any changes recommended by the committee during the defense must be made and approved before the finished thesis can be submitted to the Graduate School. Students are responsible for ensuring they meet the deadlines and guidelines established by the Graduate School for dissertation submission and graduation.

## Biological Sciences

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J. Walker, Director  
College of Arts and Science  
105 Tucker Hall  
(573) 882-6659

The Division of Biological Sciences offers both a Bachelor of Arts and a Bachelor of Science with a major in Biological Sciences, in addition to a minor in biological sciences for students majoring in other departments. The department also offers MA and PhD degrees in Biological Sciences.

### Faculty

**Curators Professor** J. A. Birchler\*\*, H. C. Gerhardt#, R. Semlitsch\*\*, G. P. Smith#, F. S. Vom Saal\*\*

**Professor** S. Alexander\*\*, A. Chandrasekhar\*\*, R. B. Cocroft\*\*, J. R. Faaborg\*\*, C. Galen\*\*, P. H. S. Jen\*\*, M. D. Kirk\*\*, E. Liscum III\*\*, A. D. McClellan\*\*, K. J. Newton\*\*, T. E. Phillips\*\*, J. Schul\*\* D. R. Setzer\*, J. C. Walker\*\*

**Associate Professor** D. Braun\*\*, D. Cornelison\*\*, J. D. David\*, L. Eggert\*\*, M. Garcia\*\*, M. W. Golomb\*\*, T. P. Holtsford\*, J. Maruniak\*, P. McSteen\*\*, J. C. Pires\*\*, D. Schulz\*\*, P. Shiu\*\*, G. F. Summers\*, C. Tan\*\*, T. D. Zars\*\*

**Assistant Professor** P. Brown\*\*, R. Holdo\*\*, L. Milescu\*\*, M. Milescu\*\*, S. Waters\*\*

**Adjunct Associate Professor** H. Alexander\*\*

**Adjunct Assistant Professor** J. Taylor, J. Weaver\*

**Teaching Associate Professor** S. L. Bush\*, R. D. Hurst, B. Stone

**Teaching Assistant Professor** D. Gayou

**Distinguished Teaching-Professor Emeritus** J. E. Carrel\*\*

**Professor Emeritus** B. G. Cumbie, A. Eisenstark, D. Mertz, C. D. Miles

**Associate Professor Emeritus** L. Chapman, D. L. Worcester\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 151)
- BA in Biological Sciences (p. 152)
- BS in Biological Sciences (p. 153)
- Minor in Biological Sciences (p. 153)

#### Undergraduate Advising Center

3 Tucker Hall  
(573) 882-4068  
bioadvising@missouri.edu

Carol Martin  
martinc@missouri.edu

Nicholas Holladay  
holladayj@missouri.edu

Lisa Scheese  
scheesel@missouri.edu

### Departmental Honors

The department strongly encourages participation in departmental honors. The heart of the honors program is a year-long experience in laboratory, field, or theoretical work in any area of biology. Students work directly with outstanding faculty mentors from the Division of Biological Sciences or other life science units on campus.

Students may earn degrees with honors by completing BIO\_SC 4950H and BIO\_SC 4952H (6 credits) and preparing a manuscript suitable for publication in a journal or the abstract of an oral or poster presentation at an on-campus symposium or at a regional or national meeting of a professional society. Students should meet with the honors program director to arrange their research experience. The honors program requires sophomore standing or higher and a GPA of 3.3. Students with a GPA between 3.0 and 3.29 may petition the director of the honors program for admission. Students must however graduate with a GPA of 3.3 to receive departmental honors. The honors program director is Professor David Setzer, 410 Tucker, 882-6821, setzerd@missouri.edu.

### Graduate

College of Arts and Science  
218 Tucker Hall  
1-800-553-5698  
573-882-1847  
<http://biology.missouri.edu>

**Co-Director of Graduate Studies:** Raymond Semlitsch

**Co-Director of Graduate Studies:** Steve Alexander

- MA in Biological Sciences (p. 154)
- PhD in Biological Sciences

### About Biological Sciences

The Division of Biological Sciences offers a unique integration of world-class research, award-winning graduate and undergraduate training, and outstanding community outreach. Our research mission includes the acquisition of new knowledge through basic research, and coordinated translational research to improve human health, our food supply, and our environment. Graduate training programs emphasize the excitement of discovery and the development of individual creativity and critical reasoning skills, with graduate mentors who are experts at the frontiers of their field. Because science exposure in the pre-college years is critical to the development of both scientists and informed citizens, we also offer special outreach programs for secondary school science teachers, students and citizens in Missouri.

The Division of Biological Sciences actively recruits outstanding graduate students from both national and international pools. Selected candidates are interviewed. The best are admitted to the division for graduate study. Even more important than the quantitative Grade Point Average and GRE scores, we are interested in evidence of critical qualitative characteristics including: undergraduate research experiences and presentation of research results; ability to face and overcome obstacles; exceptional motivation, work ethic, intellectual vitality, initiative, creativity, critical thinking ability and leadership ability.

### Areas of Study

The division offers primarily PhD degrees. General areas of research emphasis within the division include evolutionary biology, ecology and behavior; genetic, cellular, molecular and developmental biology;

neurobiology and behavior; and plant sciences. Within these general areas, students may devise more specific graduate programs in, for example, plant genetics, invertebrate chemical communication or neurophysiology.

## Interdisciplinary Research

Several students are currently involved in interdepartmental programs in neurosciences, genetics, plant biochemistry and physiology, cellular and molecular biology, the Conservation Biology Program, microbiology and physiology. In addition, the presence on this campus of a School of Medicine, College of Agriculture, Food and Natural Resources and College of Veterinary Medicine provides opportunities for direct interaction with a variety of established research scientists. Faculty in the division also participate in the Genetics Area Program, the Pathobiology Area Program, the Molecular Biology Program, the Interdisciplinary Program in Plant Biochemistry and Physiology, the Interdisciplinary Neuroscience Program and the Conservation Biology Program.

All entering graduate students should have a broad background in biology and should have completed courses in mathematics through integral calculus, chemistry through organic chemistry and a year of physics. Exceptions may be made for individual students. Outstanding students with undergraduate degrees in areas other than biology (such as chemistry, physics, engineering, mathematics or psychology) are encouraged to apply with the understanding that subject matter in biology will be addressed in the first year of graduate study.

## Research Facilities and Resources

Divisional faculty have ready access to the campus computing network and microcomputers in their laboratories. Beyond the specialized equipment in each faculty research laboratory, departmental and campus equipment and facilities available to graduate students include:

- Molecular and cellular biology core facilities, including DNA (with Next Generation Sequencing), Electron Microscopy, Cell and Immunobiology, Informatics, Nuclear Magnetic Resonance, Molecular Cytology, Proteomics, Structural Biology, and Transgenic Animal;
- a 250,000-specimen herbarium;
- a new 15,000-square-foot greenhouse complex;
- animal-care facilities suitable for mice, bats, rats, rabbits and amphibians;
- a 14-acre botany preserve on the campus and a 146-acre prairie research station;
- 24 walk-in plant growth chambers with regulated light, temperature and humidity controls;
- cell and tissue culture facilities;
- growth chambers;
- scanning spectrophotometers and kinetic fluorimeters;
- ultracentrifuges and scintillation counters;
- HPLC facilities;
- sound isolation acoustic chambers;
- neurophysiological recorders, oscilloscopes and amplifiers; and,
- microneurosurgery facilities and equipment.

## Funding

Financial support is available through research training grants, fellowships, scholarships, graduate research assistantships, and graduate teaching assistantships.

## Undergraduate

### Department Level Requirements - Biological Sciences

#### Requirements - Biological Sciences

Requirements for the BA and BS degrees with a major in Biological Sciences include course work in biology and ancillary science departments (chemistry, physics and math). The BS degree program requires more extensive course work, with additional studies in biology and the ancillary sciences. The BA degree program is more flexible and has fewer required courses to accommodate students with dual degrees or minors in related departments. Both degree programs can be used to prepare for graduate study or professional school. Students must also complete college and university graduation requirements, including university general education requirements.

All courses in the major (including ancillary sciences) must be completed with a grade of C- or higher with a cumulative GPA of 2.0 or higher. At least 12 hours of biology coursework must be taken in residence at MU.

#### Major Core Requirements Biology

BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
BIO_SC 2200	General Genetics	4
BIO_SC 2300	Introduction to Cell Biology	4
Evolutionary Biology (select from):		3
BIO_SC 3400	Evolution and Ecology	
BIO_SC 4600	Evolution	
Biological Diversity (select from):		3-5
BIO_SC 2600	Ornithology	
BIO_SC 2700	Ichthyology	
MICROB 3200	Medical Microbiology and Immunology	
BIO_SC 3210	Plant Systematics	
BIO_SC 3260	Invertebrate Zoology	
BIO_SC 3360	Herpetology	
BIO_SC 3510	Biology of Fungi	
BIO_SC 3660	Mammalogy	
BIO_SC 3710	Introductory Entomology	
& BIO_SC 3715	and Insect Diversity	
<b>Capstone course (select one) (complete in last 45 hours):</b>		3-5
BIO_SC 4950	Undergraduate Research in Biology	
& BIO_SC 4952	and Undergraduate Research in Biology	
BIO_SC 4950H	Honors Research in Biology	
& BIO_SC 4952H	and Honors Research in Biology	
BIO_SC 4976	Molecular Biology	
BIO_SC 4978	Cancer Biology	
BIO_SC 4982	Human Inherited Diseases	
BIO_SC 4983	Molecular Ecology	
BIO_SC 4984	Mammalian Reproductive Biology	

BIO_SC 4986	Neurology of Motor Systems
BIO_SC 4988	Nerve Cells and Behavior
BIO_SC 4990	Vertebrate Histology and Microscopic Anatomy
BIO_SC 4994	Senior Seminar

### Electives

All biology majors must take additional biology courses to total at least 29 credits for the BA degree or 33 credits for the BS degree.

Elective credits must be in formal courses numbered above 2000 and must include at least one 3000- or 4000-level laboratory course, one 4000-level course, and one WI course at the 3000 or 4000 level in a natural science. BIO\_SC 2010, BIO\_SC 2060, and BIO\_SC 2100 may not be used to satisfy this requirement. MICROB 3200 may not be used to satisfy the laboratory course requirement.

Independent reading, service learning, internships, problems and seminar courses do not apply.

Students completing research courses BIO\_SC 4950, BIO\_SC 4950H, BIO\_SC 4952, or BIO\_SC 4952H for 6 credits may apply 3 credits toward fulfillment of biology elective hours for the BA or BS degree.

Students may repeat research courses for a total of 12 hours. Any credit remaining after 3 hours are used as a capstone or an elective in biology will be applied toward total hours to graduate. A maximum of 12 credit hours from the following courses (BIO\_SC 2940, BIO\_SC 2960, BIO\_SC 2965H, BIO\_SC 4085, BIO\_SC 4950, BIO\_SC 4950H, BIO\_SC 4952 and BIO\_SC 4952H) can be counted toward graduation.

BIOCHM 4270 and BIOCHM 4272 may apply toward fulfillment of biology elective hours for the BA or BS degree.

## BA in Biological Sciences

### Major Program Requirements

Department Level Requirements (p. 151) must be completed in addition to all university requirements (p. 17), including general education (p. 18), and the degree requirements below.

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
One course in Physics, Geology or Astronomy		4-5
Select one of the following:		3-5
MATH 1400	Calculus for Social and Life Sciences I	
MATH 1500	Analytic Geometry and Calculus I	
STAT 1400	Elementary Statistics for Life Sciences	
CMP_SC 1040	Introduction to Problem Solving and Programming	
Total Credits		21-24

All courses in the major (including ancillary sciences) must be completed with a grade of C- or higher with a cumulative GPA of 2.0 or higher. At least 12 hours of biology coursework must be taken in residence at MU.

## Semester Plan

NOTE: These plans are intended only as general guides. Courses outside Biology, Chemistry, MATH 1100, and ENGLISH 1000 are provided only for illustrative purposes. Advanced credit or exemption from the Foreign Language requirement and/or advanced credit in non-science courses, along with the interests of each individual student will determine a final combination of courses in each semester that is unique for each student. Note also that the sample schedules in Semester 5 and beyond are left incomplete on purpose because each schedule should be highly individualized at that point. Students who are pursuing the BA will not need to complete CHEM 2130.

### Plan 1

#### A student that is exempt from MATH 1100

First Year			
Fall	Credits	Spring	Credits
CHEM 1320	4	CHEM 1330	4
ENGLISH 1000	3	BIO_SC 1500	5
Behavioral Science Course	3	Humanities Course	3
Social Science Course (MO State Law)	3	Social Science Course	3
Elective	1-2		
	14-15		15
Second Year			
Fall	Credits	Spring	Credits
BIO_SC 2200	4	CHEM 2110	3
CHEM 2100	3	CHEM 2130	2
STAT 1400	3	BIO_SC 2300	4
Humanities Course (2000-level)	3	MATH 1400 *	3
Elective	1-2	Behavioral Sciences Course (2000-level)	3
	14-15		15
Total Credits: 58-60			

\* See Grad Plan for Mathematical Science Options

### Plan 2

#### A student that needs MATH 1100

First Year			
Fall	Credits	Spring	Credits
BIO_SC 1500	3-5	CHEM 1320	4
MATH 1100	3	ENGLISH 1000	3
Behavioral Sciences Course	3	Humanities Course	3
Social Science Course (MO State Law)	3	Social Science Course	3
Elective	1	Elective	1-2
	13-15		14-15
Second Year			
Fall	Credits	Spring	Credits
CHEM 1330	4	CHEM 2100	3
BIO_SC 2200	4	BIO_SC 2300	4
Humanities Course (2000-level, WI)	3	Humanities Course	3



Social Science Course (2000-level)	3	Behavioral Sciences Course (2000-level)	3
		Humanities Course (2000-level)	3
	14		16
Total Credits: 57-60			

## BS in Biological Sciences

### Major Program Requirements

Department Level Requirements (p. 151) must be completed in addition to all university requirements, including general education (p. 18), and the degree requirements below.

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
One Year of General Physics with Laboratory		8-10
One of two courses in calculus, select one of the following:		5-6
MATH 1500	Analytic Geometry and Calculus I	
MATH 1400	Calculus for Social and Life Sciences I	
& MATH 2100	and Calculus for Social and Life Sciences II	
STAT 1400	Elementary Statistics for Life Sciences	
& CMP_SC	and Introduction to Problem Solving and	
1040	Programming	

Total Credits 29-32

All courses in the major (including ancillary sciences) must be completed with a grade of C- or higher with a cumulative GPA of 2.0 or higher. At least 12 hours of biology coursework must be taken in residence at MU.

### Semester Plan

NOTE: These plans are intended only as general guides. Courses outside Biology and Chemistry are provided only for illustrative purposes. Advanced credit or exemption from the Foreign Language requirement and/or advanced credit in non-science courses, along with the interests of each individual student will determine a final combination of courses in each semester that is unique for each student. Note also that the sample schedules in Semester 5 and beyond are left incomplete on purpose because each schedule should be highly individualized at that point.

#### Plan 1

##### A student that is exempt from MATH 1100

First Year			
Fall	Credits	Spring	Credits
CHEM 1320	4	CHEM 1330	4
ENGLISH 1000	3	BIO_SC 1500	5
Behavioral Sciences Course	3	Humanities Course	3
Social Sciences Course (MO State Law)	3	Social Science Course	3
Elective	1-2		
	14-15		15

Second Year			
Fall	Credits	Spring	Credits
CHEM 2100	3	CHEM 2110	3
BIO_SC 2200	4	CHEM 2130	2
STAT 1400	3	BIO_SC 2300	4
Humanities Course (2000-level)	3	MATH 1400 *See Grad Plan for Mathematical Sciences Option	3
Elective	1-2	Behavioral Sciences Course (2000-level)	3
	14-15		15
Total Credits: 58-60			

#### Plan 2

##### A student that needs MATH 1100

First Year			
Fall	Credits	Spring	Credits
BIO_SC 1500	5	CHEM 1320	4
MATH 1100	3	ENGLISH 1000	3
Behavioral Sciences Course	3	Humanities Course	3
Social Sciences Course (MO State Law)	3	Social Sciences Course	3
Elective	1	Elective	1-2
	15		14-15
Second Year			
Fall	Credits	Spring	Credits
CHEM 1330	4	CHEM 2100	3
BIO_SC 2200	4	BIO_SC 2300	4
Humanities Course (2000-level, WI)	3	Humanities Course	3
Social Sciences Course	3	Behavioral Sciences Course	3
		Humanities Course (2000-level)	3
	14		16
Total Credits: 59-60			

## Minor in Biological Sciences

### Minor Core Requirements

BIO_SC 1200	General Botany with Laboratory	5
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	

### Additional Biological Sciences

Select 10 credits from at least two of the following areas: 10

#### Genetics

BIO\_SC 2200 General Genetics

#### Cell Biology

BIO\_SC 2300 Introduction to Cell Biology

#### Evolutionary Biology

BIO\_SC 3400 Evolution and Ecology

BIO\_SC 4600 Evolution

#### Biological Diversity

BIO\_SC 2600 Ornithology

BIO\_SC 2700 Ichthyology

BIO\_SC 3210 Plant Systematics

BIO_SC 3260	Invertebrate Zoology
BIO_SC 3360	Herpetology
BIO_SC 3510	Biology of Fungi
BIO_SC 3660	Mammalogy
BIO_SC 3710 & BIO_SC 3715	Introductory Entomology and Insect Diversity
MICROB 3200	Medical Microbiology and Immunology
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Total Credits	15

At least one of the additional courses, selected from the list above, must include a laboratory. Problems, service learning, internships, readings and research (i.e., BIO\_SC 2010, BIO\_SC 2600, BIO\_SC 2100, BIO\_SC 2940, BIO\_SC 2960, BIO\_SC 2965H, BIO\_SC 4085, BIO\_SC 4950, , BIO\_SC 4952, BIO\_SC 4952H, and BIO\_SC 4960) may not be used to fulfill requirements for the minor. MICROB 3200 may not be used to satisfy the laboratory course requirement.

All courses in the minor must have a grade of C- or higher with a cumulative GPA of 2.0 or higher in the minor. At least nine of the 15 credit hours in the minor must be taken in residence at MU.

## Graduate

### MA in Biological Sciences

#### Areas of Study

The division offers primarily the PhD degree (p. 154).

### PhD in Biological Sciences

#### Admission Contact Information

College of Arts and Science  
218 Tucker Hall  
Columbia, MO 65211  
800-553-5698  
573-882-1847

The Division of Biological Sciences actively recruits outstanding graduate students from both national and international pools. Selected candidates are interviewed. The best are admitted to the division for graduate study. Even more important than the quantitative Grade Point Average and GRE scores, we are interested in evidence of critical qualitative characteristics including: undergraduate research experiences and presentation of research results; ability to face and overcome obstacles; exceptional motivation, work ethic, intellectual vitality, initiative, creativity, critical thinking ability and leadership ability.

#### Eligibility

All entering graduate students should have a broad background in biology and should have completed courses in mathematics through integral calculus, chemistry through organic chemistry and a year of physics. Exceptions may be made for individual students. Outstanding students with undergraduate degrees in areas other than biology (such as chemistry, physics, engineering, mathematics or psychology) are encouraged to apply with the understanding that subject matter in biology will be addressed in the first year of graduate study.

### Admission Criteria

- Fall deadline: December 15
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600
• Minimum GRE scores:	
When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1200
On or after August 1, 2011	300

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Biological Sciences Program:*

- Division of Biological Sciences application form
- GRE test scores
- Official Transcripts
- 3 Reference letters
- Personal Statement
- Statement of previous research or scholarly experience
- Résumé

## Chemistry

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J. Atwood, Chair  
College of Arts and Science  
125 Chemistry Building  
(573) 882-8374  
chemistry@missouri.edu

The Department of Chemistry offers four undergraduate degree tracks, three leading to a Bachelor of Science and one leading to a Bachelor of Arts. A minor in chemistry and a Bachelor of Science degree with departmental honors also are offered.

At the graduate level, the department offers MS and PhD degrees in Chemistry.

### Faculty

**Curators Professor** J. L. Atwood\*\*

**Curators Teaching Professor** J. E. Adams\*\*

**Rabjohn Professor** M. Harmata\*\*

**Schlundt Professor** K. S. Gates\*\*

**Professor** R. E. Glaser\*\*, M. F. Hawthorne\*\*, S. S. Jurisson\*\*, J. D. Robertson\*\*, P. R. Sharp\*\*, J. J. Tanner\*\*, D. L. Thompson\*\*

**Associate Professor** L. J. Beamer\*\*, C. A. Deakyne\*\*, T. E. Glass\*\*, C. M. Greenlief\*\*, T. J. Hoffman\*\*, S. W. Keller\*, S. Z. Lever\*\*, T. D. Sewell\*\*

**Assistant Professor** G. A. Baker\*\*, J. W. Cooley\*\*, R. D. JiJi\*\*, M. Lee\*\*, J. R. Walensky\*\*

**Assistant Teaching Professor** B. C. Ganley

**Instructor** L. P. Silverman

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 156)
- BA in Chemistry (p. 156)
- BS in Chemistry (p. 157)
- Minor in Chemistry (p. 158)

### Graduate

College of Arts and Science  
125 Chemistry Building  
573-882-8374  
<http://chemistry.missouri.edu/>

**Director of Graduate Studies:** Timothy Glass

- MS in Chemistry (p. 158)
- PhD in Chemistry (p. 158)

The Department of Chemistry offers graduate degrees in all areas of modern chemistry, including analytical, biological, computational, inorganic, organic, physical and radiochemistry.

### Resources and Facilities

The department has well-equipped laboratories that contain state-of-the-art instrumentation and computing facilities for research. Major instrumentation includes NMR, X-ray diffraction and mass spectrometry centers, as well as a nuclear/radiochemistry lab. Other campus facilities widely used by the department include a central instrument shop, electronics shop, campus computing center and a 10-megawatt nuclear reactor. The latter provides a high neutron flux for radioisotope production, neutron activation analysis and neutron diffraction studies.

### Internal Funding

Fellowships and teaching and research assistantships are available for highly qualified applicants. Application forms are available on the department's website and should be submitted by February 1.

### Graduate Degree Requirements

Students are strongly encouraged to visit the Department of Chemistry site (<http://chemistry.missouri.edu>) for the most up-to-date information.

### Entrance Criteria

An applicant for graduate work in chemistry should have either a Bachelor of Arts or Bachelor of Science degree in chemistry, essentially equivalent to those awarded at MU, with at least a B average or a score at the 70th percentile on the GRE general test.

### Examinations

All new graduate students in chemistry are required to take Departmental placement/qualifying examinations in all core areas (analytical, inorganic, organic and physical) prior to registration. Students must qualify in two areas. A student who performs well on an exam, as determined by the department's Graduate Program Committee, will be considered to have qualified in that area. Students who do not qualify in particular areas, via the placement examinations, must pass appropriate advanced-level courses in those areas to qualify. An A or B grade is required in these courses for qualification.

### Research, Advising, and the Committee

Affiliation with research adviser must be made by the end of the first semester through a formal process that is part of CHEM 7087. Student progress in the degree program is evaluated annually in May, using the Graduate Student Progress System through the Graduate School. In addition, the student's Graduate Program Committee meets with the student and their research adviser after their first summer of research to review degree progress. At this time the student will have submitted a formal Research Progress Report to their committee for consideration. All students are expected to attend Departmental Colloquium and Organic/DyNAMITE seminars.

### Undergraduate

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## Department Level Requirements - Chemistry

### Requirements - BA or BS students

Students should consult with a chemistry advisor to schedule science and mathematics requirements in the appropriate order. Note that for a number of chemistry courses there is a prerequisite of a grade of C or better in a previous course. Please see Professor Steven W. Keller (Associate Chair for Undergraduate Studies) for assignment of an advisor.

Students also must complete all applicable College of Arts and Sciences and University graduation requirements (p. 126), including University general education (p. 18). Note that students pursuing a BS degree with a major in Chemistry may opt to satisfy the foreign language requirement through alternative course work consisting of no fewer than 12 credits numbered 2000 or above.

#### Major Core Requirements

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
CHEM 2140	Organic Laboratory II	2
CHEM 2400	Fundamentals of Inorganic Chemistry with Lab	3
CHEM 3200	Quantitative Methods of Analysis with Lab	4
CHEM 3700	Undergraduate Seminar in Chemistry	3
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
Total Credits		38

### Degree Tracks

Beyond the major core requirements, each student must select a degree track. There is one track for students pursuing a BA degree and three for those pursuing a BS. The BA degree is designed to meet the needs of students who wish to gain a strong chemistry background but who may have goals other than employment as a chemist or graduate work in chemistry. The American Chemical Society certification track is recommended for BS students who desire professional employment as chemists or who plan to pursue graduate education in chemistry. A medicinal chemistry track is available to BS students who plan careers in the health professions or in pharmaceutical, clinical or medicinal chemistry. The third BS track, leading to simultaneous completion of a BS in Chemistry and a BS in Education, is appropriate for those students who wish to teach chemistry in secondary schools. More information about this third degree track is available from Professor Steven W. Keller, Associate Chair for Undergraduate Studies.

Note: "Track" designations do not appear on transcripts or diplomas.

### Double Majors

No specific programs (other than the dual degree program with the College of Education noted above) are offered, although it is possible to combine a chemistry major (BS or BA) with a variety of other majors, including biological sciences, mathematics and physics.

## Departmental Honors

A BS with Honors in Chemistry is available to honors-eligible BS students who complete CHEM 4990H and CHEM 4991H as well as all of the requirements for the ACS Certification Track. (These courses replace CHEM 4950) Please see Professor Carol Deakyne, the Chemistry Honors Coordinator, for more specific details about the Honors in Chemistry program.

## BA in Chemistry

### Major Program Requirements

Department Level Requirements (p. 156) must be completed in addition to all university requirements, including general education (p. 18), and the degree requirements below.

CHEM 3300	Fundamentals of Physical Chemistry	3
PHYSICS 1210	College Physics I	4
or PHYSICS 2750	University Physics I	
PHYSICS 1220	College Physics II	4
or PHYSICS 2760	University Physics II	
Collateral Courses		12
Additional course work at the 2000-level or higher outside of chemistry. For example: biological sciences, mathematics, biochemistry or business		
Total Credits		23

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CHEM 1320*	4	CHEM 1330*	4
MATH 1500*	5	MATH 1700	5
American History/Government*	3	English Composition*	3
General Education/Elective*	3-5	General Education/Elective*	3-5
	15-17		15-17
Second Year			
Fall	Credits	Spring	Credits
CHEM 2100	3	CHEM 2110	3
CHEM 2400	3	CHEM 2130	2
PHYSICS 1210	4	CHEM 3700	3
General Education/Elective*	3	PHYSICS 1220	4
General Education/Elective*	3	General Education/Elective*	3
	16		15
Third Year			
Fall	Credits	Spring	Credits
CHEM 3200	4	CHEM 2140	2
Collateral Area Course	3	Collateral Area Course	3

Foreign Language	5	Foreign Language	5
General Education/Elective *	3	General Education/Elective *	3
		General Education/Elective *	3
	15		16
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 3330	3	Collateral Area Course	3
Collateral Area Course	3	General Education/Elective *	3
Foreign Language	3	General Education/Elective *	3
General Education/Elective *	3	General Education/Elective *	3
General Education/Elective *	3	General Education/Elective *	3
	15		15
Total Credits: 122-126			

\* Courses satisfy certain University general education requirements.

## BS in Chemistry

### Major Program Requirements

Department Level Requirements (p. 156) must be completed in addition to all university requirements, including general education (<https://nextcatalog.missouri.edu/academicdegree/requirements/general-education-requirements/>), and the degree requirements below.

### Chemistry Major with BS Degree American Chemical Society Certification Track

CHEM 3310	Physical Chemistry I	3
CHEM 3330	Physical Chemistry II	3
CHEM 3340	Physical Chemistry Laboratory	3
CHEM 4200	Instrumental Methods of Analysis with Lab	3
CHEM 4400	Inorganic Chemistry	3
CHEM 4950	Senior Research	3
BIOCHM 4270	Biochemistry	3
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
MATH 2300	Calculus III	3
<b>Total Credits</b>		<b>34</b>

### Medicinal Chemistry Track

CHEM 3300	Fundamentals of Physical Chemistry	3
CHEM 3700	Undergraduate Seminar in Chemistry	3
CHEM 4170	Medicinal Chemistry	3
CHEM 4600	Introduction to Radiochemistry with Lab	3
or BIO_SC 4328	Introductory Radiation Biology	
PHYSICS 1210	College Physics I	4
or PHYSICS 2750	University Physics I	
PHYSICS 1220	College Physics II	4
or PHYSICS 2760	University Physics II	
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
BIO_SC 2200	General Genetics	4

BIO_SC 2300	Introduction to Cell Biology	4
BIOCHM 4270	Biochemistry	3
BIOCHM 4272	Biochemistry	3
<b>Total Credits</b>		<b>37-39</b>

### Dual Degree in Chemistry and Education

CHEM 4800	Chemistry Teaching Practicum	3
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### Semester Plans

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

### Sample Eight-Semester Program - Bachelor of Science with a Major in Chemistry (ACS Certification Track)

<b>First Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 1320 *	4	CHEM 1330 *	4
MATH 1500 *	5	MATH 1700	5
American History/Government *	3	English Composition *	3
General Education/Elective *	3-5	General Education/Elective *	3-5
	15-17		15-17
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 2100	3	CHEM 2110	3
CHEM 2400	3	CHEM 2130	2
MATH 2300	3	CHEM 3700	3
PHYSICS 2750	5	PHYSICS 2760	5
		General Education/Elective *	3
	14		16
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 3200	4	CHEM 2140	2
CHEM 3310	3	CHEM 3330	3
Foreign Language (or substitute)	5	CHEM 3340	3
General Education/Elective *	3	Foreign Language (or substitute)	5
		General Education/Elective *	3
	15		16
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 4200	3	CHEM 4400	3
BIOCHM 4270	3	CHEM 4950	3
Foreign Language (or substitute)	3	General Education/Elective *	3
General Education/Elective *	3	General Education/Elective *	3

General Education/Elective *	3	General Education/Elective *	3
	15		15
Total Credits: 121-125			

\* Courses satisfy certain University general education requirements.

## Sample Eight-Semester Program - Bachelor of Science with a Major in Chemistry (Medicinal Chemistry Track)

Check the Undergraduate Catalog for Prerequisites.

First Year			
Fall	Credits	Spring	Credits
CHEM 1320 *	4	CHEM 1330 *	4
MATH 1500 *	5	MATH 1700	5
American History/Government *	3	ENGLISH 1000 *	3
General Education/Elective *	3-5	BIO_SC 1500	5
	15-17		17
Second Year			
Fall	Credits	Spring	Credits
CHEM 2100	3	CHEM 2110	3
CHEM 2400	3	CHEM 2130	2
BIO_SC 2200	4	CHEM 3700	3
General Education/Elective *	3	BIO_SC 2300	4
General Education/Elective *	3	General Education/Elective *	3
	16		15
Third Year			
Fall	Credits	Spring	Credits
CHEM 3200	4	CHEM 2140	2
PHYSICS 1210	4	PHYSICS 1220	4
Foreign Language (or substitute)	5	Foreign Language (or substitute)	5
General Education/Elective *	3	General Education/Elective *	3
	16		14
Fourth Year			
Fall	Credits	Spring	Credits
CHEM 3300	3	CHEM 4170	3
BIOCHM 4270	3	BIOCHM 4272	3
Foreign Language (or substitute)	3	Chemistry Elective (e.g. CHEM 4600)	3
General Education/Elective *	3	General Education/Elective *	3
General Education/Elective *	3	General Education/Elective *	3
	15		15
Total Credits: 123-125			

\* Courses satisfy certain University general education requirements.

## Minor in Chemistry

A minor in chemistry is awarded for the completion of:

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
CHEM 3200	Quantitative Methods of Analysis with Lab	4
Total Credits		20

If a student's major already requires all of these courses, then an additional elective course not included in that major must be included in the chemistry minor. At least 9 hours of this course work must be taken at MU.

On-line application form for the Minor in Chemistry (<http://backup.coas.missouri.edu/UGForms/minor.html>)

## Graduate

### MS in Chemistry

At this time, the Department of Chemistry is not accepting students into the Master of Science program. Please see admission information on our PhD Program (p. 158).

### PhD in Chemistry

### Admission Contact Information

Jerry Brightwell ([gradchem@missouri.edu](mailto:gradchem@missouri.edu))  
 125 Chemistry  
 Columbia, MO 65211  
 573-884-6832

### Admission Criteria

Fall deadline: February 1  
 Spring deadline: October 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	450	600	3.0-4.0
On or After August 1, 2011	150	150	3.0-4.0

### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Chemistry Program (<http://chemistry.missouri.edu/grad/gradprospec.html>):

- Departmental Application (PDF)
- GRE scores
- 3 letters of recommendation

- Transcripts from each college and university you have attended
- Statement of Purpose, which should include a summary of why you are interested in pursuing an advanced chemistry degree, a brief description of your previous research experiences, the specific area of chemistry you are interested in pursuing, and your future career goals and plans in the chemistry field.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Doctoral Degree Requirements

The following is a brief synopsis of the general degree requirements; please see the Department of Chemistry website for complete details:

1. Students must take at least 5 8000-level courses outside their own research concentration.
2. Students must pass 5 written cumulative exams within a specific time frame.
3. Students must present at least one departmental seminar.
4. Students are required to complete a comprehensive exam, which includes written and oral elements, within a specific time frame.
5. Students must submit and defend a dissertation describing the results of successful and original research in one of the branches of chemistry.

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## Classics

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D. Trout, Chair  
College of Arts and Science  
405 Strickland Hall  
(573) 882-0679  
strodmand@missouri.edu

The Classical Studies Department offers courses in the life, languages, cultures, and thought of the ancient Greeks and Romans.

The department offers a BA degree with a major in Classics and emphasis areas in Classical Humanities, Greek, Latin, and Classical Languages; MA degrees in Classical Languages and PhD degrees in Classical Studies. Minors are also available.

## Faculty

**Professor** D. M. Hooley\*\*, T. A. Tarkow\*\*  
**Associate Professor** R. D. Marks\*\*, A. Mori\*\*, D. J. Schenker\*\*, D. Trout\*\*, B. P. Wallach\*  
**Assistant Professor** R. F. Foley\*\*  
**Associate Teaching Professor** M. H. Barnes\*  
**Professor Emeritus** C. Saylor\*  
**Visiting Assistant Professor** K. Acton, D. Krasne

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 160)
- BA in Classics (p. 160)
  - with emphasis in Classical Languages (p. 161)
  - with emphasis in Classical Humanities (p. 161)
  - with emphasis in Greek (p. 161)
  - with emphasis in Latin (p. 162)
- Minor in Classics with emphasis in Classical Humanities or Greek or Latin (p. 162)

## Graduate

College of Arts and Science  
405 Strickland Hall  
573-882-0679  
<http://classics.missouri.edu/>

**Director of Graduate Studies:** Debbie Strodman

- MA in Classical Languages (p. 162)
- PhD in Classical Studies (p. 163)

The Department of Classical Studies offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy. The graduate faculty encourages applications from talented and committed students, whose undergraduate careers have given them an appreciation of the rich, many-faceted nature of classical studies and an interest in discovering a

place of their own in it. Solid experience in Latin and Greek is of course desirable, but Missouri's MA program is specifically designed for students whose study in one or both of the languages may have come late and who need help getting up to speed rapidly.

## Career Preparation

Graduate programs in classical studies are designed to prepare students for professional careers as teachers and scholars of classical literature and ancient civilization. Besides acquiring expertise in the traditional classical disciplines, students are encouraged to become familiar with other areas, such as later literatures and cultures, on which the classical tradition has exercised a decided effect.

## Facilities and Resources

Because MU is a contributing member of the American Academy in Rome and the American School of Classical Studies in Athens, the facilities of those organizations are available to graduate students from Missouri. Study in Athens or Rome is often feasible after the completion of a master's degree. On campus, students have at their disposal the resources of Ellis Library, which are excellent in the major fields of Greek and Latin languages and literatures, and in ancillary fields. This collection is supplemented by the department's Walter Miller Collection. The Museum of Art and Archaeology contains many items of interest to classicists.

## Undergraduate

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### Department Level Requirements - Classics

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#### Major with Honors

The undergraduate program can also include 3-6 credits in an honors thesis course (CL\_HUM 4970H or CLASS 4970H). These credits, in addition to major requirements and a 3.5 GPA in all classical studies courses (as well as a 3.3 overall GPA), lead to a BA degree with a major in Classics with Honors.

#### Double Majors

A double major is a good way of integrating two related areas of interest, such as Classics and Archaeology or English and Philosophy. Students looking forward to a career in medicine or the sciences may use a double major (Classics and Biology or Chemistry, for instance) to ensure a thorough background in the humanities to balance their scientific studies. Usually minor or related field requirements for each major are satisfied by major courses in the other department. Consult with departmental advisors about specifics.

## BA in Classics

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### Major Program Requirements

BA major requirements are specified in the four major emphasis areas: Latin, Greek, Classical Languages, and Classical Humanities. These must be met in addition to college and university requirements (p. 126), including University general education (p. 18).



## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in Classics with Emphasis in Classical Humanities

### Major Program Requirements

Below are the degree requirements. These must be met in addition to college and university requirements (p. 126), including University general education (p. 18).

CL HUM Courses at the 1000-2000 levels	6-9
CL HUM Courses at the 3000-level or above	15-18

(Latin or Greek language courses numbered 4300 or above can be used to replace up to two required Classical Humanities courses.)

## Semester Plan

Please note that this is only one of many possible routes to a major and that one may concentrate in Latin, or Greek, Classical Languages, or Classical Humanities. For guidance on how to approach other major concentrations, please see the Director for Undergraduate Studies in the Classics Department.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	ENGLISH 1000	3
Social Science Course (MO State Law)	3	CL HUM 1000-2999	3
CL HUM 1000-2999	3	Biological/Physical/Math Science Course with lab	5
LATIN 1100 or GREEK 1100	5	LATIN 1200 or GREEK 1200	5
	14		16
Second Year			
Fall	Credits	Spring	Credits
LATIN 2000 or GREEK 2000	3	LATIN 4300 or GREEK 4300 (OR CL HUM 4000+)	3
Behavioral Science Course	3	Minor	3
Humanities Course	3	Humanities Course (2000-level)	3
Social Science Course (2000-level)	3	Math Reasoning Proficiency Elective Course	3
Minor	3	Behavioral Science Course	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
Humanities Course (WI)	3	Humanities Course (2000-level)	3
Biological/Physical/Math Science Course	4	Minor	3
LATIN/GREEK 4300+ OR CL HUM 3000+	3	CL HUM 3000+ (WI)	3
CL HUM 3000+	3	Elective Course	3

Elective Course	3	Elective Course	3
	16		15
Fourth Year			
Fall	Credits	Spring	Credits
Minor	3	Social Science Course	3
CL HUM Capstone Course	3	CL HUM 3000+	3
CL HUM 3000+	3	CL HUM Minor Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
	15		15
Total Credits: 121			

## BA in Classics with Emphasis in Classical Languages

### Major Program Requirements

Below are the degree requirements. These must be met in addition to college and university requirements (p. 126), including University general education (p. 18).

GREEK 1100 & GREEK 1200 & GREEK 2000	Elementary Ancient Greek I and Elementary Ancient Greek II and Greek Reading	13
or GREEK 1100H & GREEK 1200H & GREEK 2000H	Elementary Ancient Greek I - Honors and Elementary Ancient Greek II - Honors and Greek Reading - Honors	
or LATIN 1100 & LATIN 1200 & LATIN 2000	Elementary Latin I and Elementary Latin II and Latin Reading	
or LATIN 1100H & LATIN 1200H & LATIN 2000H	Honors Elementary Latin and Honors Elementary Latin II and Latin Reading - Honors	
(may be used to help satisfy the foreign language requirement in the College of Arts and Science)		
GREEK 4300	Intermediate Readings	3
LATIN 4300	Latin Poetry	3
or LATIN 4350	Latin Prose	
	4000-level course in Greek or Latin	3
	CL HUM courses at the 2000-level or higher	9

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in Classics with Emphasis in Greek

### Major Program Requirements

Below are the degree requirements. These must be met in addition to college and university requirements (p. 126), including University general education (p. 18).

GREEK 1100	Elementary Ancient Greek I	13
& GREEK 1200	and Elementary Ancient Greek II	
& GREEK 2000	and Greek Reading	
(may be used to help satisfy the foreign language requirement in the College of Arts and Science)		
GREEK 4300	Intermediate Readings	3
GREEK 4350-level or above		9
CL HUM courses at the 2000-level or above		9

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in Classics with Emphasis in Latin

### Major Program Requirements

Department Level Requirements (p. 160)

LATIN 1100	Elementary Latin I	13
& LATIN 1200	and Elementary Latin II	
& LATIN 2000	and Latin Reading	
or LATIN 1100H	Honors Elementary Latin	
& LATIN 1200H	and Honors Elementary Latin II	
& LATIN 2000H	and Latin Reading - Honors	
(may be used to help satisfy the foreign language requirement in the College of Arts and Science)		
LATIN 4300	Latin Poetry	3
LATIN 4350-level or above		9
CL HUM courses at the 2000-level or above		9

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## Minor in Classics

### Minor in Classics with Emphasis in Classical Humanities

Minor requires 15 credit hours

1000 through 2000-level	3-6
3000 through 4000-level	9-12
(3 credits in Greek or Latin language at the 4300-level or above may substitute for equivalent credits)	
<b>Total Credits</b>	<b>15</b>

### Minor in Classics with Emphasis in Greek

Minor requires 15 credit hours.

GREEK 4300	Intermediate Readings	3
One 4350-level or higher Greek course		3
CL_HUM courses at the 2000-level or higher		9
<b>Total Credits</b>		<b>15</b>

## Minor in Classics with Emphasis in Latin

Minor requires 15 credit hours.

LATIN 4300	Latin Poetry	3
One 4350-level or higher Latin course		3
CL_HUM courses at the 2000-level or higher		9
<b>Total Credits</b>		<b>15</b>

## Graduate

### MA in Classical Studies

### Admission Contact Information

Daniel Hooley (hooleyd@missouri.edu)  
 405 Strickland Hall, Columbia, MO 65211  
 573-882-0679

### Admission Criteria

Fall deadline: April 1

**NOTE:** Deadline for teaching assistantship applicants: February 1

Spring deadline: November 1

- Minimum GPA: 3.0 during last 2 years
- Bachelor of arts degree from an accredited college or university
- Reading knowledge of Greek and/or Latin
- GPA of at least 3.0 in Greek and/or Latin courses
- Minimum GRE score: no minimum
- Minimum TOEFL scores

Internet-based test (iBT)	Paper-based test (PBT)
61	500

### Required Application Materials

To the Graduate School

- 3 letters of recommendation
- Statement of interest
- 10-20 pp. writing sample
- Transcripts
- GRE scores

Application materials that cannot be submitted directly to the Graduate School may be sent to the Classical Studies program.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Plan of Study

The minimum course of study is 30 semester hours. Of these, at least 12 hours in Greek, Latin, classics and related fields must be at the 8000/9000 level or above, and at least six hours must be in courses in other departments. At least 21 of the 30 hours must be completed in Greek, Latin or classics in the department. CLASS 7000 is required of all students during their first year of graduate study. Students who wish to have a minor may take 10-12 hours in another department or complete an ancient studies minor.

## Languages

Some command of German and French (or Italian) is helpful from the outset, and MA candidates are required to have demonstrated proficiency in one of the languages by the time that they begin their second year of graduate study. Degree candidates take MA language tests (Latin and/or Greek) in the 2nd or 3rd year of graduate studies.

## Written Works and Oral Examination

A final oral examination is given by a faculty committee selected by the student in consultation with the adviser. This examination will include defense of either the thesis or a compiled portfolio of seminar papers. If the former option is elected, the thesis will account for six credit hours.

## PhD in Classical Studies

### Admission Contact Information

Daniel Hooley (hooleyd@missouri.edu)  
 405 Strickland Hall, Columbia, MO 65211  
 573-882-0679

### Admission Criteria

Fall deadline: April 1, Deadline for teaching assistantship applicants: February 1  
 Spring deadline: November 1

- MA with a major in Greek, Latin or classics, or the equivalent of a minimum of 21 hours of graduate work in the language(s). Reading knowledge of Greek and Latin and a reading knowledge of German and French (or Italian)
- Minimum GRE score: no minimum
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

### Required Application Materials

*To the Graduate School*

- 3 letters of recommendation
- Statement of interest
- 10-20 pp. writing sample
- Transcripts
- GRE scores

Application materials that cannot be submitted directly to the Graduate School may be sent to the Classical Studies program.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Language Requirements

Proficiency in one of the modern foreign languages (i.e., French, German, or Italian) must be demonstrated by the time of registration for the second year of graduate study; proficiency in the second language must be demonstrated by the time of registration for the third year.

## Plan of Study

A minimum of 72 hours of graduate credit is required for the PhD degree. A maximum of 30 hours of this total may consist of hours transferred from the MA degree. At least 21 additional hours must be taken in the department at the graduate level. A minimum of eight hours of dissertation credit is required. At least two courses in related ancient fields, one of which must be in ancient history or classical archaeology, must be taken at the graduate level. Proficiency in Greek and Latin composition must be demonstrated at some point by course work or examination.

## Minors and Areas of Concentration

All candidates must include in their plan of study a minor or area of concentration consisting of at least 12 hours at the graduate level outside the department. Suggested areas include ancient history, classical archaeology, the classical tradition, late antiquity, the oral tradition, rhetoric, or romance languages. A structured minor in ancient studies also is available.

## Examinations

All candidates are required to complete two four-hour qualifying examinations, one in Greek and one in Latin.

## Comprehensive: Written

After completing residency, language, and course requirements, PhD candidates must pass the comprehensive examination consisting of four written examinations in the following fields: Greek literature, Latin literature, special author or topic, and area of concentration or minor field. With the approval of the adviser and the candidate's committee, extra course work beyond the required 12 hours may be substituted for the written examination in the area of concentration or minor field. Ancient Studies minors are automatically excused from the examination in the minor field.

## Comprehensive: Oral

The oral comprehensive examination is taken only after the candidate successfully passes the written examinations.

## Dissertation

Within one month of completion of both written and oral comprehensive exams, or at the beginning of the Fall term if the exams are taken in May, the candidate must meet with the doctoral program committee to obtain formal approval of the dissertation topic. Continuous enrollment must be maintained while the candidate completes the dissertation. At least

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eight hours of dissertation credit are required. A final oral defense of the dissertation is held upon completion of the dissertation.

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## Communication

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M. J. Porter, Chair  
College of Arts and Science  
108 Switzler Hall  
(573) 882-4431  
<http://communication.missouri.edu>

The Department of Communication offers courses in creating and critically evaluating messages. These messages persuade, inform and entertain in contexts such as one-to-one interactions, communication in organizations, and media. Students prepare for careers in broadcasting, sales, public relations, law, politics, marketing and new media.

The department offers BA, MA and PhD degrees with majors in Communication.

### Faculty

**Associate Professor** J. Aubrey\*\*, D. S. Dougherty\*\*, M. S. McKinney\*\*, R. Meisenbach\*\*, M. J. Porter\*

**Assistant Professor** L. Behm-Morawitz\*\*, M. Click\*\*, C. Colaner\*\*, C. Hesse\*\*, J. B. Houston\*\*, B. Warner\*

**Associate Professor Emeritus** M. J. Smythe

**Adjunct Professor** D. Dunkin, M. W. Dunn\*, R. Karwoski

**Professor Emeritus** L. Reid

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 165)
- BA in Communication (p. 166)

### Admission

Because of student interest in communication programs, admission is restricted. Students must apply for admission no earlier than the first semester of their sophomore year, or during the semester in which they will complete 45 credits. A copy of the admission procedures and policies is available in the department office or at <http://communication.missouri.edu>.

The student's grade point average from the MU system as adjusted by the MU grade repeat policy and the grade point averages in completed communication courses at MU are the primary criteria used to determine admission to the program.

### Transfer Student Admission

Transfer students are not eligible for admission until they have completed at least one semester in residence (12 credits) and a communication course in residence. Students who are not admitted may reapply for consideration in subsequent terms.

### Departmental Honors

To receive departmental honors, a student must earn a minimum overall MU GPA of 3.3 and a minimum GPA of 3.5 in courses in communication completed at the University of Missouri. Students must also earn a grade of A+, A, or A- in COMMUN 4974 or COMMUN 4975, a research project completed for a minimum of 3 credits with a regular faculty member, or a creative project completed for a minimum of 3 credits with a regular faculty member.

### Graduate

Communication Graduate Programs  
College of Arts and Science  
108 Switzler Hall  
573-882-4431  
<http://communication.missouri.edu/>

**Director of Graduate Studies:** Mitchell McKinney

- MA in Communication (p. 167)
- PhD in Communication (p. 168)

### About the Program

The program takes a theoretical, critical, and experimental approach to the study of communication. The MA program is designed to further enhance the understanding of the communication process by allowing students to study various aspects of communication in greater depth. Graduates are employed in corporate communication, educational and instructional media, sales, research and consulting. The doctoral program is designed for those interested in an academic career of college or university teaching and research. Doctoral students graduate with a strong theoretical background in interpersonal, mass media, organizational, or political communication.

### Funding

Graduate students are eligible to apply for fellowships and graduate teaching assistantships. Funding is normally limited to doctoral students.

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## Undergraduate

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### Department Level Requirements - Communications

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### Departmental Honors

To receive departmental honors, a student must earn a minimum overall MU GPA of 3.3 and a minimum GPA of 3.5 in courses in Communication completed at the University of Missouri. Students must also earn a grade of A+, A, or A- in COMMUN 4974 or COMMUN 4975, a research project completed for a minimum of 3 credits with a regular faculty member, or a creative project completed for a minimum of 3 credits with a regular faculty member.

# BA in Communication

## Major Program Requirements

The major in communication includes a minimum of 30 hours and a maximum of 40 hours in communication courses. Each course is 3 credits unless otherwise noted. Students must also complete College of Arts and Sciences and University requirements (p. 126), including University general education (p. 18) requirements.

### Major core requirements

COMMUN 1200	Public Speaking	3
COMMUN 3050	Survey of Communication Studies	3
COMMUN 4974	Senior Project	3
or COMMUN 4940	Internship	
Total Credits		9

## Areas of Focus

In addition to required courses, a student must select one of three areas of focus. Students must complete 12-15 hours in one area of focus including one of the core courses in that area (\*). The student must take one course in each of the other areas of focus. A course may only count once toward meeting these requirements. (Areas of Focus will not appear on transcripts or diplomas.)

### Interpersonal Focus:

COMMUN 3422	Communication Research Methods	3
COMMUN 3441	Nonverbal Communication *	3
COMMUN 3470	Culture as Communication	3
COMMUN 3525	Conflict and Communication	3
COMMUN 3561	Relational Communication *	3
COMMUN 3571	Group Decision Making Processes	3
COMMUN 4412	Gender, Language, and Communication	3
COMMUN 4415	Language and Discourse	3
COMMUN 4440	Ethical Issues in Communication	3
COMMUN 4520	Family Communication	3
COMMUN 4530	Health Communication	3
COMMUN 4474	Theory and Research in Persuasion	3

### Organizational Communication Focus:

COMMUN 3422	Communication Research Methods	3
COMMUN 3460	Organizational Advocacy *	3
COMMUN 3470	Culture as Communication	3
COMMUN 3525	Conflict and Communication	3
COMMUN 3571	Group Decision Making Processes	3
COMMUN 3575	Business and Professional Communication	3
COMMUN 3580	Crisis Communication	3
COMMUN 4412	Gender, Language, and Communication	3
COMMUN 4440	Ethical Issues in Communication	3
COMMUN 4474	Theory and Research in Persuasion	3
COMMUN 4476	Organizational Communication *	3

### Mass Media Focus

COMMUN 2100	Media Communication in Society *	3
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COMMUN 3310	Message Design and Writing for the Media	3
COMMUN 3390	Digital Production I	3
COMMUN 3395	Digital Production II	3
COMMUN 3422	Communication Research Methods	3
COMMUN 3490	Mass Media Theory	3
COMMUN 3636	Contemporary Issues in Mass Communication	3
COMMUN 4473	Political Communication *	3
COMMUN 4474	Theory and Research in Persuasion	3
COMMUN 4618	Television Program Analysis and Criticism	3
COMMUN 4628	Children, Adolescents and the Media	3
COMMUN 4638	New Technologies and Communication	3

### Political Communication

COMMUN 3422	Communication Research Methods	3
COMMUN 3470	Culture as Communication	3
COMMUN 3572	Argument and Advocacy	3
COMMUN 3575	Business and Professional Communication	3
COMMUN 3580	Crisis Communication	3
COMMUN 4412	Gender, Language, and Communication	3
COMMUN 4440	Ethical Issues in Communication	3
COMMUN 4473	Political Communication *	3
COMMUN 4474	Theory and Research in Persuasion	3
COMMUN 4481	Principles of Rhetoric	3

### Electives (beyond 30 hours)

COMMUN 2315	Basic Audio Production and Performance	3
COMMUN 3315	Advanced Audio Production	3
COMMUN 3570	Performance of Literature	3
COMMUN 4940	Internship	1-99

### Potential options for each area of focus depending on specific topic:

COMMUN 2701 & COMMUN 2703 & COMMUN 2705	Topics in Communication - General and Topics in Communication - Behavioral Science and Topics in Communication - Humanities/Fine Arts	3
COMMUN 3701 & COMMUN 3703 & COMMUN 3705	Topics in Communication-General and Topics in Communication-Behavioral Sciences and Topics in Communication-Humanities	1-3
COMMUN 4701 & COMMUN 4703 & COMMUN 4705	Topics in Communication-General and Topics in Communication-Behavioral Science and Topics in Communication-Humanities	1-3
COMMUN 4996H & COMMUN 4997H	Honors in Communication and Honors in Communication	2
COMMUN 4960	Directed Reading	1-3

\* Students must complete 12-15 hours in one area of focus including one of the core courses in that area.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000 or MATH 1100	3	ENGLISH 1000 or MATH 1100	3
American Government Requirement (Social Science Course)	3	Humanities Course *	3
Behavioral Science Course *	3	COMMUN 1200	3
Humanities Course *	3	IS_LT 1111	1
or Optional Elective Course	0-3	Biological/Physical/Mathematical Science with Lab*	5
		or Foreign Language	
	12-15		15
Second Year			
Fall	Credits	Spring	Credits
Humanities Course (Writing Intensive) *	3	Humanities Course (1000+) *	3
Behavioral Science Course (1000+) *	3	COMMUN 3050 (or Foreign Language or Elective)	3-5
COMMUN or elective 1200		Biological/Physical/Mathematical Science Course *	3-5
Biological/Physical/Mathematical Science Course (Math Reasoning Proficiency) *	3	Minor	3
Foreign Language or Elective	3-5	Social Science Course *	3
		ADDITIONAL ELECTIVES TO REACH 60 CREDIT HOURS (if needed)	?
	12-14		15-19
Third Year			
Fall	Credits	Spring	Credits
Social Science Course (1000+) *	3	Communications Course **	3
Communications Course **	3	Communications Course **	3
Communications Course **	3	Minor	3
Minor or Related Field Course	3	Elective or Additional Communications Course ***	3
Elective or Additional Biological/Physical/Mathematical Science Course (if needed)	3-5	Elective Course	3
	15-17		15
Fourth Year			
Fall	Credits	Spring	Credits
Communications Course **	3	COMMUN 4974 or 4975 (Communications Capstone)	3
Communications Course **	3	Communications Course Elective or additional course	3
Minor or Elective Course	3	Communication Minor or elective	3
Elective or Additional Communication Course ***	3	Elective Course	3

COMMUN 4940 ***	3	Elective Course	3
	15		15
Total Credits: 114-125			

\* From A&S list available from A&S Advising (<http://coas.missouri.edu/advising/index.shtml>) or academic Exploration Web (<http://aeas.missouri.edu>) Page.

\*\* One Communication course must be COMMUN 3050, writing intensive.

\*\*\* May not exceed 40 hours in the major.

## Graduate

### MA in Communication

#### Admission Contact Information

Martha Crump ([crumpm@missouri.edu](mailto:crumpm@missouri.edu))  
 108 Switzler Hall; Columbia, MO 65211  
 573-882-4432

#### Admission Criteria

Fall deadline: January 15

- Minimum GPA: 3.0
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	600

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	500	500	4.0
On or After August 1, 2011	153	144	4.0

Students who do not have an undergraduate degree in communication may be required to take course work beyond the required 30 hours to provide necessary background.

#### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Communication Program* (<http://communication.missouri.edu/graduate/admissions.html>)

- Departmental application
- 3 letters of recommendation
- Example of scholarly writing (no more than 25 pages)
- Transcripts
- Statement of purpose (no more than 500 words) explaining the student's intended field of study, professional goals and other reasons for wishing to enter the graduate program
- GRE scores
- Resume

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Plan of Study

Not more than 6 semester hours of the required 30 hours of credit may be transferred from another university or campus of the University of Missouri System. There is no language requirement. For the assignment of advisers, students should see the director of graduate studies.

## Thesis and Non-thesis Options

The master of arts degree may be completed under either a thesis option, approved by an advisory committee, or a non-thesis option (with a comprehensive examination and project). Both plans require a minimum of 30 hours of graduate credit, including at least 15 hours of course work at the 8000/9000 level. MA candidates may take up to 6 hours of credit for their MA project for the non-thesis option. MA candidates take a minimum of 6 hours in 9090 Thesis Research for the thesis option.

## Credit Hours for Production

No more than 9 hours of course work or independent study in television production or scriptwriting will be accepted for the MA degree. Students may opt to take more production hours but they may not be included in the candidate's plan of study.

## Length of Study

The MA must be completed in 8 years.

## PhD in Communication

### Admission Contact Information

Martha Crump (crumpm@missouri.edu)  
108 Switzler Hall; Columbia, MO 65211  
573-882-4432

### Admission Criteria

Fall deadline: January 15  
Minimum GPA: 3.0 preferred  
Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	600

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	500	500	4.0
On or After August 1, 2011	153	144	4.0

Admission procedures for students who have completed the MA degree elsewhere and wish to become PhD candidates are identical to the departmental requirements outlined for MA candidates. Only those

applicants who show evidence of a clear likelihood of successful doctoral work are admitted.

## Required Application Materials

To the Graduate School

All required Graduate School documents

## To the Communication Program

- GRE scores
- Departmental Application
- 3 letters of recommendation
- Example of scholarly writing (no more than 25 pages)
- Transcripts
- Statement of Interest
- Resume

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Plan of Study

Before registering for courses, the student must confer with their temporary adviser until a permanent adviser is assigned.

## Committee and Qualifying Requirements

A doctoral program committee approves the student's course of study and determines if the student has passed the qualifying requirements during the spring semester of the first year. Only after passing the qualifying requirements will the student be admitted to candidacy for the PhD degree in communication.

For a student whose MA program was done at MU, the six-hour comprehensive examination or the MA thesis defense constitutes the qualifying process. The student may proceed beyond the MA degree only upon the recommendation of the MA examining committee.

## Courses

The PhD candidate must take at least 48 hours of course work beyond the MA. Students with an MA degree in another discipline may be required by their doctoral program committee to complete additional course work. Course work will include 36 hours within the department. The following courses are required:

COMMUN 8110	Introduction to Graduate Study in Communication	3
COMMUN 8120	Seminar in Quantitative Methods in Communication	3
COMMUN 9170	Research Practicum	3
COMMUN 9050	Research	3
One of the following:		3
COMMUN 8130	Topics in Qualitative Research Methods	
COMMUN 8160	Rhetorical Criticism	
COMMUN 8150	Seminar in Television Criticism	



COMMUN Content Analysis  
8140

Including the courses listed above, students must complete a total of 15 hours of research methods classes. Nine of these hours may be taken outside the department.

Students must also complete a 6-hour collateral field block outside the department representing a coherent unit of study and relates to an area of major research interest.

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Total Credits 36

## Comprehensive Examination

The comprehensive examination, including a 30-page literature review, a 15-hour written exam and an oral defense, will cover all areas of studies in the field. During the semester students take comprehensive exams they enroll in.

## Dissertation

The doctoral dissertation is written under the direction of the candidate's adviser. The dissertation and the final oral examination on the dissertation complete the requirements for the PhD in communication. Students take a minimum of six hours of.

## Length of Study

Course work and comprehensive exams for the PhD must be completed in five years. The dissertation must be completed within five years of completing comprehensive examinations. Satisfactory rate of progress means making adequate progress to meet these time requirements. Students working at a typical pace should be able to complete the doctorate in 4 years beyond their master's.

## Computer Science

Cooperative program between the College of Arts and Science and the College of Engineering

The Bachelor of Arts with a major in Computer Science emphasizes the applications of computer science. Students are encouraged to select courses in areas that complement their computer science major. These can include courses in computer animation, business, art, music, geography and many other areas. Courses in digital logic, database management, computer languages, business-oriented calculus and basic statistics prepare the student for a variety of professional settings.

Graduates of the BA program have stronger backgrounds in computer science than graduates of typical data processing or management information systems programs. With the proper choice of electives, BA graduates are prepared to enter advanced degree programs in such areas as business, medicine, law and the arts.

While working toward their degrees, many computer science students participate in cooperative education or internship programs. In doing so, they gain valuable professional experience and often are exposed to equipment and software that may not be available on the campus. Many students return to the co-op or internship company upon graduation.

### Faculty

**Professor** Y. Shang\*\*, C. R. Shyu\*\*, D. Xu\*\*, W. Zeng\*\*, Y. Zhao\*\*, X. Zhuang\*\*

**Associate Professor** J. Cheng\*\*, Y. Duan\*\*, W. L. Harrison\*\*, M. Jurczyk\*\*, T. Kazic\*\*, K. Palaniappan\*\*, Y. Saab\*\*, G. K. Springer\*\*, J. Uhlmann\*\*

**Assistant Professor** P. Calyam\*\*, R. Chadha\*\*, D. Korkin\*\*

**Associate Teaching Professor** D. Musser\*

**Adjunct Professor** J. M. Keller\*\*, S. Nair\*\*, M. Skubic\*\*

**Adjunct Associate Professor** G. DeSouza\*\*

**Adjunct Assistant Professor** M. Becchi\*\*, M. Popescu\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 170)
- BA in Computer Science (p. 170)

### Graduate

While the College of Arts and Science does not offer any graduate level degrees in Computer Science, the College of Engineering does through their Department of Computer Science (p. 424). There you will find full information on the MS and PhD degrees in Computer Science (p. 425). Also for those interested in computer science, the University offers an interdisciplinary PhD in Informatics (p. 614).

## Courses

Computer Science courses are listed under the College of Engineering Computer Science course page. (p. )

## Undergraduate

### Department Level Requirements - Computer Science

There are no requirements at the department level for this degree. Please see the BA in Computer Science (p. 170) page for degree requirements.

## BA in Computer Science

### Major Program Requirements

The BA requires the completion of 120 credits. To graduate, a student must earn a 2.0 GPA or better in all courses required in the major. A 2.0 GPA is required in CMP SC courses, counting toward the grade point average every time a course is taken with the exception of courses for which the course repeat policy has been used. One excused D is allowed in the courses required in the major.

#### Computer Science Courses

CMP_SC 1000	Introduction to Computer Science	1
CMP_SC 1050	Algorithm Design and Programming I	3
CMP_SC 2050	Algorithm Design and Programming II	3
CMP_SC 3270	Introduction to Digital Logic	3
CMP_SC 3330	Object Oriented Programming	3
CMP_SC 3380	Database Applications and Information Systems	3
CMP_SC 3530	UNIX Operating System	3
CMP_SC 4320	Software Engineering I	3
CMP_SC 4970	Senior Capstone Design I	3
CMP_SC 4980	Senior Capstone Design II	2

**Twelve credit hours of upper-class major electives are required. Six hours of IT 4000 level electives are allowed if a student has the prerequisite; for a selection see advisor. CS elective choices are listed below.**

CMP_SC 2830	Introduction to the Internet, WWW and Multimedia Systems	3
CMP_SC 3280	Computer Organization and Assembly Language	3
CMP_SC 3940	Internship in Computer Science	1-3
CMP_SC 4001	Topics in Computer Science	1-99
CMP_SC 4330	Object Oriented Design I	3
CMP_SC 4380	Database Management Systems I	3
CMP_SC 4450	Principles of Programming Languages	3
CMP_SC 4610	Computer Graphics I	3
CMP_SC 4830	Science and Engineering of the World Wide Web	3

#### Math requirements

MATH 1300	Finite Mathematics	3
MATH 1400	Calculus for Social and Life Sciences I	3
STAT 2500	Introduction to Probability and Statistics I	3

## Arts and Science Foundation Requirements

ENGLISH 1000 Exposition and Argumentation (C-range grade is required) 3

Foreign language sequence 12-13

### Breadth of Study

Biological or physical science 3-6

Behavioral sciences (anthropology, psychology or sociology) 5-6

Social sciences (from at least two of the following fields) 6

### History, economics, political science or geography

State law requires one of these courses in American history or American government: 3

HIST 1100 Survey of American History to 1865

HIST 1200 Survey of American History Since 1865

HIST 1400 American History

HIST 2440 History of Missouri

HIST 2210 Twentieth Century America

HIST 4000 Age of Jefferson

HIST 4220 U.S. Society Between the Wars 1918-1945

HIST 4230 Our Times: United States Since 1945

POL\_SC 1100 American Government

POL\_SC 2100 State Government

Humanities/fine arts (from at least three different departments) 12

Total Credits 44-49

### Depth of Study

Among the courses taken to meet the social science, behavioral science, humanities/fine arts, and biological and physical sciences requirements, at least three courses from at least two of the four areas must be numbered 2000 or above. One 3-credit course must be completed under the auspices of MU. At least 30 hours must be at the 3000 level or above.

Two courses must be designated Writing Intensive. A C-range grade or better in ENGLISH 1000 is prerequisite for all WI courses. A C-range grade or better is required in the WI courses.

For other graduation requirements see University general education requirements (p. 18) and College of Arts and Science foundation requirements (p. 126).

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

First Year			
Fall	Credits	Spring	Credits
CMP_SC 1000	1	CMP_SC 2050	3
CMP_SC 1050	3	MATH 1400	3
MATH 1300	3	ENGLISH 1000	3
Constitutional/state law elective	3	Humanities/Fine Arts	3
Behavioral science	3	Minor	3

General elective	2		
	15		15
Second Year			
Fall	Credits	Spring	Credits
CMP_SC 3330	3	CMP_SC 3270	3
STAT 2500	3	Major CS/IT Elective	3
Humanities/Fine Arts	3	Major CS/IT Elective	3
Social science	3	Foreign language	5
Behavioral science	3	General elective	1
	15		15
Third Year			
Fall	Credits	Spring	Credits
CMP_SC 3530	3	CMP_SC 4320	3
CMP_SC 3380	3	Foreign language	3
Foreign Language	5	Minor	3
General Elective	1	Social Science	3
Science with Lab	3	Humanities/Fine Arts	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
CMP_SC 4970	3	CMP_SC 4980	2
Major CS/IT Elective	3	Major CS/IT Elective	3
Humanities/Fine Arts	3	Minor	3
Minor	3	General Elective	3
Minor	3	General Elective	4
	15		15
Total Credits: 120			

## Economics

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D. M. Mandy, Chair  
College of Arts and Science  
118 Professional Building  
(573) 882-4574  
Kunzaj@missouri.edu

Director of Undergraduate Studies/Scholarship Information  
J. Isaac Miller  
221 Professional Building  
(573) 882-0063  
muaseconadvising@missouri.edu

Undergraduate Advising Contact  
Lindsey Hagglund  
101 Professional Building  
(573) 882-0063  
muaseconadvising@missouri.edu

Graduate Contact  
Lynne Riddell  
118 Professional Building  
(573) 884-7989  
Riddell@missouri.edu

The Department of Economics takes a global view of economics, with an emphasis on applied problems. An economics major prepares students for careers in business and government and for graduate work in areas such as economics, business and law. A basic understanding of economics develops insight into the many issues facing contemporary society, such as corporate downsizing, environmental pollution, urban decay, poverty, international trade, health care, educational reform, politics and sports deals.

In addition to the BA and the BS degree in the College of Arts and Science, the Economics Department offers a concentration within the Bachelor of Science in Business Administration (BSBA) degree in the College of Business. The department also offers MA and PhD degrees in Economics. A minor is also available.

## Faculty

**Cook Professor** C. Otrok\*\*

**Foster Professor** R. Harstad\*\*

**Lay Professor** J. H. Haslag\*\*

**Research Professor** W. A. Brock

**Professor** D. M. Mandy\*\*, J. Milyo\*\*, P. Mueser\*\*, X. Ni\*\*, M. J. Podgursky\*\*, X. Wang\*\*

**Associate Professor** S. P. Aura\*\*, E. M. Basker\*\*, O. Loginova\*\*, J. I. Miller\*\*, N. A. Raymon\*, V. Trindade\*\*

**Associate Teaching Professor** M. Lee, S. A. Ryan

**Associate Research Professor** M. Ehlert

**Assistant Professor** C. Gu\*\*, D. Kaplan, C. Koedel\*\*, D. Lee\*

**Assistant Teaching Professor** G. Chikhladze

**Assistant Adjunct Professor** K. Choe, S. K. Klein

**Professor Emeritus** W. W. Hicks, M. L. Lee, C. F. Menezes, R. Wallace

**Associate Professor Emeritus** C. Geiss, D. Schilling

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 173)
- BA in Economics (p. 173)
- BS in Economics (p. 174)
- Minor in Economics (p. 175)

Before a graduation plan in economics will be approved, students in the College of Arts and Science must have an overall GPA of 2.5 after 30 credits or a GPA in economics of 2.67 after at least 8 credits of courses in economics.

## Double Majors, Dual Degrees and Five-Year Program

For double majors and dual degrees, students must satisfy all requirements of both degree programs. Some courses may be allowed to count toward both degrees. Carefully chosen elective courses in addition to required courses can facilitate double majors and dual degrees.

Common double majors in the College of Arts and Science are:

- BA with majors in Economics and Political Science, Psychology, History, English or Communication
- BS with majors in Economics and Statistics or Mathematics

Common dual degrees with other schools and colleges are:

- BA with majors in Economics and Journalism, Accountancy, Finance, Marketing or Education
- BS with majors in Economics and Engineering

By planning their courses carefully, Economics majors can earn a bachelor's and a master's degree in economics in five years. Students who are in the BA or BS programs are good candidates for this program. Students must be accepted to this program by the beginning of their senior year.

Students interested in pursuing any of these options should contact the Director of Undergraduate Studies in economics for further advising.

## Economics Emphasis Area in Business Administration Major

See the College of Business for requirements for the Bachelor of Science with a major in Business Administration (BS BA) with an emphasis in Economics (p. 327).

## Graduate

College of Arts and Science  
118 Professional Building  
573-884-7989  
573-882-2697 (fax)  
<http://economics.missouri.edu/>

**Director of Graduate Studies:** Xinghe Wang

- MA in Economics (p. 175)
- PhD in Economics (p. 176)

## About the Program

The Department of Economics offers graduate work leading to the master of arts and the doctor of philosophy degrees. The program prepares students for careers in government and private enterprises, colleges, universities and research institutions through training in the techniques and applications of economic analysis, interpretation of data and the formulation and appraisal of public policy. Admission may be granted at any time to qualified students.

## Degrees Offered

- MA and PhD in economics
- Cooperative Dual Degrees: MA in applied mathematics and economics, MA in economics and statistics, MA in economics and JD in law

## Specializations

The department offers fields of specialization in monetary economics, international economics, econometrics, public economics, industrial organization, labor economics, and quantitative microeconomic policy analysis.

## Dual Degrees

The Departments of Mathematics and Economics offer selected students the option of obtaining dual degrees: an MS degree in applied mathematics and an MA degree in economics. The Departments of Economics and Statistics offer selected students the option of obtaining dual degrees: an MS degree in statistics and an MA degree in economics within an integrated program. Whereas obtaining separate master's degrees would nominally require a minimum of 60 credit hours of course work, students enrolled in the dual master's degree program may obtain degrees based on 48 credit hours of course work. Students may be able to complete degree requirements within 2½ years.

## Financial Support

Student financial support is available to graduate students as teaching and research assistantships, allocated based on promise and performance in the program. In addition, direct fellowship support may also be available to selected candidates. Tuition is waived for students who receive assistantship or fellowship support. December 15 is the deadline for applications for assistantships for the school year beginning in August, but earlier submissions are desirable. Late applications will be accepted subject to the availability of openings and funds.

## Undergraduate

## Department Level Requirements - Economics

### Departmental Honors

Candidates for Economics departmental honors must be Economics majors with a GPA of 3.30 overall and a GPA of 3.50 or higher in Economics courses taken at the University of Missouri-Columbia. Candidates must complete ECONOM 4371, Introductory Econometrics, ECONOM 4995 (p. 172), Honors Proseminar, and ECONOM 4971 (p. 172) Supplemental Senior Seminar, during the junior or senior year and

must receive a grade of B or higher in order to be awarded Department Honors.

## BA in Economics

### Major Program Requirements – Economics

In addition to the major core requirements, students must complete college and University graduation requirements (p. 17) including University general education requirements (p. 18).

### Options

Students majoring in economics may earn either a BS or a BA degree. The last 21 credit hours in Economics must be completed in residence. Depending upon which degree is sought; students must choose one of the options below:

### BA with a major in Economics

The BA degree is designed for students who plan to continue their education in non-economics fields and for students who plan to seek employment after graduation. Post-graduate educational alternatives include law school or programs in the business school, political science and journalism. Post-graduate employment opportunities include positions in state government, banking, insurance or other financial sectors, and private sector businesses. Frequently, students in humanities or fine arts complete a BA in Economics as a second major in order to increase their employment potential.

### Major Core Requirements for BA Economics

**(Economics with a grade of C or above; grades of C- or below will not be accepted)**

#### General Principles

ECONOM 1014 & ECONOM 1015	Principles of Microeconomics and Principles of Macroeconomics	5-6
or ECONOM 1051	General Economics	
or ECONOM 1051H	General Economics - Honors	
ECONOM 4351	Intermediate Microeconomics	3
ECONOM 4353	Intermediate Macroeconomics	3
ECONOM 4371	Introductory Econometrics	3
ECONOM 4970	Senior Seminar in Economics (Capstone course)	3

#### Mathematics and Statistics (C- grades will be accepted)

MATH 1300 & MATH 1400	Finite Mathematics and Calculus for Social and Life Sciences I	5-6
or MATH 1500	Analytic Geometry and Calculus I	
STAT 2500	Introduction to Probability and Statistics I	3

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ECONOM 1014	3	ECONOM 1015	3
MATH 1100	3	MATH 1400	3
Foreign Language I	5	Foreign Language II	5
ENGLISH 1000	3	Lab Science	4
Elective	1		
	15		15
Second Year			
Fall	Credits	Spring	Credits
ECONOM 3000-level elective	3	ECONOM 4351	3
MATH 1300	3	STAT 2500	3
Foreign Language III	3	Behavioral Science	3
Social Science	3	Humanities	3
Humanities	3	American Government or History	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
ECONOM 4353	3	ECONOM WI elective	3
STAT 3500	3	ECONOM 4000-level elective	3
Humanities	3	Humanities	3
Behavioral Science	3	WI Elective	3
Social Science	3	Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
ECONOM 4371	3	ECONOM 4970	3
ECONOM 4000-level elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
	15		15
Total Credits: 120			

## BS in Economics

### Major Program Requirements

In addition to the major core requirements, students must complete college and University graduation requirements (p. 17) including University general education requirements (p. 18).

### BS with a Major in Economics

The BS degree is for students who plan to attend graduate school in economics or finance.

### Major Core Requirements for BS

**Economics (with a grade of C or above; grades of C- or below will not be accepted)**

### General Principles

ECONOM 1014 & ECONOM 1015	Principles of Microeconomics and Principles of Macroeconomics	5-6
or ECONOM 1051	General Economics	
or ECONOM 1051H	General Economics - Honors	
ECONOM 4351	Intermediate Microeconomics	3
ECONOM 4353	Intermediate Macroeconomics	3
ECONOM 4370	Quantitative Economics	3
ECONOM 4371	Introductory Econometrics	3
ECONOM 4970	Senior Seminar in Economics (Capstone course)	3
Mathematics and Statistics (C- grades will be accepted)		
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4140	Matrix Theory	3
STAT 4750 & STAT 4760	Introduction to Probability Theory and Statistical Inference	6
or STAT 4710 & STAT 4510	Introduction to Mathematical Statistics and Applied Statistical Models I	
MATH 3000	Introduction to Advanced Mathematics (or STAT 4000+ (Economics Dept. approved course))	3
or MATH 4100	Differential Equations	
	or STAT 4000+ (economics Dept. approved course)	

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

First Year			
Fall	Credits	Spring	Credits
ECONOM 1014	3	ECONOM 1015	3
MATH 1160	5	MATH 1500	5
American Government or History	3	Behavioral Science	3
ENGLISH 1000	3	Lab Science	4
Elective	1		
	15		15
Second Year			
Fall	Credits	Spring	Credits
ECONOM 4351	3	ECONOM 4353	3
ECONOM 3000-level elective	3	MATH 2300	3
MATH 1700	5	Behavioral or Social Science	3
Foreign Language I (or alternative)	3-5	Foreign Language II (or alternative)	3-5
		Humanities	3
	14-16		15-17
Third Year			
Fall	Credits	Spring	Credits
ECONOM WI elective	3	ECONOM 4000-level elective	3

MATH 4140	3	STAT 4710	3
Foreign Language III (or alternative)	3	Foreign Language elective (or alternative)	3
Humanities	3	Humanities	3
Elective	3	Elective	3
	<b>15</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ECONOM 4370	3	ECONOM 4970	3
ECONOM 4371	3	MATH 4100	3
STAT 4510	3	Elective	3
Elective	3	Elective	3
Elective	3-4	Elective	3
	<b>15-16</b>		<b>15</b>
Total Credits: 119-124			

## Foreign Language Alternative (for BS degree)

The student may elect to fulfill a special option area instead of taking a foreign language. This area consists of at least 12 credits numbered 2000 or above that are not from the parent department, are not normally required of all departmental majors and do not appear elsewhere in the area of concentration. This program is planned by the student's advisor and must be approved by the Director of Undergraduate Studies or Economics Academic Advisor.

## Electives

At least four (for the BA) or three (for the BS) of the following, with not more than one at the 3000 level, selected with the advisor and completed with a grade of C or above; grades of C- or below will not be accepted:

ECONOM 3004	Topics in Economics - Social Science	1-3
ECONOM 3224	Introduction to International Economics	3
ECONOM 3229	Money, Banking and Financial Markets	3
ECONOM 4004	Topics in Economics- Social Science	1-3
ECONOM 4311	Labor Economics	3
ECONOM 4315	Public Economics	3
ECONOM 4325	The International Monetary System	3
ECONOM 4326	Economics of International Trade	3
ECONOM 4329	The Banking System and the Money Market	3
ECONOM 4340	Introduction to Game Theory	3
ECONOM 4345	Economics of Education	3
ECONOM 4355	Industrial Organization and Competitive Strategy	3
ECONOM 4357	Health Economics	3
ECONOM 4360	Economic Development	3
ECONOM 4367	Law and Economics	3
ECONOM 4370	Quantitative Economics (Elective for BA, Required for BS)	3
ECONOM 4385	Problems in Economics	1-3
ECONOM 4965	Independent Study in Economics	1-3

### NOTE:

Any two of ECONOM 3224, ECONOM 4325 and ECONOM 4326 may be taken for credit. But if all three are taken, ECONOM 3224 will not count towards an economics degree.

Either ECONOM 3229 or ECONOM 4329 may be taken for an economics degree. If both are taken, only one will count towards an economics degree.

Either ECONOM 4385 or ECONOM 4965 may be taken for an economics degree. If both are taken, only one will count towards an economics degree, unless approved by the Director of Undergraduate Studies.

## Minor in Economics

Students wishing to minor in economics must take a minimum of 18 credits in economics and the last 12 credit hours in residence. Courses must include ECONOM 1014 and ECONOM 1015 (or ECONOM 1051 instead of the previous two courses\*) and ECONOM 3251 or ECONOM 4351 plus three economics electives including at least one at the 4000 level. All required courses must be completed with a grade of C or above; grades of C- or below will not be accepted. Students who take both ECONOM 3251 and ECONOM 4351 will receive credit for only one of these courses.

\* A minor may be earned with 17 credits in economics by students who take ECONOM 1051H rather than ECONOM 1014 (ECONOM 1024)/ECONOM 1015; but not by students who take ECONOM 1051. The one credit hour reduction is exclusively for students who take the Honors section of ECONOM 1051.

## Graduate

### MA in Economics

#### Admission Contact Information

Lynne Riddell riddell@missouri.edu.  
118 Professional Bldg.  
Columbia, MO 65211  
573-884-7989

#### Admission Criteria

Fall deadline: December 15  
Spring deadline: October 1

#### Bachelor's degree in any field

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative
Prior to August 1, 2011	400	700
On or After August 1, 2011	146	155

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

Minimum Academic IELTS scores:

Item	Score
Overall score	6.0

Students with a bachelor's degree in any field may apply for admission into the master's program. Applicants are admitted on the basis of an undergraduate record, with particular emphasis on performance in economics, mathematics, and statistics courses, performance on the

GRE, and letters of recommendation. Although the graduate program assumes mathematical background through calculus (normally two or three semesters of college calculus), as well as undergraduate economics training, applicants with more limited backgrounds may be accepted into the program. Such individuals will be assigned supporting course work, some or all of which may be counted toward fulfilling requirements.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- Resume (uploaded through the online application or mailed directly to the department)
- Personal statement (uploaded through the online application or mailed directly to the department)

*To the Economics Program:*

- Official transcripts from each college or university attended. The department will forward the transcripts to the Graduate School
- 3 letters of recommendation (uploaded through the online application or mailed directly to the department)
- Official GRE scores
- International students: copy of official TOEFL or IELTS scores

## Degree Requirements

To fulfill requirements for the MA degree, a candidate must complete a 30-hour approved program of study. This includes 15 credit hours of core courses:

ECONOM 8451	Microeconomic Theory <sup>1</sup>	3
ECONOM 8370	Mathematics for Economics	3
ECONOM 8453	Macroeconomic Theory <sup>1</sup>	3
ECONOM 8472	Econometric Methods I <sup>1</sup>	3
ECONOM 8473	Applied Econometrics	3
STAT 7710	Introduction to Mathematical Statistics	3
ECONOM 8413	Research Workshop I	3

<sup>1</sup> ECONOM 9451 may be substituted for ECONOM 8451, ECONOM 9453 may be substituted for ECONOM 8453, ECONOM 9473 may be substituted for ECONOM 8472, and enrollment in 9000-level courses may require consent of the department and/or the instructor.

## PhD Track

Students can also earn an MA while working toward a PhD by passing the comprehensive examination.

## PhD in Economics

### Admission Contact Information

Lynne Riddell riddell@missouri.edu.  
118 Professional Bldg.; Columbia, MO 65211  
573-884-7989

### Admission Criteria

Fall deadline: December 15  
Spring deadline: October 1

The minimum requirements for admission into the PhD program are

Undergraduate GPA 3.0

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative
Prior to August 1, 2011	400	700
On or After August 1, 2011	146	155

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

Minimum Academic IELTS scores:

Item	Score
Overall Score	6.0

Ordinarily, to be accepted for advisement in the PhD program, a student must have a master's degree in economics, or, alternatively, the student must meet the requirements for admission to the MA program, together with the requirement of an adequate background in economics, mathematics and statistics.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- Resume (uploaded through the online application or mailed directly to the department)
- Personal statement (uploaded through the online application or mailed directly to the department)

*To the Economics Program* (<http://economics.missouri.edu/graduate/index.shtml>):

- Official transcripts from each college or university attended. The department will forward the transcripts to the Graduate School
- 3 letters of recommendation (uploaded through the online application or mailed directly to the department)
- Official GRE scores
- International students: copy of official TOEFL or IELTS scores

## Degree Requirements

The PhD program is designed to encompass training in economic theory and quantitative methods, as well as flexibility for students in choosing course work to suit their interests and intended careers.

For those entering the program with a bachelor's degree, the following courses are required:

STAT 7710	Introduction to Mathematical Statistics	3
ECONOM 8370	Mathematics for Economics	3
ECONOM 8451 & ECONOM 9451 & ECONOM 9452	Microeconomic Theory and Advanced Microeconomic Theory I and Advanced Microeconomic Theory II (microeconomics)	9
ECONOM 8453 & ECONOM 9453 & ECONOM 9454	Macroeconomic Theory and Advanced Macroeconomic Theory I and Advanced Macroeconomic Theory II (macroeconomics)	9



ECONOM 8472 & ECONOM 9473 & ECONOM 9474	Econometric Methods I and Econometric Methods II and Econometric Methods III (econometric methods)	9
ECONOM 9413	Research Workshop II (PhD research workshop)	6
	9000-level economics courses in each of two areas of specialization	6
	Two other 9000-level economics courses (excluding ECONOM 9090 and ECONOM 9480)	
	3 additional credit hours of elective course work within the department, or approved courses in related areas outside economics	3
	Dissertation research	12
<b>Total Credits</b>		<b>60</b>

Courses taken to satisfy these requirements (except dissertation research) may be taken while earning an MA at MU, or, as with students entering the program with prior graduate coursework, at other accredited colleges and universities as recommended by the Graduate Studies Committee.

## Examinations

### Qualifying Examination

Students pursuing the PhD degree must pass a qualifying examination. Upon completion of relevant required courses in the first year, students take the qualifying examination, which is a written examination that covers microeconomic concepts, calculus, matrix algebra, optimization, statistics and econometrics. The exam is 6 hours in length, usually administered in parts over two days. The exam must be taken in May following the first year of graduate study and is graded in three levels: 0, 1, and 2. Students who receive a score of 2 pass the exam. Students who receive a score of 1 may retake the exam the following August. Students who receive a score of 0 fail and may not continue in the PhD program. Only pass and fail grades will be awarded on the August exam. Students who fail the exam may continue in the MA program.

### Comprehensive Examination

Students pursuing the PhD degree must pass a comprehensive examination. The comprehensive exam has a written section and an oral section. Upon completion of required courses in the second year, students take the written portion of the comprehensive examination, which covers all second-year courses (Microeconomics, Macroeconomics, and Econometrics). The exam is 6 hours in length; it is administered in parts, with two-hours devoted to each of the three core subjects. The first offering of the exam is in May. Students who fail to pass all three parts of the exam the first time may retake the failed part(s) the following August. Students who fail the written exam may continue in the MA program. The oral portion of the comprehensive exam is administered by the student's dissertation committee as part of the dissertation proposal defense. At the discretion of the student's dissertation committee, written questions over the fields relevant to the proposal may be included as part of the proposal defense.

\* Applicants with outstanding background may be selected by the Graduate Studies Committee to be offered the opportunity to take the August qualifying exam prior to the start of their first semester. Such students who pass the August qualifying exam will move directly to second year courses. Students who fail will start with the normal first year courses.

## Specialization

### Fields

Students are required to complete a course of study in two defined areas of specialization. It is expected that one of the areas will be related to the objectives of the student's dissertation. The exact areas of specialization from which the student can choose are listed below. Each course of study consists of two classes in the area followed by a research paper. Students are required to receive a passing grade in each course along with a passing grade on the research paper. The instructors of the field courses oversee the content of the research paper and the instructor of the Ph.D. research workshop (ECONOM 9413) oversees the mechanics of the paper. A field requirement is satisfied after both field course instructors and the ECONOM 9413 instructor sign off on the paper. Students are not allowed to combine courses from separate fields. The department commits itself to offering a second course in any field to all students who have completed an initial course in the field, within two semesters of the student completing the initial course (not counting the summer semester). This course may consist of a readings course with one of the faculty members in the field in lieu of a regular course. If a readings course is provided, then the faculty member is required to provide the department with the reading list for the course.

### List of Fields and Courses

#### Econometrics

ECONOM 9476	Advanced Topics in Econometrics I	3
ECONOM 9477	Advanced Topics in Econometrics II	3

#### Industrial Organization

ECONOM 9455	Monopoly and Competition	3
ECONOM 9471	Advanced Game Theory	3

#### International Economics

Select any two of:

ECONOM 9426	International Trade	
ECONOM 9427	Topics in International Trade	
ECONOM 9460	Development Economics	

#### Labor Economics

ECONOM 9411	Advanced Labor Economics I	3
ECONOM 9412	Advanced Labor Economics II	3

#### Monetary Economics

ECONOM 9430	Advanced Money and Banking	3
ECONOM 9431	Central Banking Policies	3

#### Public Economics

ECONOM 9415	Advanced Public Economics I	3
ECONOM 9416	Advanced Public Economics II	3

#### Public Policy - Public/International

ECONOM 9415 or ECONOM 9416 or ECONOM 9426 or ECONOM 9427	Advanced Public Economics I or Advanced Public Economics II or International Trade or Topics in International Trade	3
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or ECONOM 9460 Development Economics

**Quantitative Microeconomic Policy Analysis**

ECONOM 9446 Advanced Empirical Methods 3  
ECONOM 9447 Topics in Microeconomic Policy Analysis 3

## Dissertation

The dissertation must make a substantial contribution to knowledge. Upon completion of the dissertation, students pursuing the Ph.D. degree must pass a final oral examination. This exam can include an evaluation of the dissertation, the student's defense of the dissertation, and the student's general comprehension of economics, and is open to the academic community.

## Statement on Satisfactory Progress

1. Taking and completing required course work on schedule and maintaining a GPA of at least 3.0.
2. Enrollment in a full-time plan of study, i.e., completion of at least 9 graded hours per semester.
3. Taking and passing qualifying and comprehensive examinations on schedule.
4. Students who have completed all course work and are working on the final stage of the PhD program are encouraged to present their written proposal within a reasonable amount of time.

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## English

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David Read, Chair  
College of Arts and Science  
114 Tate Hall  
(573) 882-6421

The English Department provides a major with optional tracks in literature, African Diaspora Studies, language, creative writing and folklore/oral tradition. A major in English develops skills in reading, critical thinking, and writing. A degree in English is not intended to provide specific vocational training but rather to give a broad, open-ended education that can lead to many different careers, especially those requiring excellent communication skills.

Recent graduates have gone on to careers in teaching, publishing, television, film, advertising, public relations, insurance, and government. In addition, English is excellent preparation for graduate or professional schools such as law and business.

The department offers BA, MA, and PhD degrees with majors in English. Two minors are also available, the English minor and the English writing minor.

## Faculty

**Curators Professor** E. Lawless\*\*

**Professor** A. Barnstone\*\*, S. Cairns\*\*, C. Eady\*, C. Hudson-Weems\*\*, T. L. Lewis\*\*, R. S. Morgan\*\*, P. Okker\*\*, K. L. Piper\*\*, A. Prahlad\*\*, E. Ragland\*\*, D. T. Read\*\*, R. B. Schwartz\*, M. A. Swick\*\*, N. M. West\*\*

**Associate Professor** V. M. Carstens\*\*, E. Chang\*\*, S. Cohen\*\*, F. Dickey\*\*, R. Dingo\*\*, J. O. Evelev\*\*, E. F. Glick\*\*, M. J. Gordon\*\*, J. Hearne\*\*, N. I. Heringman\*\*, A. P. Hoberek\*\*, S. Karian\*\*, W. J. Kerwin\*\*, M. A. Konkle\*\*, A. C. E. Langley\*\*, E. E. Lipton\*\*, C. Okonkwo\*\*, C. Strathausen\*\*, D. Strickland\*\*, M. Townsend\*\*

**Assistant Professor** L. Gurton-Wachter\*, S. M. Harrison\*, J. Kramer\*\*, M. Marlo\*, A. Myers\*\*, A. Socarides\*\*, J. Sukys\*

**Professor Emeritus** D. Anderson, R. M. Bender, T. D. Cooke, A. J. Devlin\*, H. Fulweiler\*, C. H. Hinnant\*, R. A. Hocks\*, W. V. Holtz, W. B. Horner, T. Materer\*, L. McMahon\*, C. Parke\*, M. Patton\*, M. G. Porter, T. V. Quirk\*, J. R. Roberts, S. Santos\*, C. G. Youmans

**Associate Professor Emeritus** H. Hinkel\*, D. G. Hunt\*, G. Swan

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 179)
- BA in English (p. 179)
- Minor in English (p. 181)
- Minor in English Writing (p. 181)

## Graduate

College of Arts and Science

114 Tate Hall  
573-882-6421  
<http://english.missouri.edu>

**Director of Graduate Studies:** Samuel Cohen

- MA in English (p. 181)
- PhD in English (p. 182)

## About the Program

With more than one hundred M.A. and Ph.D students and about 500 undergraduates, we are one of the largest and most diverse departments on the Columbia campus. We offer a wide range of courses in British and American Literature and Creative Writing, as well as special emphases in African Diaspora Studies, Critical Theory, English Language and Linguistics, Folklore and Oral Tradition, and Rhetoric and Composition.

## Subject Areas

Lecture courses, seminars and directed research are available in British and American language and literature, creative writing, folklore and oral tradition, critical theory, rhetoric and composition, language and linguistics, and African diaspora studies.

## Funding

Students admitted to the graduate program usually receive a fellowship or teaching assistantship. Outstanding applicants will also be eligible to compete for a variety of college and university fellowships. The deadline for applications to both the MA and PhD programs is January 1. Announcements of awards are made by early April.

## Publications Experience

Students will also have the opportunity to assist faculty in editing *The Missouri Review*, a nationally recognized journal of fiction, poetry and essays; *Oral Tradition*, the only journal involved in the comparative study of oral traditions; *The Eighteenth Century Novel*; and *The Journal for Early Modern Cultural Studies*.

## Undergraduate

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## Department Level Requirements - English

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### Departmental Honors

To graduate with honors in English, students must have a cumulative GPA of 3.3 and a GPA of 3.5 in English courses and successfully complete ENGLSH 4996 and ENGLSH 4995. Students wishing to enroll in these courses must complete an application process in January of their junior year. More information is available from the Director of Undergraduate Studies.

## BA in English

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### Major Program Requirements

English majors must complete 30 credits in English. A minor is recommended. At least 24 hours in the major (not including internship

hours) must be in courses numbered above 2999. Remaining hours may be either lower division or junior/senior level courses.

No more than 40 credits in English may be counted toward graduation. The required English composition credits are excluded from this maximum and must be taken before the student enrolls in any English courses numbered above 2009.

## Major Core Requirements

UNIT I		
ENGLISH 2100	Writing About Literature (p. 179)	3
UNIT II: Literature		18
At least 3 credits at the 3000+ level in each area:		
A. Beginning to 1603		
B. 1603 to 1789		
C. 1789 to 1890		
D. 1809 to the Present		
UNIT III: Folklore/Oral Literature, Language, Rhetoric, Composition, Theory and Criticism		6
UNIT IV: Capstone		3
ENGLISH 4970 Capstone Experience (p. 179)		
ENGLISH 4996 Honors Seminar in English (p. 179)		
Total Credits		

## Tracks

Students may choose an optional track in African Diaspora studies, creative writing, folklore, or language. Choosing one of these tracks increases the major requirements to 33 credits. The requirements in Units II and III (described above) are reduced by 3 credits each and a student takes 9 credits in one of the four track areas described below. (Note: Tracks do not appear on transcripts or diplomas.)

### African Diaspora track

Three of the following courses in African Diaspora studies:		9
ENGLISH 2400 Introduction to African Diaspora Literature		
ENGLISH 3400 Survey of African American Literature, Beginnings to 1900		
ENGLISH 3410 Survey of African American Literature, 1900-Present		
ENGLISH 3420 Periods and Genres in African Diaspora Literature		
ENGLISH 4400 Studies in African Diaspora Literature		
ENGLISH 4410 Major Africana Diaspora Writers		
ENGLISH 4420 Africana Womanism		
ENGLISH 4480 Major African Diaspora Women Writers		
ENGLISH 4710 Themes in African Diaspora Folklore		

### English language track

Three of the following courses in the English language:		9
ENGLISH 1060	Human Language	3
ENGLISH 4600 Structure of American English		
ENGLISH 4610 History of the English Language		
ENGLISH 4620 Regional and Social Dialects of American English		
ENGLISH 4630 Phonology		

ENGLISH 4640 Syntax

ENGLISH 4650 Principles of Teaching English as a Second Language

ENGLISH 4670 Field Methods in Linguistics

### Creative writing track

Three courses in creative writing in fiction, creative nonfiction, playwriting, or poetry: 9

#### Fiction:

ENGLISH 1510 Creative Writing: Introduction to Fiction & ENGLISH 2510 and Creative Writing: Intermediate Fiction & ENGLISH 4510 and Creative Writing: Advanced Fiction

#### Nonfiction:

ENGLISH 1520 Creative Writing: Introduction to Nonfiction Prose & ENGLISH 2520 and Creative Writing: Intermediate Nonfiction Prose & ENGLISH 4520 and Creative Writing: Advanced Nonfiction Prose

#### Playwriting:

ENGLISH 2560 Beginning Playwriting & ENGLISH 3560 and Intermediate Playwriting and Advanced Playwriting: Problems & ENGLISH 4560

#### Poetry:

ENGLISH 1530 Creative Writing: Introduction to Poetry & ENGLISH 2530 and Creative Writing: Intermediate Poetry and Creative Writing: Advanced Poetry & ENGLISH 4530

### Folklore track

Three of the following courses in folklore and oral tradition: 9

ENGLISH 1700 Introduction to Folklore Genres  
ENGLISH 2700 Introduction to Folklore Field Research  
ENGLISH 2770 Introduction to Oral Literature  
ENGLISH 3700 American Folklore  
ENGLISH 4700 Special Themes in Folklore  
ENGLISH 4770 Oral Tradition  
ENGLISH 4780 Women's Folklore and Feminist Theory

The folklore student also takes a minimum of three courses in associated fields outside the English Department (such as anthropology, linguistics, art history, or classics). These courses can be used to fulfill general requirements in the College of Arts and Science.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000*	3	MATH 1100*	3

Foreign Language <sup>**</sup>	5	Foreign Language <sup>**</sup>	5
Behavioral Science Course <sup>*</sup>	3	Social Science Course <sup>*</sup>	3
American History OR Government Course	3	Humanities/Fine Arts Course <sup>*</sup>	3
IS_LT 1111	1	Elective Course	1
	<b>15</b>		<b>15</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ENGLISH 2100 <sup>^</sup>	3	ENGLISH 2300 <sup>^</sup>	3
Biological/Physical Science Course w/lab <sup>*</sup>	5	Biological/Physical/Mathematical Science Course w/lab <sup>*</sup>	4-5
Foreign Language <sup>**</sup>	3	Behavioral Science Course 2000+ <sup>*</sup>	3
Humanities/Fine Arts Course <sup>*</sup>	3	Social Science Course <sup>*</sup>	3
		Elective or Course for Minor	3
	<b>14</b>		<b>16-17</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
Humanities Course 2000+ <sup>**</sup>	3	ENGLISH 4166 <sup>^</sup>	3
ENGLISH 3210 <sup>^</sup>	3	ENGLISH 4600 <sup>^</sup>	3
ENGLISH 4310 <sup>^</sup>	3	Elective or Course for Minor 3000+	3
Elective or Course for Minor	3	Elective or Course for Minor	3
Humanities/Fine Arts Course <sup>**</sup>	3	ENGLISH 3410 <sup>^</sup>	3
	<b>15</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ENGLISH 4700 <sup>^</sup>	3	ENGLISH 4970 <sup>^</sup>	3
ENGLISH 4240 <sup>^</sup>	3	Elective or Course for Minor 3000+	3
Elective or Course for minor 2000+	3	ENGLISH 4260	3
Second Depth Area Course 2000+ <sup>**</sup>	3	Elective or Course for Minor	3
Humanities/Depth Area Course 2000+ <sup>**</sup>	3	Second/Third Depth Areas Course 2000+	3
	<b>15</b>		<b>15</b>
Total Credits: 120-121			

\* Course concurrently meets University General Education, Arts and Science Foundation and/or campus graduation requirements.

<sup>^</sup> Course meets degree requirements or major requirements.

Depth Areas are courses that are 2000 level or above chosen from four areas, the sciences, social sciences, behavioral sciences or humanities and fine arts. Arts and Science students are required to complete 9 hours in at least 2 of the four areas.

## Minor in English

The English minor consists of 15 credits beyond the university composition requirement. It must include at least 6 credits in courses numbered 3000 or above and may include no more than 6 credits in special problems, methods, or readings courses such as ENGLISH 4955 and ENGLISH 4960. No more than 6 hours of transfer credit will be applied to the minor. The minor is a flexible and varied program that can

be tailored to individual students' needs. Students wishing to minor in English should consult the English Department's undergraduate advisor.

## Minor in English Writing

The writing minor is a 15-credit course of study designed to help students in all majors and colleges improve their writing and critical thinking skills. It requires writing courses specified by the department, including 6 credits in courses numbered 3000 or above. No more than 6 hours of transfer credit will be applied to the minor. Consult the English Department undergraduate advisor for specific requirements.

## Graduate

### MA in English

#### Admission Contact Information

Victoria Thorp [thorpv@missouri.edu](mailto:thorpv@missouri.edu)  
 114A Tate Hall, Department of English  
 Columbia, MO 65211  
 573-882-4676

#### Admission Criteria

Fall deadline: January 1

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE score: not set
- Minimum GPA: 3.0 overall, higher in courses in major
- Majored in English as an undergraduate, with at least 18 hours in upper division courses in literature or linguistics. Students with other undergraduate majors may be admitted provided their background in English studies is suitable and provided they complete an appropriate course of preliminary study. Promising students who do not meet one or more of these criteria may at the discretion of the director of graduate studies be encouraged to enroll as non-degree graduate students.

#### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the English Program* (<http://english.missouri.edu/graduate-program/application-process-and-materials.html>):

- English Department application form
- GRE scores; The general test is required. Students are also welcome to submit subject test scores, and strongly encouraged to do so if their previous work is in a field other than English.
- 3 letters of recommendation (use departmental form)
- Official transcripts
- Statement of purpose
- 2 10-20 page critical/scholarly papers (1 for creative writing applicants)
- Creative writing applicants: also submit a sample of your fiction (30 pages) and/or poetry (20 pages) or a one-act play
- Supplementary information sheet (for MA/PhD and PhD track applicants only)

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Plan of Study

The MA is a 4-semester (2-year) program with 30 hours of course work (at least 15 hours at the 8000-level) in English.

- MA students may take up to 6 hours (7000-level or above) outside the English department.
- In addition to literary study, students may also select from among the 6 emphasis areas to accompany the program in British and American Literature: African Diaspora Studies, Creative Writing, Critical Theory, Folklore and Oral Tradition, Language and Linguistics, and Rhetoric and Composition.
- A foreign language is not required for the master's degree.

## Final Assessment Options

A student may elect to write an MA thesis (while taking 6 hours of English 8090), to present a portfolio and take an oral exam, or to take a written comprehensive exam based on a reading list.

## Thesis

Students who choose the MA thesis (50-75 pages) should, at the outset of master's work, discuss possible thesis topics with the faculty member or members who seem most likely to constitute the student's MA Thesis Committee (two English department members and one outside member). Students present and defend their theses to this committee in an oral examination.

## Portfolio/Oral Exam

Students electing this option will choose two faculty members to work with in revising two essays previously written during their M.A. work. The Director of Graduate Studies, in consultation with the student, will choose a third faculty member to serve on the student's portfolio committee. Students will defend the two revised essays, as well as those not chosen for revision, in a two-hour oral exam. The committee may pass or fail the examinee on any part(s) of the portfolio. In the case of partial or total failure, the student will retake the oral portions that were failed and may need to revise further one or both of the revised essays.

## Written Exam Based on Reading List

The exam consists of three questions answered over a four-hour time period. Students in Literature and in Literature with a Creative Writing Emphasis are assigned to a three-member M.A. Comprehensive Exam Committee and write on three literature-based questions. Students with emphases in African Diaspora, Critical Theory, English Language & Linguistics, Folklore & Oral Tradition, or Rhetoric & Composition are assigned to a committee that includes two members from literature and one member from the emphasis area. They write two literature-based questions and one emphasis-area-based question.

## Satisfactory Progress

The Department of English expects all candidates to make satisfactory progress toward completing their graduate degrees. The MA should be completed within three calendar years after matriculation. No grades of C

will be counted toward the completion of the required number of hours for the MA.

## MA/PhD Track

The department also offers an MA in an MA/PhD program intended for especially well-prepared students who have BA degrees and know they wish to pursue the PhD. It offers enhanced financial aid and an accelerated time to degree. Students complete MA requirements and begin taking PhD course work in their second year in the program. Academic requirements for the two degrees are identical with the academic requirements for the separate MA and PhD degrees.

## PhD in English

### Admission Contact Information

Victoria Thorp [thorpv@missouri.edu](mailto:thorpv@missouri.edu)  
Department of English  
114A Tate Hall, Columbia, MO 65211  
573-882-4676

### Admission Criteria

Fall deadline: January 1

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE score: not set
- MA in English or its equivalent

### Required Application Materials

*To the Graduate School*

- All required Graduate School documents

*To the English Program* (<http://english.missouri.edu/graduate-program/application-process-and-materials.html>):

- English department application form
- GRE scores; The general test is required. Students are also welcome to submit subject test scores, and strongly encouraged to do so if their previous work is in a field other than English.
- 3 letters of recommendation (use departmental form)
- Official transcripts
- Statement of purpose
- 2 10-20 page critical/scholarly papers (1 for creative writing applicants)
- Creative writing applicants: also submit a sample of your fiction (30 pages) and/or poetry (20 pages) or a one-act play
- Supplementary information sheet

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Plan of Study

The PhD is a 5-year program with 30 hours of course work beyond the MA. At least 18 hours in English must be taken at the 8000-level

(English 8095 and 9090 do not count toward the 18-hour requirement). Candidates with insufficient background in English may be required to take additional hours upon the recommendation of the advisory committee.

A student may elect one English 8000 problems course (a maximum of three hours of credit), with the prior consent of the director of graduate studies. A minimum of 18 hours of course work beyond the MA (excluding research hours) must be taken in residence at the Columbia campus in order for the candidate to be eligible for a PhD from the University.

## Language Requirement

PhD students should determine how they will fulfill the departmental language requirement in consultation with their faculty advisor and other committee members, since different projects and different areas of study will require different levels of language proficiency. A student's committee can always recommend that the student pursue language study above and beyond the level required by the departmental language requirement for the purpose of their chosen dissertation project.

However, the purpose of the foreign language requirement is to ensure that all students have at least an awareness of their entrance into an international community of scholars and scholarship and ideally an ability to read literature and critical studies in other languages. Although simple fulfillment of the language requirement may not guarantee fluency in another language or culture, it should prepare students to read primary texts related to their fields and equip them with skills to conduct scholarly research on important secondary literature. To this end, the department is committed to the principle that all doctoral students who plan to study language and literature benefit from exposure to another language or languages.

A student may satisfy the foreign language requirement for the PhD in English by demonstrating either 1) basic proficiency in two foreign languages or 2) advanced proficiency in one foreign language.

To demonstrate basic proficiency the student must pass with a grade of B or better a) the intensive introduction to a language or b) the three-semester introductory sequence or c) one course at or beyond the third semester level in the language chosen or the equivalent of these courses elsewhere. The courses must have been completed or the examinations taken not more than five years prior to the candidate's enrollment in the PhD program. Because not all languages are taught using this format at the University of Missouri, students have the option to demonstrate basic proficiency in one of their two chosen languages by taking an introductory course in another language that is relevant to their research. A student who wishes to obtain this exemption must submit a letter, signed by the student and the chair of his or her committee, explaining why the course is relevant to his or her program of doctoral study. This exemption will be granted only for University of Missouri courses taken during the student's official degree program. Courses taken at another institution, or before the student begins the degree program, are not eligible for this exemption. Students cannot request this exemption for languages taught at MU using the regular structure outlined above (i.e., in a 3-course introductory sequence or a one-semester intensive introduction).

To obtain advanced proficiency the student must either a) pass with a grade of B or better two upper class undergraduate courses (3000- or 4000-level, or the equivalent elsewhere) in the literature of the language chosen or b) pass with a grade of B or better one graduate class (7000- or 8000-level, or the equivalent elsewhere) in the literature of the language chosen. These courses may not be in translation, and any

graduate course in a modern language must be taught in that language. Overall, the department recommends taking a graduate-level course as the best option for students who are able to do so, since such courses can also count towards the nine hours of non-English department coursework that PhD students can include in their program of study. Undergraduate language courses (4000-level or below) do not count towards graduate study at the University of Missouri.

The director of graduate studies will work with students to try to arrange for testing for students with proficiency but without course work in an acceptable language (for instance, those who have lived in another country for an extended period of time). This option, and all other exceptions to the language requirement described above, are contingent upon 1) the student's ability to demonstrate a substantial connection between the language in question and his or her program of study and 2) consent of the student's advisor.

## Doctoral Committee

By the end of the first year, doctoral students must meet with their advisers to organize a doctoral committee. Students meet with this committee to plan course work and define their primary and secondary fields of study. This meeting satisfies the graduate school requirement for a PhD qualifying examination.

## Comprehensive Examination

After all course work, the foreign language requirement and the residency requirement have been completed, the student takes the PhD comprehensive examination. This exam consists of a written section (the Preparatory Essay) and a two-and-a-half hour oral exam. For the comprehensive examination to be successfully completed, the doctoral program committee must vote to pass the student on the entire examination, both written and oral sections, with no more than one dissenting or abstaining vote. If a student fails either part of the exam, he or she will be allowed to retake that part. No student will be allowed to take any part more than twice. All doctoral candidates should realize that no comprehensive exam is limited to the candidate's course work.

## Dissertation

As soon as possible after passing the comprehensive examination, a candidate should explore a dissertation topic under the guidance of the student's adviser. The doctoral dissertation is written under the direction of a member of the doctoral faculty at MU.

## Creative Dissertation Option

The PhD candidate may choose to write a creative dissertation, which may take the form of a novel, a novella, a book-length collection of short fiction or a collection of poetry. To exercise this option, the candidate must have taken 9 to 12 hours of creative writing seminars as part of the PhD course work.

In addition to the "creative" part of the dissertation, the candidate will compose a prose introduction (2,500- word minimum), to be written after completion of the creative project, to demonstrate the correspondence between the candidate's academic studies and the creative project. The overall length required would be comparable with that of other dissertations approved by the department.

## Satisfactory Progress

The Department of English expects all candidates to make satisfactory progress toward completing their graduate degrees. The comprehensive

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exam should be completed within five calendar years after matriculation, and the PhD should be completed within five calendar years after passing the comprehensive exam. No grades of C will be counted toward the completion of the required number of hours for the PhD.



## Film Studies

Roger Cook, Program Director  
 Interdepartmental Program in the College of Arts and Science  
 451 Strickland  
 (573) 882-9452  
 cookrf@missouri.edu  
 filmstud@missouri.edu

The Film Studies Program offers a major that focuses on film analysis and covers the history of cinema, national and global cinemas, film theory and genres, documentary film, and contemporary visual culture. As a classic liberal arts discipline, film studies teaches the fundamental skills that make a college degree essential in career-oriented jobs: research, information management, critical analysis, cogent development of ideas, developing and testing of hypotheses, and writing and communication. It combines an emphasis on critical thinking, research, problem-solving, written expression, and cultural literacy with the discipline's unique attention to visual analysis. Students emerge with a greater degree of visual literacy at a time when our culture is becoming increasingly dependent upon visual communication. As a complement to the main focus on the critical study of film, the program also offers some production courses and occasional opportunities to participate in filmmaking projects. For those who want to pursue a career in the TV/ motion picture or the fast-growing digital media industry the major provides a strong foundation that can be combined with the learning of specific industry skills.

The program offers a BA degree in film studies as well as an undergraduate minor.

## Faculty

**Professor** G. Barabtarlo\*, R. F. Cook\*, R. N. Johnson\*, J. M. Miller, A. Prahlad\*, N. M. West\*

**Associate Professor** M. H. Carver, R. Dingo\*, J. Draper\*, J. Hearne\*, S. Ireton\*, V. M. Kaussen\*, W. Kerwin\*, K. Kopp\*, B. Prager\*, C. Strathausen\*

**Assistant Professor** R. Tabanelli\*

**Associate Teaching Professor** M. H. Barnes\*, N. Monnier\*,

**Assistant Teaching Professor** E. Wilson, E. Hornbeck, E. Naveh-Benjamin, M. Volz

**Instructor** L. Dickinson, C. Gubera, B. Maurer, L. Roth, R. Wise

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 185)
- BA in Film Studies (p. 185)
- Minor in Film Studies (p. 186)

## Graduate

While MU does not offer graduate degrees specifically in film studies, the University does offer post-baccalaureate opportunities in a number of related areas, both within the College of Arts and Science, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

### Department Level Requirements - Film Studies

#### Double and Dual Majors

A film studies major can be paired with a major in another department. Students must meet the requirements of both departments. The program for each major must be approved by the advisor in the degree-granting department.

#### Departmental Honors

To receive departmental honors, a student must earn a minimum overall MU GPA of 3.3 and a minimum GPA of 3.5 in courses in film studies completed at the University of Missouri. In addition, with the assistance of an honors thesis advisor, the student must develop, plan and conduct research on an independent project, normally while enrolled in FILM\_S 4995.

## BA in Film Studies

### Major Program Requirement

Film Studies majors must complete 30 credits in film studies, with a grade of C- or above in every course. A minor is recommended. At least 15 hours in the major must be in courses at the 3000 level or above. Students must also complete College of Arts and Sciences and University requirements, including University general education (p. 18) requirements. No more than 40 credits in Film Studies may be counted toward graduation.

The 30 hours of Film Studies courses for the major must meet the following requirements:

#### Major core requirements

<b>UNIT I:</b>		
FILM_S 1800	Introduction to Film Studies	3
<b>UNIT II:</b>		
FILM_S 2820	Trends in World Cinema	3
Select one of the following: 3		
FILM_S 2830	American Film History I, 1895-1950	
FILM_S 2840	American Film History II, 1950-Present	
<b>UNIT III:</b>		
Electives		18

At least six of the elective hours must come from one of the following national cinema courses:

FILM_S 2850	Italian Cinema
FILM_S 2865	The Art of Soviet and Russian Cinema

FILM_S 3830	History of German Film
FILM_S 3840	German Film After 1945
FILM_S 3845	Modern Israeli Film
FILM_S 3870	Russian Women and Film
FILM_S 3875	Brazilian Cinema
FILM_S 3880	Contemporary Chinese Film
FILM_S 3890	Russian and Soviet Film
FILM_S 3895	Korean Society Through Cinema

At least six of the elective hours must come from one of the following courses on theory and method:

FILM_S 2860	Film Themes and Genres
FILM_S 2870	Film and Literature
FILM_S 3775	The Ancient World on Film
FILM_S 3780	Architecture in Film
FILM_S 3785	Art and Artists on Film
FILM_S 3820	Major Directors
FILM_S 3850	Studies in Film History
FILM_S 3855	Documentary Film
FILM_S 3861	Film Themes and Genres
FILM_S 4810	Film Theory
FILM_S 4820	Studies in Film Genre
FILM_S 4840	Culture and Media
FILM_S 4860	Film Themes and Genres
FILM_S 4935	Adaptation of Literature for Film

#### UNIT IV:

Select one of the following:	3
FILM_S 4880 Capstone Experience	
One 4000-level FILM S course of at least 3 credits	
<b>Total Credits</b>	<b>30</b>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

First Year			
Fall	Credits	Spring	Credits
FILM_S 1800	3	FILM_S 2840	3
ENGLISH 1000	3	Foreign Language	5
Social Science (MO State Law)	3	MATH 1100	3
Foreign Language	5	General Elective	3
	<b>14</b>		<b>14</b>
Second Year			
Fall	Credits	Spring	Credits
FILM_S 2820	3	FILM_S 2000+ (National Cinema Course)	3
Science with a Lab	5	Minor Course	3
Foreign Language	3	Humanities/Fine Arts (Writing Intensive)	3
Behavioral Science	3	Behavioral Science	3

Social Science	3	Science Course	3
	<b>17</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
FILM_S 2000+ (Theory and Methods Course)	3	FILM_S 3000+ (Elective)	3
FILM_S 3000+ (National Cinema Course)	3	Minor Course	3
Minor Course	3	Humanities/Fine Arts	3
Humanities/Fine Arts	3	Social Science Course	3
Science Course (Math Reasoning Proficiency)	3	General Elective Course	3
	<b>15</b>		<b>15</b>
Fourth Year			
Fall	Credits	Spring	Credits
FILM_S 3000+ (Theory and Methods Course)	3	FILM_S 4000 Level (Capstone)	3
FILM_S 3000+ (Elective)	3	Minor Course	3
Minor Course	3	Humanities/Fine Arts	3
Writing Intensive Course 3000+	3	General Elective Course	3
General Elective Course	3	General Elective Course	3
	<b>15</b>		<b>15</b>
Total Credits: 120			

## Minor in Film Studies

To earn a minor in Film Studies, students must earn 15 credits in film studies. Required courses include FILM\_S 1800, and either FILM\_S 2830 or FILM\_S 2840. At least two courses must be at the 3000 level or above. The minor is a flexible and varied program that can be tailored to individual students' needs. Students wishing to minor in film studies should consult the film studies advisor.

## General Studies

Office of Special Degree Programs  
 College of Arts and Science  
 114 Switzler Hall  
 (573) 882-6060

### Faculty

**Professor T. Tarkow**

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 187)
- BGS in General Studies (p. 187)

The Bachelor of General Studies (BGS) is designed for students who want a multi-disciplinary major to meet educational and career objectives. Students who pursue the BGS need a high degree of motivation and independence. The BGS is intended for students pursuing a first bachelor's degree and will not be approved as a second bachelor's degree.

### Graduate

While the College of Arts & Science does not offer a graduate degree in general studies, the College does offer graduate degrees, certificates and minors in a number of disciplinary areas. The catalog provides a complete list of these degree options (p. 5) for all Schools and Colleges at the University of Missouri.

## Undergraduate

### Department Level Requirements - General Studies

The BGS degree requires a minimum of 120 credit hours with a minimum of 30 credit hours numbered 3000 or above. Students meet with the academic advisor to create a graduation plan after completing 60 credit hours, MATH 1100 (p. 187) or an equivalent with a C- grade or higher, ENGLISH 1000 (p. 187) with a C- grade or higher and maintaining a 2.0 cumulative GPA.

BGS students are required to complete 24 credit hours as declared BGS majors and this may include credit for the semester in which the student declares the BGS major. In exceptional circumstances students who need fewer than 24 credit hours to complete all their BGS, A&S and MU requirements must take a minimum 3 credit hour BGS capstone course.

## BGS in General Studies

### Major Program Requirements

Students must complete the Department Level Requirements (p. 187) as well as those required for the degree listed below:

The BGS major requires 45 credit hours, including a capstone. These 45 credit hours are evenly distributed among three areas of study called components. A component may be made up of courses from a single department or may be made up of courses from multiple departments that relate thematically. Component courses may be selected from any department or program at MU (if the department permits), but at least 18 credit hours must be made of courses from an A&S department. Of the 15 credit hours required for each component, 6 credit hours in each of the components must be numbered 3000 or higher. Students must maintain a GPA of 2.0 in each component area and grades of D are not acceptable. A student may include one component made entirely of transfer coursework if the other two components each contain 9 credit hours of coursework numbered 3000 or above. BGS students are required to include a minimum of 12 credit hours of MU coursework numbered 3000 level or above in their three components.

- 30 of the last 36 hours a student completes must be taken at MU.
- In order to graduate, students must have the following GPAs:
  - 2.0 cumulative GPA (the GPA for all coursework taken at MU)
  - 2.0 major GPA (the GPA for all courses taken to fulfill requirements in the major)
  - 2.0 minor GPA (the GPA for all courses taken to fulfill requirements for a minor)
  - 2.0 GPA in the final 60 hours
  - 2.0 GPA in the final 30 hours

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
Behavioral Science 1000+	3	Science 1000+	3
Social Science (MO STATE LAW) 1000+	3	Behavioral & Social Sciences 1000+	3
Humanities or Fine Arts 1000+	3	Humanities & Fine Arts 1000+	3
BGS Component #1 1000+	3	BGS Component #2 1000+	3
	15		15
Second Year			
Fall	Credits	Spring	Credits
Science with a lab 1000+	3-5	Math Reasoning Proficiency	3
Writing Intensive I 1000+	3	Behavioral & Social Sciences 2000+	3
Humanities & Fine Arts 2000+	3	BGS Component #1 2000+	3
BGS Component #3 1000+	3	BGS Component #2 2000+	3
		BGS Component #3 2000+	3
	12-14		15

<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
Any Arts & Science 2000+	3	BGS Component #1 3000+	3
BGS Component #1 3000+	3	BGS Component #2 3000+	3
BGS Component #2 3000+	3	BGS Component #3 3000+	3
BGS Component #3 3000+	3	Writing Intensive II 3000+	3
General Elective or Minor 1000+	3	General Elective or Minor 2000+	3
	<b>15</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
BGS Component #1 4000+ CAPSTONE	3	General Elective or Minor 1000+	3
BGS Component #2 3000+	3	General Elective or Minor 1000+	3
BGS Component #3 3000+	3	General Elective or Minor 1000+	3
General Elective or Minor 1000+	3	General Elective or Minor 1000+	3
General Elective or Minor 1000+	3	General Elective or Minor 1000+	3
General Elective or Minor 1000+	2-3		
	<b>17-18</b>		<b>15</b>
Total Credits: 119-122			

## Geography

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Joseph J. Hobbs, Chair  
College of Arts and Science  
8 Stewart Hall  
(573) 882-8370  
geog@missouri.edu

### Faculty

**Professor** J. J. Hobbs\*

**Associate Professor** M. W. Foulkes\*, S. C. Larsen\*, M. A. Urban\*

**Assistant Professor** G. Elliott\*, T. Matisziw\*, M. Palmer\*

**Assistant Teaching Professor** L. G. Brown\*

**Instructor** C. Blodgett, T. L. Haithcoat, J. D. Harlan, T. Vought, S. White\*

**Professor Emeritus** C. L. Salter\*

**Associate Professor Emeritus** G. S. Ludwig\*, W. A. Noble, W. A. Schroeder\*

**Adjunct Professor** C. H. Davis, W. R. Elliot, R. B. Jacobson\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 190)
- BA in Geography (p. 190)
  - with emphasis in General Geography (p. 191)
  - with emphasis in Geographic Information Sciences (p. 191)
  - with emphasis in Regional/Cultural (p. 191)
  - with emphasis in Physical/ Environmental (p. 191)
  - with emphasis in Urban/Population (p. 192)
- Minor in Geography (p. 192)
- Minor in Geographic Information Science (p. 192)
- Certificate in Geographic Information Science (p. 192)

The Department of Geography has established the following goals for the Bachelor of Arts with a major in Geography:

- Teach students to think spatially and develop problem solving skills
- Provide an intellectual focus for students seeking a broadly based liberal arts education
- Acquaint students with past and present patterns of landscape development and instill concern for intelligent management of earth's biophysical resources
- Expose students to contemporary issues of geopolitical and international significance and their role in such problems
- Provide the skills and expertise necessary to master the application of geographic information technologies and analysis of spatial data
- Prepare motivated students for career development and graduate study

Four different emphasis areas allow students to further focus the undergraduate degree program on their own personal interests in geography.

1. Human-Regional-cultural geography helps students develop a fuller sense of geographic analysis and better understanding of the human and physical characteristics of major regions and settlement patterns of the world.
2. Physical-environmental systems emphasize the complex interactions between biophysical systems and human behavior in the areas of geomorphology and biogeography, as well as our role in managing applied environmental problems.
3. Geographic information sciences addresses the variety of technologies revolutionizing geographic analysis such as GIS, GPS, remote sensing, computer assisted cartography and spatial statistics.
4. General geography is designed for the student with broad interests in geography that overlap with other emphasis areas.

For students planning to end their formal education with the bachelor's degree, a geography major provides marketable skills and the broad perspectives on environment, society and international affairs that enable graduates to move beyond entry-level positions. Geography also provides a sound foundation for students who plan to enter graduate work in a variety of fields, from geography to business, land use planning, law and medicine. Although positions are not often designated with the title of geographer, geography graduates' employment has grown substantially in private enterprise and in all levels of government in recent years.

The Department offers BA and MA degrees with majors in geography as well as undergraduate and graduate certificates in Geographic Information Science and Geospatial Intelligence. Two minors are also available.

### Graduate

College of Arts and Sciences  
8 Stewart Hall  
573-882-8370  
<http://www.geog.missouri.edu/>

**Director of Graduate Studies:** Soren Larsen

- MA in Geography (p. 192)
- Graduate Certificate in Geographical Information Science (p. 193)

### About Geography

The Department of Geography offers a Master of Arts degree that prepares students for a variety of professions, including careers in academics, research, public service, and the private sector. The MA program has a high success rate of preparing students for doctoral study in top-tier geography departments across the United States.

A primary strength of the department is the blending of major research facilities and opportunities with individual student-faculty interaction to build a strong sense of community. Students interested in questions of human geography, the physical environment, or geographic information sciences will find that the department has facilities and faculty expertise to build a successful plan of study.

Core areas of study in the department include human geography, nature/society relationships, physical-environmental systems, and application

of geographic information sciences. The faculty has an active program of research and field work in North America, Middle America, the Middle East and Southeast Asia. They pride themselves on a creative instructional and interdisciplinary pattern of activity. The department emphasizes close contact between faculty and graduate students.

Individualized graduate programs allow latitude in areas of specialization such as regional, cultural, and physical geography, as well as geographic information sciences, remote sensing, environmental studies and geographic education. Strong collateral course work in such fields as anthropology, soil and atmospheric science, economics, geology, political science, forestry, computer science and history meets the special interests of many graduate students.

## Facilities and Resources

An exceptional departmental collection of reference materials, including maps, journals and books, is available to graduate students in the department's Wheeler Library and Seminar Room. The holdings of Ellis Library in geography and related fields are extensive and MU's computer facilities are readily available. In addition, the department is home to the Geographic Resources Center (GRC), the Missouri Spatial Data Information Service and the Spatial Analysis and Modeling teaching laboratory. These facilities serve as an interdisciplinary center for GIS, remote sensing, cartography, computer graphics and digital spatial databases of enormous variety.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details. In Geography, a total of approximately 6 graduate teaching and research assistantships are awarded on a competitive basis annually. Applicants desiring consideration for one of these positions should indicate this in their application to the department.

## Undergraduate

### Department Level Requirements - Geography

#### Departmental Honors

The geography honors program requires independent research during the senior year, usually under GEOG 4996H or GEOG 4997H. Consult the geography honors director for further information.

### BA in Geography

**Director of Undergraduate Studies:** Douglas Hurt

### Major Program Requirements

Students majoring in geography are required to take a total of 33 credits in geography and 3 in statistics. The geography courses consist of 21 core credits and at least 12 credits in one of the five geography emphasis areas. In addition, students must complete all degree, College of Arts and Sciences and University requirements (p. 17) including University general education (p. 18).

## Major core requirements

GEOG 1100	Regions and Nations of the World I	3
or GEOG 1200	Regions and Nations of the World II	
GEOG 1550	Introduction to the Humanized Earth	3
GEOG 1800	Digital Earth: Introduction to the Geospatial Technologies	3
GEOG 2610	Climate, Landforms and Vegetation: Introduction to Physical Geography	3
GEOG 3840	Cartography	3
GEOG 4990	Senior Seminar in Geography	3
Statistics: Select one of the following		3
STAT 1200	Introductory Statistical Reasoning	
STAT 1300	Elementary Statistics	
Or Higher		
<b>Total Credits</b>		<b>21</b>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

First Year			
Fall	Credits	Spring	Credits
ENGLSH 1000 *	3	MATH 1100 *	3
GEOL 1100 *	4	GEOG 1200 ^	3
GEOG 1100 ^	3	GEOG 2610 ^	3
Foreign Language *	5-6	Foreign Language *	5-6
GEOG 1550	3		
	<b>18-19</b>		<b>14-15</b>
Second Year			
Fall	Credits	Spring	Credits
Foreign Language *	3	Behavioral Science Course *	3
Social Science Course (MO State Law) *	3	Behavioral Science Course *	3
Elective/Minor Course	3	Writing Intensive Course *	3
GEOG 1800	3	GEOG 1550	3
GEOG 2710	3	GEOG 3840 ^	3
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
Biological/Physical Science Course *	3	GEOG 4810 ~	3
GEOG 3040	3	Humanities/Fine Arts Course *	3
GEOG 3610	3	Social Science Course (2000+) *	3
Social Science Course (2000+)	3	Humanities/Fine Arts Course (2000+) *	3
Social Science Course *	3	Biological/Physical Science Course with Lab	3-5

	Elective/Minor Course (3000+)		
	15		15-17
Fourth Year			
Fall	Credits	Spring	Credits
Humanities/Fine Arts Course *	3	GEOG 4940~	3
GEOG 3830	3	GEOG 4990^	3
STAT 1200 or 1300	3	Elective/Minor Course	3
Elective/Minor Course (3000+)	3	Humanities/Fine Arts Course (2000+)*	3
Elective/Minor Course	3	Elective/Minor Course (3000+)	3
	15		15
Total Credits: 122-126			

\* Denotes General Education and A&S Foundation Requirements

^ Denotes Degree Program Requirements

~ Denotes Emphasis Area Requirements

## BA in Geography with Emphasis in General Geography

### Major Program Requirements

This area is designed for students with a broad interest in geographical studies. Due to the general nature of this emphasis area, students must develop in consultation with their advisor a personal plan of study outlining specific goals and course requirements. Four geography courses are required.

### Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in Geography with Emphasis in Geographic Information Sciences

### Major Program Requirements

This area allows students to develop technical skills central to the discipline of geography and spatial analysis, acquiring skills in the graphical display of geographical data and the ability to produce or analyze such data. Students must take four of the following courses:

GEOG 3040	Introduction to Geographic Information Systems GIS	3
GEOG 3830	Remote Sensing	3
GEOG 4130	The Geospatial Sciences in National Security	3
GEOG 4710	Spatial Analysis in Geography	3
GEOG 4740	Location Analysis and Site Selection	3
GEOG 4790	Geographic Information Systems for the Social Sciences	3
GEOG 4810	Landscape Ecology and GIS Analysis I	3

GEOG 4860	Advanced Remote Sensing	3
GEOG 4940	Advanced Geographic Information Systems (GIS II)	3

### Semester Plan

Refer to the Semester Plan for the BA in Geography (p. 190).

## BA in Geography with Emphasis in Physical/ Environmental

### Major Program Requirements

This area emphasizes the study of biophysical environmental processes, environmental change, environmental management, and human modification of the environment. It is intended for students interested in understanding the biophysical environment and the ways in which humans interact with it. Students must take four of the following courses:

GEOG 1050	Introductory Meteorology	3
GEOG 1600	Climate Change: Science and Public Policy	3
GEOG 2660	Environmental Geography	3
GEOG 3600	Climates of the World	3
GEOG 3610	Physical Geography of the United States	3
GEOG 3630	Earth Surface Systems	3
GEOG 4620	Biogeography: Global Patterns of Life	3
GEOG 4630	River and Stream Dynamics	3
GEOG 4810	Landscape Ecology and GIS Analysis I	3

### Semester Plan

Refer to the Semester Plan for the BA in Geography (p. 190).

## BA in Geography with Emphasis in Regional/ Cultural

### Major Program Requirements

This area focuses on both the spatial attributes of culture and the interaction between culture and environment. It is intended for prospective secondary school teachers, journalists and business and government workers. Students must take four of the following courses:

GEOG 2120	United States and Canada	3
GEOG 2130	Geography of Missouri	3
GEOG 2210	Geography of Europe	3
GEOG 2260	Geography of East Asia	3
GEOG 2340	South America	3
GEOG 2660	Environmental Geography	3
GEOG 3140	Mexico, Central America, and the Caribbean	3
GEOG 3270	Geography of the Middle East	3
GEOG 3290	Geography of Russia and the Newly Independent States of Eurasia	3
GEOG 3450	Geography of Africa	3
GEOG 3510	Historical Geography of North America	3

GEOG 3560	Native American Geographies	3
GEOG 3760	Geography of the World's Religions	3
GEOG 3780	World Political Geography: Patterns and Processes	3
GEOG 4560	Resources and Indigenous Peoples	3
GEOG 4770	Migration and Immigration	3

## Semester Plan

Refer to the Semester Plan for the BA in Geography (p. 190).

## BA in Geography with Emphasis in Urban/Population

### Major Program Requirements

This area focuses on topics such as competitive vs. generative growth within urban systems, urban travel behavior, the role of cities in regional development, international commodity trade flow, and the fiscal dilemmas of cities and migration behavior. It prepares students for career opportunities in fields such as transportation planning, regional development, urban environmental issues and management. Students must take four of the following courses:

GEOG 2710	Economic Geography	3
GEOG 2720	Urban Geography	3
GEOG 3040	Introduction to Geographic Information Systems GIS	3
GEOG 3780	World Political Geography: Patterns and Processes	3
GEOG 4710	Spatial Analysis in Geography	3
GEOG 4740	Location Analysis and Site Selection	3
GEOG 4770	Migration and Immigration	3
GEOG 4850	Transportation Geography	3

## Semester Plan

Refer to the Semester Plan for the BA in Geography (p. 190).

## Minor in Geographic Information Science

### Minor Program Requirements

Students may earn both the minor in geography and minor in geographic information science if the course work is unique for each minor. Students earning a major in geography may not earn the minor in geographic information systems.

### Minor in Geographic Information Science

Fifteen credits are required for the minor in geographic information science, and must include:

GEOG 1800	Digital Earth: Introduction to the Geospatial Technologies	3
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Nine hours of elective courses must be selected from the following list:

GEOG 3040	Introduction to Geographic Information Systems GIS	3
GEOG 4710	Spatial Analysis in Geography	
GEOG 4810	Landscape Ecology and GIS Analysis I	
GEOG 3830	Remote Sensing	3
GEOG 3840	Cartography	
GEOG 4860	Advanced Remote Sensing	
GEOG 4940	Advanced Geographic Information Systems (GIS II)	

Total Credits 18

Students may earn both the minor in geography and minor in geographic information science provided that the course work is unique for each minor. and GEOG 4940 can be taken as part of the GIS minor with the consent of the advisor.

## Minor in Geography

### Minor Program Requirements

Students may earn both the minor in geography and minor in geographic information science if the course work is unique for each minor. Students earning a major in geography may not earn the minor in geographic information systems.

### Minor in Geography

Fifteen credits are required for a minor in geography, nine of them numbered 2000 and above.

## Certificate in Geographic Information Science

Certificate description: Students from a wide range of disciplines will benefit from students with the theoretical, practical and technical skills that are essential for the analysis of spatial data. Learners become proficient in the use and application of GIS technologies through a flexible set of courses and hands-on experiences. The program offers the training and experience necessary to prepare for the rapidly expanding professional opportunities available in the diverse set of fields that depend on geographic information.

## Graduate

## MA in Geography

### Application and Admission Information

Admission Contact Information

Dr. Soren Larsen

Geography admission page: <http://www.geog.missouri.edu/grad/app.html>

### Admission Criteria

Fall deadline: January 15

- Minimum GPA: 3.0
- Minimum TOEFL scores:



Internet-based test (iBT)	Paper-based test (PBT)
61	500
• Minimum GRE scores:	
When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1000
On or After August 1, 2011	297

Preparation for graduate work in geography should include undergraduate courses in geography. Upon consultation with their adviser, students with insufficient background work in geography may be required to take additional undergraduate courses.

## Required Application Materials

All elements of the application including those required by the department are submitted through the Graduate School online application. For complete instructions, see <http://www.geog.missouri.edu/grad/app.html>.

*To the Graduate School:*

- All required Graduate School documents
- 3 letters of recommendation (submitted through the online application)GRE scores
- Supplemental department application (with Statement of Purpose)

## Plan of Study MA in Geography

The Master of Arts degree requires completion of 32 semester hours of course work. Two research options are available: a thesis and a non-thesis option. The non-thesis option requires the completion of a research paper. 15 or more of the 32 hours must be in courses at the 8000 level. Non-thesis candidates may take no more than 6 hours of special problems, special readings, special investigations, or research.

Every student must take GEOG 8750 and GEOG 8760, 6 additional hours of seminar-structured course work and 6 hours of course work in geographic methods.

A student's specific program of courses is selected jointly by the student and the graduate adviser, designated during the first semester in residence. All students of either option must pass a comprehensive oral examination at the end of their graduate work.

## Graduate Certificate in Geographical Information Science

Certificate description: Students from a wide range of disciplines will benefit from students with the theoretical, practical and technical skills that are essential for the analysis of spatial data. Learners become proficient in the use and application of GIS technologies through a flexible set of courses and hands-on experiences. The program offers the training and experience necessary to prepare for the rapidly expanding professional opportunities available in the diverse set of fields that depend on geographic information.

## Geological Sciences

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K. L. Shelton, Chair  
College of Arts and Science  
101 Geological Sciences Building  
(573) 882-1004  
poolers@missouri.edu

### Faculty

**Professor** M. Liu\*\*, K. G. MacLeod\*\*, P. I. Nabelek\*\*, E. A. Sandvol\*\*, K. L. Shelton\*\*, M. B. Underwood\*\*

**Associate Professor** M. Appold\*\*, R. L. Bauer\*\*, F. G. Gomez\*\*, C. A. Kelley\*\*, A. G. Whittington\*\*

**Assistant Professor** J. W. Huntley, J. Schiffbauer\*\*

**Director, Geology Field Program** M. Barquero-Molina\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 195)
- BA in Geological Sciences (p. 195)
- BS in Geological Sciences (p. 196)
- Minor in Geological Sciences (p. 197)

The Department of Geological Sciences offers two undergraduate degree programs, a Bachelor of Arts with a major in Environmental Geology and a Bachelor of Science with major in Geological Sciences. The BA is geared to those students interested in environmental concerns, while the BS is geared toward the traditional fields of geology. Both degrees provide a rigorous background in earth sciences. In addition, students majoring in other departments can minor in geological sciences.

### Graduate

College of Arts and Science  
101 Geological Sciences Building  
573-882-6785  
<http://geology.missouri.edu/index.html>

**Director of Graduate Studies:** Robert Bauer

- MS in Geology (p. 197)
- PhD in Geology (p. 197)

### About the Geological Sciences Program

The areas of research covered by faculty are broad and diverse, with strong research expertise in the general areas of geochemistry, petrology, paleontology, and geophysics-tectonics. These strengths allow us to focus on problems identified by the National Research Council to be socially relevant and to be fundamental to an understanding of earth processes. Dynamic faculty, along with their students, are making significant contributions to numerous areas of basic and applied research. This research is supported by excellent, state-of-the-art

analytical facilities in the department and on campus. Our graduate program prepares students for a wide range of professions within the geological sciences; students have been placed in private, federal, state, and academic institutions. Prospective students are encouraged to contact any faculty member directly for additional information.

### Areas of Specialization

The areas of specialization are biogeochemistry, clay mineralogy, aqueous and isotope geochemistry, geophysics, hydrogeology, igneous petrology, metamorphic petrology, paleontology, ore deposits, invertebrate paleontology, sedimentation, stratigraphy, structural geology, tectonics, and paleoclimatology.

### Facilities and Resources

Adequate space and excellent facilities are available for research in the Geological Sciences Building, which also houses an excellent geology library. Modern and sophisticated equipment is available for supervised student use in many fields. The Geology Field Camp is in the Wind River Mountains near Lander, Wyoming. See the Department website at <http://geology.missouri.edu/index.html>.

### About the Degrees

The master's degree program includes a thesis and a non-thesis option, both of which require 30 credit hours beyond the bachelor's degree. The thesis option is accomplished by taking 18 to 21 graduate course credits and preparing a written thesis involving 9-12 credits of research or problems credits. Students have until the middle of their second semester in residence at the university to choose a supervisor and a thesis topic. The non-thesis track requires 27 hours of graduate course credits plus 3 hours of research credit leading to completion of a smaller-scope research project.

The doctoral degree requires 72 hours beyond a bachelor's degree, and may include as many as 24 hours credit from a prior master's degree. Doctoral candidates must pass a qualifying exam during their first year in residence to assess their general background so that a meaningful program of study can be constructed. The usual doctoral program involves courses within and outside the department, and researching the dissertation topic prior to taking the comprehensive examination by the end of the second year. The results of the dissertation research are presented to the faculty and graduate students when the student has completed the project.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Undergraduate

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## Department Level Requirements - Geological Sciences

### Departmental Honors

Departmental honors can be achieved by students who maintain a cumulative GPA of 3.0, departmental GPA of 3.2, and who complete a senior thesis.

### Dual Degrees

The Department of Geological Sciences offers dual degree programs with the Department of Soil, Environmental and Atmospheric Science in their emphasis area of Environmental Soil Science and with the Department of Civil and Environmental Engineering and with the College of Education in the Bachelor of Science in Education, emphasis in Earth Science Education. For more information, contact an advisor in the department.

## BA in Geological Sciences

### Major Program Requirements

The B.A. Curriculum is designed as a degree through which the student wishes to eventually pursue a career in teaching, journalism, law, etc. In addition to the major core requirements, students must complete all university graduation requirements including university general education (p. 18), as well as all degree and college or school requirements.

#### Geology core requirements

GEOL 1100	Principles of Geology with Laboratory	4
or GEOL 1200	Environmental Geology with Laboratory	
or GEOL 1050	Planet Earth	
GEOL 1250	The World's Oceans	3
or GEOL 2300	Earth Systems and Global Change	
or GEOL 2500	Regional Geology Field Trip	
GEOL 2150	The Age of the Dinosaurs	3
or GEOL 2350	Historical Geology	
GEOL 2400	Surficial Earth Processes and Products with Laboratory	4
or GEOL 2450	Global Water Cycle	
GEOL 3250	Mineralogy	5
Geology course at 3000 level or above		3
Geology course at 4000 level or above (including GEOL 4950 Senior Thesis)		3

#### Total Credit Hours in Geology (23-25)

#### Collateral Math/Science requirements

MATH 1140	Trigonometry	2
or MATH 1160	Precalculus Mathematics	
CMP_SC 1040	Introduction to Problem Solving and Programming	3
or MATH 1400	Calculus for Social and Life Sciences I	
or STAT 1300	Elementary Statistics	
CHEM 1000	Introductory Chemistry	2
ASTRON 1010	Introduction to Astronomy	4
or ATM_SC 1050	Introductory Meteorology	
or CHEM 1320	College Chemistry I	
or PHYSICS 1050	Concepts in Cosmology	

or PHYSICS 1150	Concepts in Physics	
or PHYSICS 1210	College Physics I	
BIO_SC 1010	General Principles and Concepts of Biology	3
or BIO_SC 1030	General Principles and Concepts of Biology with Laboratory	
or BIO_SC 1060	Basic Environmental Studies	
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
or NAT_R 1060	Ecology and Conservation of Living Resources	
<b>Total Credit Hours in Collateral Math and Science (13-19)</b>		
Total Credits		39

## Semester Plan

First Year			
Fall	Credits	Spring	Credits
GEOL 1100	4	GEOL 2500	3
MATH 1100	3	CHEM 1320	4
CHEM 1000	2	Foreign Language	5
ENGLISH 1000	3	American History or Political Science	3
Foreign Language	5		
	17		15
Second Year			
Fall	Credits	Spring	Credits
GEOL 2400	4	GEOL 2150	3
MATH 1400	3	Humanities or Fine Arts	3
BIO_SC 1010	3	Social Science	3
Foreign Language	3	Behavioral Science	3
General Elective	3	General Elective	3
	16		15
Third Year			
Fall	Credits	Spring	Credits
GEOL 3250	5	GEOL 3800	4
Humanities or Fine Arts	3	General Elective	3-5
Behavioral Sciences	3	Humanities or Fine Arts	3
Social Sciences	3	2000 Level Behavioral Sciences	3
General Elective	3	General Elective	3
	17		16-18
Fourth Year			
Fall	Credits	Spring	Credits
GEOL 4650	3	General Elective	3
General Elective	3	General Elective	3
2000 Level Humanities or Fine Arts	3	General Elective	3
2000 Level Social Sciences	3	General Elective	3
General Elective	3	General Elective	3
	15		15
Total Credits: 126-128			

## BS in Geological Sciences

### Major Program Requirements

Majoring in geological sciences and earning a Bachelor of Science degree prepares the student for graduate work and a career as a professional geologist in industry, research or academia. The curriculum provides flexibility for students who seek to focus on a specific subdiscipline in the geosciences. Students interested in geophysics, for example, should use their electives to expand their background in math and to develop a broad knowledge of geology and geophysics. In addition, students must meet all degree, college, and university graduation requirements including university general education.

#### Major core requirements 53-54

GEOL 1100	Principles of Geology with Laboratory	4
or GEOL 1200	Environmental Geology with Laboratory	
GEOL 2350	Historical Geology	3
GEOL 2360	Historical Geology Laboratory	1
GEOL 2400	Surficial Earth Processes and Products with Laboratory	4-5
or GEOL 2110	Introduction to Soil Science with Laboratory	
GEOL 3250	Mineralogy	5
GEOL 3300	Introduction to Geochemistry	3
GEOL 3800	Sedimentology with Lab	4
GEOL 4150	Structural Geology	4
GEOL 4650	Plate Tectonics	3
GEOL 4900	Igneous and Metamorphic Petrology with Laboratory	4
GEOL 4992	Field Course	6
Additional geological sciences course at or above 2000 level (not GEOL 3200)		3

Three additional geological sciences courses at 4000 level, cannot be fulfilled by problems 9

#### Related courses 24-29

##### Track I

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3

##### Track II

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
PHYSICS 1210	College Physics I	4
PHYSICS 1220	College Physics II	4
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
GEOL 1100 or 1200	4	GEOL 2350	3		
CHEM 1320	4	GEOL 2360	1		
MATH 1160	5	CHEM 1330	4		
ENGLISH 1000	3	MATH 1500	5		
		American History OR Political Science Course	3		
	16		16		
Second Year					
Fall	Credits	Spring	Credits		
GEOL 2110 or 2400	4-5	GEOL Elective Course	3		
GEOL 3250	5	PHYSICS 2750	5		
MATH 1700	5	Social/ Behavioral Science Course	3		
Humanities/ Fine Arts Course	3	Humanities/ Fine Arts Course	3		
	17-18		14		
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
GEOL 3300	3	GEOL Elective Course	3	GEOL 4992 (Or Year 4 - Summer)	6
GEOL 3800	4	GEOL 4150	4		
PHYSICS 2760	5	Humanities/ Fine Arts Course	3		
Foreign Language OR Alternative	3	Foreign Language OR Alternative	3-5		
	15		13-15		6
Fourth Year					
Fall	Credits	Spring	Credits		
GEOL 4650	3	GEOL Elective Course	3		
GEOL Elective Course	3	GEOL 4900	4		
2000-Level Humanities/ Fine Arts Course	3	Elective Course	3		

Social/ Behavioral Science Course	3	2000-level Social/ Behavioral Course	3
Foreign Language OR Alternative	3-5		
	15-17		13
Total Credits: 125-130			

## Minor in Geological Sciences

A minor in geological sciences consists of 15 credits in the geological sciences with 9 or more at the 2000-level or above. All courses must be taken for a letter grade, and a grade of C- or better must be earned in each course. The courses must be selected in consultation with an advisor in the department.

## Graduate

### MS in Geology

Contact: Dr. Rober Bauer  
 101 Geological Sciences Building  
 573-882-6785  
<http://geology.missouri.edu/index.html>

The master's degree program includes a thesis and a non-thesis option, both of which require 30 credit hours beyond the bachelor's degree. The thesis option is accomplished by taking 18 to 21 graduate course credits and preparing a written thesis involving 9-12 credits of research or problems credits. Students have until the middle of their second semester in residence at the university to choose a supervisor and a thesis topic. The non-thesis track requires 27 hours of graduate course cred-its plus 3 hours of research credit leading to completion of a smaller-scope research project.

### Admission Criteria

Fall deadline: none set, but February 15 for guaranteed consideration for departmental financial aid

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
71	530

- Minimum Academic IELTS scores:

Item	Score
OVERALL	5.5

**Note on GRE Scores and GPA:** Our quantitative assessment of applicants uses a combination of GPA for the last 60 hours and the student's GRE verbal, quantitative and analytical writing scores. We have a formula that weights the GPA and total GRE scores equally. Applicants with a GPA less than 3.0 may be considered, but their acceptance would require very strong GRE scores or exceptional circumstances.

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents. We require applicants to submit applications through our online system.

*To the Geological Sciences Program:*

- 3 letters of recommendation (submitted through the Graduate School's online application system)
- Personal statement (uploaded into Graduate School application online)
- GRE scores

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellow-ships or other funding packages. Check the program website or ask the program contact for details.

### PhD in Geology

Contact: Dr. Robert Bauer  
 101 Geological Sciences Building  
 573-882-6785  
<http://geology.missouri.edu/index.html>

The doctoral degree requires 72 hours beyond a bachelor's degree, and may include as many as 24 hours credit from a prior master's degree. Doctoral candidates must pass a qualifying exam during their first year in residence to assess their general background so that a meaningful program of study can be constructed. The usual doctoral program involves courses within and outside the department, and researching the dissertation topic prior to taking the comprehensive examination by the end of the second year. The results of the dissertation research are presented to the faculty and graduate students when the student has completed the project.

### Admission Criteria

Fall deadline: none set, but February 15 for guaranteed consideration for departmental financial aid

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
71	530

- Minimum Academic IELTS scores:

Item	Score
OVERALL	5.5

**Scores and GPA:** Our quantitative assessment of applicants uses a combination of GPA for the last 60 hours and the student's GRE verbal, quantitative and analytical writing scores. We have a formula that weights the GPA and total GRE scores equally. Applicants with a GPA less than 3.0 may be considered, but their acceptance would require very strong GRE scores or exceptional circumstances.

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents. We require applicants to submit applications through our online system.

*To the Geological Sciences Program:*

- 3 letters of recommendation (submitted through the Graduate School's online application system)

- 
- Personal statement (uploaded into Graduate School application online)
  - GRE scores

## **Financial Aid from the Program**

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellow-ships or other funding packages. Check the program website or ask the program contact for details.

## German

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Tim Langen, Chair  
 College of Arts and Science  
 451 Strickland Hall  
 (573) 882-4328  
 grs@missouri.edu

The Department of German and Russian Studies offers courses in German and Russian language, literature, film and civilization. It also offers instruction in Arabic, Chinese, Japanese, Hebrew and Korean. Many courses, such as civilization, culture, literature in translation and film courses, do not require knowledge of a foreign language.

The department offers the Bachelor of Arts with majors in German and in Russian, and the Master of Arts in German and in Russian and Slavonic Studies. The department also offers minors in German and in Russian. Many courses in the minor in East Asian Studies are taught in the Department of German and Russian Studies. The Film Studies program is also housed in the department.

## Faculty

**Professor** R. F. Cook\*  
**Associate Professor** S. Engelstein\*, S. Ireton\*, K. Kopp\*, B. Prager\*, C. Strathausen\*  
**Assistant Professor** S. Franzel\*  
**Associate Teaching Professor** M. Fischer\*  
**Assistant Teaching Professor** M. McKinstry, O. Schmidt

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 199)
- BA in German (p. 199)
- Minor in German (p. 200)

## Dual Degrees and Double Majors

As a double major or a dual degree has become an ever more popular choice, an increasing number of students choose German or Russian as one of their majors. Students looking forward to a career in medicine or in the sciences use a double major to ensure a thorough background in the humanities to balance their scientific studies. Double majors within the College of Arts and Science can be arranged and, if the second degree program is identified early, dual degree programs outside the college are also possible. Combined programs with journalism, international studies, education and business are frequent choices. Within the college, combinations with political science, history, philosophy, art history, and the sciences are popular double major programs.

## Graduate

College of Arts and Science  
 451 Strickland Hall

573-882-4328

<http://german.missouri.edu/degprogs/germangradstudies.html>

**Director of Graduate Studies:** Sean Ireton

- MA in German (p. 200)

The German and Russian Studies Department offers BA and MA degrees in two cultures and languages of critical significance in the world today - German and Russian. The German program prepares students for admission to PhD programs and for professional language careers in a number of fields. Courses in language, literature, teaching techniques and skills, seminars in various specialized aspects of German studies, and directed study and research provide candidates with opportunities to acquire a comprehensive background in German studies. Teaching assistants receive training in pedagogy.

## Resources and Facilities

Resources include extensive library holdings in German literature, cultural studies, and teaching methodology, and an electronically equipped audiovisual laboratory for language training.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Undergraduate

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## Department Level Requirements - German

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### Departmental Honors - German

Departmental honors are available for students majoring in German with a minimum 3.3 GPA. At least two literature courses must be taken at the 4000-level, with no grades below B. The equivalent of one of the courses may be completed in study abroad. Alternately, at the discretion of the department, a paper written within the capstone course may be substituted.

## BA in German

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### Major Program Requirements

The major in German consists of 27 credits in German beyond GERMAN 2100. The German faculty strongly encourages all majors to spend at least one semester studying abroad at a German university. Equivalents to all the required courses for the major are available through study abroad. In addition, students must meet all degree, college and university graduation requirements including university general education.

**Major core requirements (beyond the A&S language requirement)**

The following courses or their equivalents must be included:

GERMAN 2260	Intermediate German II: Language and Culture	3
GERMAN 3160	German Conversation and Composition	3
or GERMAN 3190	Contemporary German Culture	

GERMAN 3230	Introduction to German Literature	3
GERMAN 4980	German Capstone Seminar	3
One GERMAN 4200-level literature course		3
GERMAN 2310	German Civilization: Beginning to 1850 *	3
or GERMAN 2320	German Civilization: 1850 to Present	

### Electives

Elective courses and equivalents to replace the required courses above should be selected in consultation with the advisor.

Total Credits 18

\* German 2310 and 2320 are Writing Intensive German civilization courses. Versions of both 2310 and 2320 taken online do NOT count towards the major or minor requirements.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GERMAN 2260	3	GERMAN 3160	3
HIST 1100	3	Course for Second Major	3
ENGLISH 1000	3	MATH 1100	3
Course for Second Major	3	Foundation Requirements (Sciences with Lab)	5
Foundation Requirements (Humanities)	3	Foundation Requirements (Social Sciences)	3
	15		17
Second Year			
Fall	Credits	Spring	Credits
GERMAN 3230	3	GERMAN 3190	3
Course for Second Major	3	GERMAN 2320	3
Course for Second Major	3	Course for Second Major	3
Foundation Requirements (Sciences-Math Reasoning Proficiency)	3	Course for Second Major (WI)	3
Foundation Requirements (Behavioral Sciences)	3	Foundation Requirements (Science)	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
GERMAN 3005	3	GERMAN 4230	3
GERMAN 4160	3	Course for Second Major	3
Elective in German	3	Foundation Requirements (Behavioral Sciences)	3
Elective in German	3	Elective Course	3
Foundation Requirements (Social Sciences)	3	Elective Course	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
GERMAN 4240	3	GERMAN 4980	3

Course for Second Major	3	Capstone Course for Second Major	3
Course for Second Major	3	Foundation Requirements (Humanities)	3
Foundation Requirements (Social Sciences)	3	Elective	3
Elective Course	3	Elective	3
	15		15
Total Credits: 122			

**NOTE:** Third Year - Study Abroad at German University

## Minor in German

The department offers a minor in German consisting of 15 credits beyond GERMAN 2100. A minimum of 6 of these 15 credits must be in German courses numbered 3000 or above. In addition, a minimum of 9 of the 15 credits must be completed in residence. For the German minor, 12 of the 15 credits must be in courses where the language of instruction is German.

## Graduate

### MA in German

### Application and Admission Information

Admission Contact Information

Dr. Sean Ireton  
iretons@missouri.edu  
218C Strickland  
Columbia, MO 65211  
573-882-4672

### Admission Criteria

Fall deadline: First preference given to applications received by January 15, subsequent applications welcomed

Note: Applications received by January 15 receive first consideration

Spring deadline: August 1

Note: Applications to begin Spring semester are not encouraged.

Assistantships are typically not available for graduate students beginning Spring semester.

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GPA: 3.0
- Undergraduate major in German or equivalent

Note: The department reserves the right to evaluate the work presented for admission and to determine how the student may make up for background deficiencies.

### Required Application Materials

**To the Graduate School:**

- All required Graduate School documents

**To the Program:**



- Departmental application
- 3 letters of recommendation

## **Degree Requirements**

Students must complete a minimum of 30 hours of graduate-level courses with a GPA of B or higher. No fewer than 24 hours are to be earned in German courses at the 7000 or 8000 level and at least 15 hours must be taken in German courses at the 8000 level. A thesis, with a maximum of 6 hours of credit, or a critical essay, with a maximum of 3 hours credit, are optional. Courses taken outside the department must complement the student's plan of study and require the approval of the departmental adviser. No languages other than German and English are required. Information regarding specific course requirements can be obtained by writing to the director of graduate studies.

## **Comprehensive Examinations**

Candidates for the MA degree must pass comprehensive written and oral final examinations based on coursework and the departmental reading list.

## History

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R. Zguta, Chair  
College of Arts and Science  
101 Read Hall  
(573) 882-2068  
Fax: (573) 884-5151

The Department of History offers undergraduate work in the history of ancient, medieval and modern Europe, the United States, Latin America, Asia and Africa.

The department offers BA, MA and PhD degrees with majors in History. A minor is also available.

## Faculty

**Distinguished Professor** W. King\*\*

**Curators Professor** K. Miller\*\*, A. M. Smith\*\*, J. Sperber\*\*

**Professor** R. J. L. Bullion\*\*, R. M. Collins\*\*, T. Koditschek\*\*, S. Watts\*\*, L. Whites\*\*, J. H. Wigger\*\*, I. Worthington\*\*, R. Zguta\*\*

**Associate Professor** M. M. Carroll\*\*, J. M. Frymire\*\*, L. L. Huneycutt\*\*, L. Okamura\*\*, J. L. Pasley\*\*, L. S. Reeder\*\*, C. E. Rymph\*\*, R. Smale\*\*

**Assistant Professor** M. Bednar\*\*, D. Domingues\*\*, K. Ervin\*\*, J. Frank\*\*, I. Karthas\*\*, M. Morris\*\*, S. Ong\*\*

**Professor Emeritus** R. Bienvenu\*, W. J. Burggraaff\*, S. Flader\*\*, A. A. Ibrahim\*, C. G. Nauert Jr.\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 202)
- BA in History (p. 202)
- Minor in History (p. 203)

## Graduate

College of Arts and Science  
101 Read Hall  
573-882-2481  
<http://history.missouri.edu/>

**Director of Graduate Studies:** John Bullion

- MA in History (p. 203)
- PhD in History (p. 205)

By any measure one might choose, the History Department at the University of Missouri is an outstanding one. Our faculty has compiled a distinguished record of scholarship, receiving major awards to support their research from the National Endowment for the Humanities, the National Science Foundation, the John Simon Guggenheim Foundation and many other sponsors of cutting edge scholarship. Their books have won prizes from the American Historical Association, the Organization

of American Historians and other national and regional scholarly organizations.

The department's teaching record is every bit as distinguished as its record of scholarly accomplishment. Graduate students work closely with professors in advanced seminars and write theses and dissertations on a wide variety of topics. The teaching opportunities the department offers graduate students prepare them well for dealing with the difficult job market for new history PhDs. Over the last ten years, University of Missouri history PhDs have found positions at more than forty different colleges and universities across the United States.

## Areas of Study

Lecture courses, seminars and directed research projects are available on the histories of Western Europe, Russia, Great Britain, South Asia, East Asia, Latin America and the United States. While students are expected to get specialized training in the fields of their choice, they are also urged to develop a broad historical background.

## Facilities and Resources

Ellis Library has substantial research materials in all fields of graduate study, including an unusual collection of more than 5,000 pamphlets on 17th- and 18th-century British history and 18th- and 19th-century British and continental journals, including publications of all the major academies. The Health Sciences Library has excellent publications on the history of medicine. An additional resource is the Western Historical Manuscript Collection, a unique repository of material for regional studies in political, social and economic history. The State Historical Society of Missouri has an outstanding library of finding aids and primary and secondary works dealing with Missouri history. The graduate program also has available the resources of the Truman Library at Independence, Missouri.

## Internal Funding

Applicants may compete for Graduate School fellowships for entering students. Graduate School fellowships require departmental nomination. Interested students should consult with the director of graduate studies for further details. The department provides qualified students the opportunity to gain college-level teaching experience as teaching assistants who conduct discussion sections in American and European history. Pending administrative approval and availability of funding, they earn at least \$11,691 an academic year and carry nine semester hours. Each appointment is subject to annual review and may be renewed up to a maximum of six years.

## Undergraduate

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## Department Level Requirements - History

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There are no requirements at the department level for this degree.

## BA in History

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## Major Program Requirements

A student majoring in history must complete a total of 33 history credits. With the consent of the departmental director of undergraduate studies,

certain history requirements can be waived for students pursuing dual degrees or double majors. A grade of C- or better is required for all courses taken for the major. In addition, students must complete all university graduation requirements and Arts and Science Foundation Requirements.

<b>Major core requirements</b>	<b>33</b>
Introductory courses (below 2000) from three of the following areas	9
United States to ca. 1865	
United States since ca. 1865	
Europe	
Third World (Africa, Asia, Latin America)	
One additional course (1000 level or above, not including HIST 1100, 1200, 1500, 1510) from each of the following areas	9
Europe	
United States	
Third World	
Electives at the 3000 level or above, from any field of history	9
Seminar/thesis block	6
One undergraduate seminar and one additional history course at the 4000-level	
OR Undergraduate Thesis	
OR Honors Thesis	
<b>Total Credits</b>	<b>66</b>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	ENGLISH 1000	3
Behavioral Science Course	3	Biological/Physical/Math Science Course with lab	5
Social Science Course	3	Minor	3
Humanities Course	3	History Course	3
History Course	3		
	15		14
Second Year			
Fall	Credits	Spring	Credits
Foreign Language	5	Foreign Language	5
Behavioral Science Course	3	Minor	3
Humanities Course	3	Humanities Course	3
Social Science Course	3	History Course	3
History Course	3		
	17		14
Third Year			
Fall	Credits	Spring	Credits
Foreign Language	3	Humanities Course	3
Biological/Physical/Math Science Course	4	Minor	3
History Course	3	History Course	3

History Course	3	History Course	3
Elective Course	3	Elective Course	3
	16		15
Fourth Year			
Fall	Credits	Spring	Credits
Minor	3	Social Science Course	3
Minor	3	History Course	3
History Course	3	History Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
	15		15
Total Credits: 121			

## Minor in History

A minimum of 15 credits is required for a minor in history. At least 9 of the 15 must be in courses numbered 2000 or above. A minimum of 9 credits must be taken in residence, 6 of which must be in courses numbered 2000 or above. A grade of C- or better is required for all history courses taken for a minor. The selection and mix of courses is left to the discretion of the student.

## Graduate

### MA in History

#### Admission Contact Information

Nancy Taube (tauben@missouri.edu)  
 101 Read Hall; Columbia, MO 65211  
 573-882-9461

#### Admission Criteria

Fall deadline: January 11

- Minimum GPA: 3.0 in last 60 hours
- BA or BS degree
- GPA of 3.3 in undergraduate history courses, and at least 18 hours in history
- Minimum TOEFL scores (international applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Candidates who lack the necessary undergraduate hours in history must take graduate-level classes in history to remedy that deficiency before they can be considered for admission. They should consult with the director of graduate studies about appropriate classes. Graduate School regulations prohibit a non-degree student from taking more than twelve hours of course work.

Candidates must achieve a grade point average in these classes of at least 3.3 on a 4.0 scale to be considered for admission. A 3.3 GPA or higher does not guarantee admission. Course work taken as a non-degree student to remedy a deficiency in prerequisites ordinarily will not count toward the MA degree.

## Required Application Materials

### *To the Graduate School:*

- All required Graduate School documents, including Graduate School online application
- One official copy of each college transcript where a degree was earned or is pending
- Short essay explaining goals and expectations in graduate study, including the fields in which the student plans to specialize (upload to the online application)
- Substantial writing sample, such as a final research paper from a course (upload to the online application)
- 3 letters of recommendation (submission through the online application system strongly preferred, but postal mail submission directly to the department allowed)
- Official GRE score report
- Official TOEFL score for international students

**Note:** Incomplete applications will not be considered. It is the applicant's responsibility to ensure that all required documents have been received by the Jan. 13 deadline.

## Financial Aid from the Program

In this department, all applicants are considered for financial aid unless they indicate otherwise. Announcements of awards are made no later than April 1. Applicants may compete for Graduate School fellowships for entering students. Graduate School fellowships require departmental nomination. Interested students should consult with the director of graduate studies for further details.

The department provides qualified students the opportunity to gain college-level teaching experience as graders who grade exams and papers in American and European history. Pending administrative approval and availability of funding, they earn at least \$5,845 an academic year and carry nine semester hours.

Each appointment is subject to annual review and may be renewed up to a maximum of two years.

## Requirements for the Degree Residency

A minimum of two semesters of full-time enrollment (9 hours each semester) or three semesters of part-time enrollment (6 hours each semester). Enrollment in all graduate courses requires the consent of the student's adviser and the instructor(s) of the class.

## Hours

Thirty semester hours of graduate credit are required by the Graduate School for the MA degree. The Graduate School also mandates that at least fifteen of these hours be in courses numbered 8000 or above, and will not count more than twelve hours of individually directed studies toward the thirty hours necessary to earn the degree. The department requires that at least twenty of these hours be in history. For students of United States history, at least fifteen hours must be in formally constituted US history courses. For students in the non-United States history program, at least twelve hours must be in formally constituted non-US history courses. Independently directed work does not count toward fulfilling this requirement in either category.

## Required Courses

A readings seminar in every semester in which as many as nine credit hours are carried, unless the student is granted an exemption by the director of graduate studies. Every master's student must take HIST 8480 Historiography unless excused by the director of graduate studies. HIST 8480 is offered every Spring semester.

Every student who is a non-thesis candidate must complete at least two research seminars before receiving the MA degree. No master's candidates in US or non-US history are required by the department to demonstrate reading proficiency in any foreign languages or to develop research skills before receiving the MA degree. Individual advisers, however, can require MA candidates to become proficient in reading foreign languages and/or develop specific research skills if they determine such knowledge is essential for the successful completion of a student's master's program. As soon as any such determination is made, students will be informed by their advisers. The advisers will also discuss with them processes for achieving and demonstrating those proficiencies.

Master's candidates in Ancient History must demonstrate proficiency in at least one ancient language (Greek or Latin) and at least one modern language (generally, either French or German) before they begin work on their theses, if they choose that alternative, or before they take the non-thesis MA examination, if they are seeking a terminal master's degree. These students should also be aware that ancient history graduate courses can include readings in Greek and Latin. For directions on how to demonstrate proficiency in these ancient and modern languages, students should talk with their advisers and obtain a written description of this process from them.

**Special Note:** No student will receive graduate credit for any course in which s/he earns a grade below B. The grade of C in a graduate class is the equivalent of an F in an undergraduate course.

## Satisfactory Progress and Annual Review

At the beginning of every Spring semester, students must complete a "Progress Report" on the Graduate School's Graduate Student Progress System (sometimes referred to as "online assessment"). This report will be read by the student's faculty adviser, who will then submit an "Adviser Response." In addition, the student and adviser should meet to discuss the student's progress, confirm expectations for the coming year, and address any concerns either may have regarding the report.

This is an extremely important process for two reasons. First, the adviser determines whether the student is making satisfactory progress toward a degree. If s/he is not, the adviser informs the student what needs to be done to rectify the situation. The student then usually has a year to return to making satisfactory progress. Failure to do so may result in loss of financial aid or dismissal from the program. Second, if the student is making satisfactory progress, the adviser and s/he decide together on what reasonable goals are for the next twelve months. These goals will define "satisfactory progress" at the next assessment meeting.

## Appeals

The student may appeal any assessment to the director of graduate studies. If not satisfied, s/he may seek the remedies described in the Graduate School catalog.

## Effect of Progress Report Completion on Funding

Completion of the Graduate Student Progress System forms by both student (Progress Report) and faculty (Adviser Response) is mandatory to maintain eligibility for any form of financial aid from the department. Receipt of financial aid requires confirmation by a student's adviser that s/he is making satisfactory progress. No student in the program who applies for or who is seeking renewal of financial aid will be eligible for aid without a complete and up-to-date Graduate Student Progress System Report on file.

## Plans for MA Degrees: Thesis plan

All students who wish to apply for admission to doctoral programs in history either at the University of Missouri or at other institutions must write a thesis. A thesis involves an original and extended analysis of an historical issue that requires substantial research. The topic of the thesis must be approved in advance by the student's faculty director and the thesis committee, which is composed of the director, at least one other member of the history faculty, and one faculty member from outside the department.

Graduate School regulations require that there be an outside faculty person on each thesis committee. At the discretion of the director, additional faculty members may be added to the committee. The appropriate forms, signed by the adviser and the director of graduate studies, will be submitted to the Graduate School.

Students will take HIST 8090, Thesis Research, during those semesters they are actually engaged in writing their thesis. N.B.: The Graduate School only permits six hours of HIST 8090 to count toward the 30 hours necessary to earn a master's degree. Students should also note that hours earned in HIST 8090 do count toward the maximum of 12 hours of independent study, i.e., HIST 8085 (Problems), HIST 8089 (Research), and HIST 8090 (Thesis Research), the Graduate School will accept as credit for this degree.

## Plans for MA Degrees: Non-thesis plan

Students may earn a master's degree without writing a thesis. A non-thesis MA is a terminal degree. Those who receive it will not be considered for admission to the doctoral program. These students must successfully complete two research seminars in history. These seminars will count toward the thirty hours required for an MA degree. One of the seminar papers must be submitted to the department to fulfill the Graduate School requirement for a substantial effort reflecting creativity or originality.

## Examination for the MA degree: For Thesis Plan

The student must defend her/his thesis before a committee of at least three faculty members, one of whom must be the thesis director. Another must be from a department other than History. The committee is appointed by the Dean of the Graduate School upon recommendation from the Department of History. The examining committee decides:

1. whether to recommend the awarding of the MA degree to the student
2. for prospective doctoral candidates, whether the student shall be permitted to enter the doctoral program.

This latter action constitutes a decision on the qualifying examination required in the doctoral program. Afterwards, the appropriate form(s) will be signed by the adviser, committee members, and the director of graduate studies, then sent to the Graduate School.

## Examination for the MA degree: For Non-Thesis Plan

A comprehensive oral examination covering all work for the degree will be conducted by a committee of the adviser and at least two other faculty members, one of whom may be from a department other than history. The examining committee decides whether to recommend the awarding of the MA degree. Afterwards, the appropriate form(s) will be signed by the adviser, committee members, and the director of graduate studies, then sent to the Graduate School.

## Graduate School Deadlines for receipt of the MA degree

Students must meet Graduate School deadlines for the awarding of degrees and the submission of theses. The final form of the thesis must be in conformity with the Graduate School requirements.

## PhD in History

### Admission Contact Information

Nancy Taube (tauben@missouri.edu)  
101 Read Hall; Columbia, MO 65211  
573-882-9461

### Application Deadline

Fall deadline: January 11

### Admission Criteria

- MA in history strongly preferred
- Quality of master's thesis or research seminar paper submission
- Minimum TOEFL scores (international applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Students who do not meet one or more of these criteria may enroll as non-degree graduate students. Contact the director of graduate studies for further details. All admissions of doctoral candidates who did not receive the MA degree from the department are provisional. These students must pass a qualifying examination. See below for information about the qualifying examination.

## Required Application Materials

### To the Graduate School:

- All required Graduate School documents, including Graduate School online application
- One official copy of each college transcript where a degree was earned or is pending
- Short essay explaining goals and expectations in graduate study, including the fields in which the student plans to specialize (upload to the online application)
- Substantial writing sample, such as a final research paper from a course (upload to the online application)

- 3 letters of recommendation (submission through the online application system strongly preferred, but postal mail submission directly to the department allowed)
- Official GRE score report
- Official TOEFL score for international students

**Note:** Incomplete applications will not be considered. It is the applicant's responsibility to ensure that all required documents have been received by the Jan. 13 deadline.

## Financial Aid from the Program

In this department, all applicants are considered for financial aid unless they indicate otherwise. Announcements of awards are made no later than April 1. Applicants may compete for Graduate School fellowships for entering students. Graduate School fellowships require departmental nomination. Interested students should consult with the director of graduate studies for further details.

The department provides qualified students the opportunity to gain college-level teaching experience as teaching assistants who conduct discussion sections in American and European history. Pending administrative approval and availability of funding, they earn at least \$11,691 an academic year and carry nine semester hours. Each appointment is subject to annual review and may be renewed up to a maximum of six years.

## Qualifying Examination

To be admitted to candidacy for a PhD in history, a student must have earned an MA in history or a related discipline and have passed a qualifying examination.

Students with an MA from the University of Missouri

Students earning their MA in history at this university may, with the approval of their advisory committee, combine their qualifying examination with their MA thesis defense. Other students must take their qualifying examination no later than the beginning of their third semester in the graduate program at the University of Missouri-Columbia.

Students Who Earned Degrees at Other Institution

All admissions of doctoral candidates who did not receive the MA degree from the department are provisional. These students must pass a qualifying examination no later than the beginning of their third semester of residence at MU. The exam will focus on a research paper the student wrote at MU.

## About the Exam

The examining committee will be composed of the student's adviser and at least two other history faculty members. During the consideration of prospective students, the committee on graduate admissions will consult closely with faculty best suited to advise them.

The basis for the examination will be a substantial research-based seminar paper written here. The exam will be oral, approximately one hour in length; the examiners will include the student's adviser and at least two other members of the department. It is designed to ascertain the candidate's intellectual capacity, aptitude, and preparation for PhD level work in history.

The committee reserves the right to reject otherwise qualified students if

1. this department cannot provide the applicant with an adequate program in his/her area of interest

2. no faculty member is willing to supervise his/her work.

## PhD Program Overview

The PhD program in history at the University of Missouri-Columbia is governed by a number of rules, regulations, and expectations. What follows is an explanation of these elements of the program.

## Adviser and Advisory Committee

A student will meet with his/her adviser no later than the semester following passage of the qualifying examination for students who earn their MA in history at the University of Missouri and prior to the qualifying examination for other students. The adviser and student together will plan the student's class work up to the comprehensive exams. They will also choose other members of the student's doctoral committee. That committee will ordinarily consist of the adviser, three members of the history department who are on the graduate faculty, and one graduate faculty member from outside the department. The advisory committee must be approved by the dean of the Graduate School.

## Developing a PhD Plan of Study

The committee will meet formally with the student to help the student to develop a major field, two broad historical fields, a historical field outside his/her area of major emphasis, and one field in a discipline other than history for the comprehensive examination. How s/he will meet the foreign language and/or historical research technique requirement (see below) will be defined and approved by the adviser and the committee. Members of the advisory committee shall meet regularly with the student to ensure he/she is making satisfactory progress.

## PhD Degree Requirements

To obtain a PhD in history at the University of Missouri, a student must fulfill the following requirements:

1. residency
2. course work
3. foreign language and/or historical/research technique
4. comprehensive examination
5. dissertation and oral defense

## Residency

A minimum of two semesters of full-time enrollment (9 hours each semester) or three semesters of part-time enrollment (6 hours each semester). Enrollment in all graduate courses requires the consent of the student's adviser and the instructor(s) of the class.

## Course Work

The minimum requirement for the PhD degree at the University of Missouri is 72 hours of graduate credit beyond the baccalaureate degree. A student's adviser and committee may require more. Customarily, students in history have more than 72 hours when they defend their dissertations. If a student has earned an MA degree at another institution, with the approval of her/his adviser and committee, s/he may receive up to 30 hours of credit toward the 72 necessary for the PhD. If a student took additional courses beyond his/her MA degree at another institution, with the approval of her/his adviser and committee, s/he may receive up to a maximum of six hours of credit toward the PhD.

Graduate School regulations forbid the awarding of more than six hours. Two-thirds of the courses taken by a PhD candidate within the department prior to the comprehensive examination must be at the 8000 or 9000 level. These may, and probably will, include History 8085

(Problems), History 8410 (Independent Readings PhD Exam), History 9089 (Research), but not History 9090 (Dissertation Research).

Every doctoral student who earned his /her master's degree at another institution must take History 8480, Historiography, unless excused by the director of graduate studies. History 8480 is offered every spring semester.

#### Foreign Languages and Historical Research Techniques

PhD candidates must demonstrate abilities in foreign languages and/or historical research skills appropriate to the completion of a doctoral dissertation in their proposed field of research. There are four different ways a student may fulfill this requirement. Which one is chosen depends on the area of his/her research interest. The adviser and committee must approve the method for fulfilling this requirement.

## PhD Emphasis Areas

### Ancient History Emphasis

Candidates planning to write a doctoral dissertation in ancient history must demonstrate their competence in Greek and Latin, together with at least two modern languages (usually French and German).

For the ancient language, competence will be shown either by the successful completion of a translation examination designed by a history department faculty member with knowledge of the relevant language, or by the completion of upper-level courses in the department of classical studies, or by other such proof as the adviser and other members of the advisory committee deem appropriate.

Competence in the modern languages will be shown either by the successful completion of a translation examination designed by a history department faculty member with knowledge of the relevant language, or by passing the ETS language examination with a minimum score of 500, or by the successful completion of an upper level language course in any modern language department of the university.

### European History Emphasis

Candidates planning to write a dissertation in European history must be competent in two foreign languages.

Competence may be demonstrated either by successful completion of a research paper, the sources for which are predominantly in the foreign language under consideration, or by successful completion of a translation examination designed by a history department faculty member with knowledge of the relevant language, or by passing an ETS language examination with a minimum score of 500. A candidate's advisory committee may also require him/her to show competence in historical research technique. An historical research technique is a specialized field of study which provides a student with additional skills for research. Quantitative methods/statistics or techniques of historical exhibition, museum work, and the analysis of material culture are some examples. Competence will be demonstrated by satisfactory completion of a substantial research paper or other historical project for which the technique is necessary.

Students who take foreign language courses should keep in mind that all classes below 7000 may not be taken for graduate credit and do not count toward the 9 hours per semester required for those receiving financial aid.

### American History Emphasis

Candidates planning to write a dissertation in American history shall have a competent reading knowledge of one foreign language.

Competence in a foreign language shall be demonstrated in the ways described above for candidates in European history.

### Asian or Latin History Emphasis

Candidates planning to write a dissertation in Asian or Latin American history shall demonstrate a competence in such languages as their advisory committee requires for their research. In addition, a candidate's advisory committee may require the candidate to demonstrate competence in an historical/research technique, as defined above in the American History section (3).

## Preparation for the Comprehensive Examination

In the department of history, each doctoral student must prepare five fields for the comprehensive examinations. The selection of those fields and the faculty who will be the examiners in each should be begun by the doctoral candidate and her/his adviser during her/his first semester at MU. The adviser will help the student prepare for examination in her/his major field. This will cover significant historical themes and historiographical trends in the specific period and area of the student's prospective dissertation topic.

Two other members of the history faculty will help the student prepare for examinations in two chronological and/or geographical areas of historical study that are appropriate for his/her dissertation topic. A fourth member of the history faculty will prepare the student for an examination in a chronological, geographical, and/or thematic area of historical study that is not directly related to his/her dissertation topic. A fifth faculty member from a department other than history will prepare the student for examination in an outside field. This will cover the methodologies and research findings of another academic discipline.

## Areas of Study and Dissertation Topics

What the student learns in this discipline should assist his/her understanding of and research on her/his dissertation topic. The student's choice of a discipline to work in for his/her outside field is potentially as wide as the number of programs and departments in the university. That choice is not confined merely to departments in the College of Arts and Science. The student must have his/her adviser's approval of the discipline and the outside faculty member. The Graduate School must approve these selections as well.

Within the department of history there are seven broad areas of historical study.

- US history to 1865 (including the colonial period)
- US history since 1865
- Ancient history
- European history from the fall of Rome through the Reformation
- European history since the Reformation
- Latin American history
- Asian history

The three history faculty who, together with the adviser, will help the student prepare for the comprehensive examinations, must each test him/her on material in a different broad area. Thus the student will be working on three different broad areas, plus the dissertation field. The three faculty members may, in consultation with the student, define the broad area as narrowly or as widely as they choose.

## Documenting Exam Preparation

The adviser and the four other faculty members must explain how they want the student to prepare, what they want the student to master, and which criteria they will use to assess the examinations in their particular field. These explanations must be in writing, and copies of each placed in the student's permanent file.

## Comprehensive Examination Requirement

Students may take a comprehensive examination only after fulfilling their residency, course work and foreign language and/or historical research technique requirements. It will be administered by a committee consisting of his/her adviser and four other faculty members, one from a discipline other than history. These should be the faculty members who helped the student prepare for the examinations. Sometimes it may be necessary to find substitutes. The director of graduate studies and the Graduate School must approve any substitutions, and new committee members must describe their expectations in writing for the student and for his/her permanent file.

## Comprehensive Exams Processes

The comprehensive exams are given in two stages. The first is a series of at least three written exams. The second is an oral examination, which is conducted if the student passes the written portion. A report of the decision, signed by all members of the committee, must be sent to the Graduate School and the student no later than two weeks after the comprehensive exam is completed. One of the written exams must be in the major field; the committee will determine the subjects of the other exams, and their number.

**Special Note:** All members can require the student to write on their areas of expertise. Therefore the written examinations could cover all five areas.

All members of the committee will read the written exams and discuss them within two weeks after their completion. If they determine the student has not successfully completed the exam, they will inform him/her immediately and discuss the results. Failure ends the comprehensive exam at this point. The committee must provide the student with an outline in writing of the weaknesses and deficiencies of his/her work.

A copy of this must be placed in the student's permanent file. If at any time the student believes that parts of the exam are unclear, or the decision of the committee is incorrect, or the advice given by the committee is inadequate, s/he may send a written request for clarification and rectification to the committee. A copy of this request should be sent to the Graduate School as well. The committee must respond to this request in writing within two weeks and a copy must be filed with the department and the Graduate School.

At least 12 weeks must pass before a student who failed can take the comprehensive exams again.

If the committee determines that the student did satisfactory work on the written examinations, they will schedule an oral examination. This second stage of the comprehensive exams will cover all five fields. Each member of the committee will test the student. At the end of the oral examinations, the committee discusses the student's performance on each field and on the entire examination. This discussion includes both the written and the oral parts of the whole process. Then they vote pass, fail, or abstain on the student's total performance on the exam.

## Criteria for Successful Completion of the Comprehensive Exam

To complete the comprehensive exams successfully, the student must receive a vote of pass from at least four of the five examiners. Should two or more votes be negative or abstentions, the committee follows the same procedure outlined above for failure to pass the written part. These students must repeat the entire examination, not just the fields failed, and not just the oral portion. If the candidate fails the second examination, the examining committee must enter on its report to the dean of the Graduate School a recommendation to prevent the student's further candidacy.

## Dissertation and Oral Defense

Soon after successful completion of the comprehensive examination, the student and adviser will form a dissertation committee of five faculty members. One member of the committee must be from outside the department. The student shall develop with her/his adviser and committee a dissertation topic and a plan of research. S/he should keep in regular contact with the adviser. Together they shall decide when written work will be read by other members of the committee.

## Travel Funding

When students begin work on their doctoral dissertations, they may apply for departmental fellowships and travel grants to assist their research and writing.

## Satisfactory Progress

The department requires PhD candidates to make satisfactory progress towards completion of their degree.

## Annual Review

At the beginning of every Spring Semester, students must complete a "Progress Report" on the Graduate School's Graduate Student Progress System. This report will be read by the student's faculty adviser, who will then submit an "Adviser Response." In addition, the student and adviser should meet to discuss the student's progress, confirm expectations for the coming year, and address any concerns either may have regarding the report.

This is an extremely important process for two reasons. First, the adviser determines whether the student is making satisfactory progress toward a degree. If s/he is not, the adviser informs the student what needs to be done to rectify the situation. The student then usually has a year to return to making satisfactory progress.

Failure to do so may result in loss of financial aid or dismissal from the program. Second, if the student is making satisfactory progress, the adviser and s/he decide together on what reasonable goals are for the next twelve months. These goals will define "satisfactory progress" at the next assessment meeting.

## Appeals

The student may appeal any assessment to the director of graduate studies. If not satisfied, s/he may seek the remedies described in the Graduate School catalog.

## Funding Impact of Incomplete Reports

Completion of the Graduate Student Progress System forms by both student (Progress Report) and faculty (Adviser Response) is mandatory



to maintain eligibility for any form of financial aid from the department. Receipt of financial aid requires confirmation by a student's adviser that s/he is making satisfactory progress. No student in the program who applies for or who is seeking renewal of financial aid will be eligible for aid without a complete and up-to-date Graduate Student Progress System Report on file.

## **Rate of Completion**

A PhD student must successfully complete the comprehensive examination within a period of five years beginning with the first semester of enrollment as a PhD student. For an extension of this the student must petition the Graduate School by submitting a request to the adviser who, in turn, submits a written recommendation to the Graduate School. The director of graduate studies will also make a written recommendation. In addition, the dissertation must be successfully defended within five years of passing the comprehensive examination. On petition of the candidate and the candidate's department, an extension of time may be granted by the Graduate School.

## Interdisciplinary

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Office of Special Degree Programs  
College of Arts and Science  
114 Switzler Hall  
(573) 882-6060

### Faculty

**Professor** T. Tarkow  
**Instructor** K. Kerr

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 210)
- BA in Interdisciplinary (p. 210)
  - with emphasis in Black Studies (p. 211)
  - with emphasis in Environmental Studies (p. 211)
  - with emphasis in Peace Studies (p. 212)
  - with emphasis in Women's and Gender Studies (p. 213)

Interdisciplinary programs provide for the special needs and interests of individual students who are not being served by one of the existing majors. The Office of Special Degree Programs is responsible for a variety of multidisciplinary majors, including Interdisciplinary, International Studies and General Studies.

### Graduate

While MU does not offer graduate degrees specifically in interdisciplinary, the University does offer post-baccalaureate opportunities in a number of related areas, both within the College of Arts and Science, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

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### Department Level Requirements - Interdisciplinary

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There are no requirements at the department level for this degree. Please see the BA in Interdisciplinary (p. 210) page for degree requirements.

### BA in Interdisciplinary

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#### Major Program Requirements

Students majoring in Interdisciplinary may design an individual course of study. Students with very specific career plans and goals not easily accommodated in any one department may find this program suited for

their needs. Others may find that this option permits a broader approach than the major found in a single department.

The Interdisciplinary major is comprised of two or three components to total 36 credits. A component consists of course work from a single department or area, which may include programs outside the College of Arts and Science (e.g., Journalism, Business or Social Work). At least 18 hours must come from the College of Arts and Science. In addition to the 36 hours required in the major components, Interdisciplinary students must also complete a 3-credit capstone.

Interdisciplinary candidates must earn no less than a 2.0 GPA in each component. Interdisciplinary students are bound by rules and practices of the College of Arts and Science that pertain to admission to degree programs, the awarding of credit and the awarding of degrees. Students must complete college as well as University requirements, including University general education.

#### Major Core Requirements

Area of concentration (select one option) 36

- Three components of 12 credits each
- Three components, one of 15, one of 12 and one of 9 credits
- Two components of 18 credits each
- Two components, one of 21 and one of 15 credits

All courses in the major must be at the 2000 level, and at least 15 credits must be 3000 level or above.

A minimum of 12 credit hours within all components must be MU courses.

**Capstone requirement** (to be completed during final 45 hours of course work)

There are several ways a student can complete the capstone experience in Interdisciplinary Studies.

1. **Special Readings project:** With this option, the student completes an independent research project under the supervision of a faculty member. The project allows the student to explore an area of interest and is designed to be an academic challenge. The department is open to creative, innovative approaches to learning. The supervising faculty member is responsible for grading the project. The student is responsible for locating a supervising faculty member.
2. **Service Learning project:** Students will engage in service activities, directly relevant to their areas of academic emphasis, in community not-for-profit agencies. At the same time as participants work in the community, they will research their agency and organization, undergo mock employment interviews, create a cover letter and resume based on the professional skills they have gained through their service, and reflect on careers and leadership in public service. Course will be submitted for Writing Intensive credit each semester. Restricted to Interdisciplinary, General and International Studies students.
3. **Internship:** Students work approximately 50 clock hours per credit at an agency, company or corporation of their choice. Grades are on a pass-fail basis. For an internship to be approved as a capstone experience, it must help the student solidify and explore the areas of concentration. Internships must have prior approval from the Special Degree Programs Office.
4. **Capstone course:** Students may have a specific course designated as a capstone course for the individual degree program. The course must be upper level, and the course must be taken in the last

45 hours of course work as a major. A course taken previously cannot retroactively be counted as a capstone course. Approval for the course must be provided in advance of registration from the Interdisciplinary Studies advisor.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
Second Language Level I	5-6	Second Language Level II	5-6
Social Science (MO State Law) 1000+	3	Behavioral Science 1000+	3
Humanities and Fine Arts 1000+	3	Humanities and Fine Arts 1000+	3
General Elective 1000+	1	General Elective 1000+	1
	15-16		15-16
Second Year			
Fall	Credits	Spring	Credits
Second Language Level III	3	Math Reasoning Proficiency	3
Science with a Lab 1000+	3-5	Behavioral Science 2000+	3
Writing Intensive I 1000+	3	Social Science 2000+	3
Social Science 1000+	3	Humanities and Fine Arts 2000+	3
Humanities and Fine Arts 1000+	3	IDS Component #1 2000+	3
	15-17		15
Third Year			
Fall	Credits	Spring	Credits
Science 1000+	3	IDS Component #1 3000+	3
IDS Component #1 2000+	3	IDS Component #2 2000+	3
IDS Component #2 2000+	3	IDS Component #3 2000+	3
IDS Component #3 2000+	3	Writing Intensive II 3000+	3
General Elective or Minor 1000+	3	General Elective or Minor 1000+	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
IDS Component #1 3000+	3	IDS 4000+ Capstone	3
IDS Component #1 3000+	3	IDS Component #2 3000+	3
IDS Component #2 3000+	3	General Elective or Minor 1000+	3
IDS Component #3 3000+	3	General Elective or Minor 1000+	3
General Elective or Minor 1000+	3	General Elective or Minor 1000+	3
	15		15
Total Credits: 120-124			

## BA in Interdisciplinary with Emphasis in Black Studies

### Major Program Requirements

Emphasis in Black Studies - An Interdisciplinary Area in the College of Arts and Science

Wilma King, Director  
13 Gentry Hall  
(573) 882-6229

The Black Studies Program is an interdisciplinary program leading to a dual major or minor in the College of Arts and Science.

### Emphasis core requirements

- Completion of an area of concentration in another Arts and Science program or department
- Completion of an interdisciplinary area of concentration of at least 32 credits in black studies and related courses

In selecting a language to meet general education requirements in the College of Arts and Science, students are encouraged to consider Spanish, Portuguese or French.

## Semester Plan

Refer to the Semester Plan for the BA in Interdisciplinary Studies (p. 210).

## BA in Interdisciplinary with Emphasis in Environmental Studies

### Major Program Requirements

<http://web.missouri.edu/~umcsnresiwwww/index.html>

People in the environmental field work to protect and restore the natural services that clean water, build soil, scrub air, and maintain species that provide human food, shelter and well-being. Career opportunities fall into the five categories listed below with the majors that are the best preparation for each. The Environmental Studies website advising page can help you find the best category for you. For some majors, an Environmental Studies Certificate (ESC) is strongly encouraged. Because of the specific requirements of the major and the diverse ways they can be met, early advising is extremely important.

### Advocacy, Outreach & Communication

Environmental Studies or Business, Communication, Marketing, or Journalism plus an ESC.

### Policy and Regulation

Environmental Studies or Political Science plus an ESC.

### Conservation and Natural Resources

Biology, Environmental Science, Fisheries and Wildlife, Forestry, or Soil Science plus an ESC.

### Environmental Engineering and Scientific Services

Agricultural Systems Management, Biochemistry, Chemistry, Engineering, Environmental Science, Math, or Soil Science plus an ESC.

### Outdoor and Environmental Education

Parks, Recreation and Tourism, or Education plus an ESC.

## Environmental Studies Major (in Special Degrees)

- 18 hours of proscribed General Education Courses
- 15 hours *Natural Dimensions Courses*
- 15 hours *Social Dimensions Courses*
- 9 hours of *Practicum Courses (Seminar, Internship, Capstone)*

A student can take Natural and Social Dimension courses organized into informal tracks: (Note: Tracks do not appear on diplomas or transcripts.)

- Sustainable Lifestyles
- Water Soils and Climate
- Energy and Materials
- Conservation and Biodiversity
- Environmental Education

Students can also develop their own tracks with the assistance of the environmental studies program.

For details on the tracks, visit the environmental studies website: [web.missouri.edu/~umcsnrresiwww/esmajor.shtml](http://web.missouri.edu/~umcsnrresiwww/esmajor.shtml)

## Semester Plan

Refer to the Semester Plan for the BA in Interdisciplinary Studies (p. 210).

## BA in Interdisciplinary with Emphasis in Peace Studies

### Major Program Requirements

Clarence Lo, Ph.D., Director  
 326 Middlebush Hall  
 (573) 882-1736  
[loc@missouri.edu](mailto:loc@missouri.edu)

The peace studies emphasis area addresses a wide range of issues concerning peace and justice, including international and civil war and peace; global social and environmental justice; nonviolent social movements, process, and change; cultures, intellectuals, and war and peace; and indigenous peoples and the imperial state. Our courses provide a liberal arts foundation: students explore values to set goals; they evaluate evidence to assess alternate means to achieve goals. Some courses focus on practical issues of community organization (PEA\_ST 4341), sustainable development (PEA\_ST 1120) and construction, and public health (PEA\_ST 3401), that students are likely to encounter in work, internship, or volunteer positions. Study abroad courses taught by MU faculty are regularly offered. Since issues of peace and conflict cut across disciplines, the curriculum includes courses offered by both the program itself and cross listed between Peace Studies and other programs and departments of the University.

**Emphasis requirements** 30

**Core requirements**

PEA\_ST 1050 Introduction to Peace Studies

Select 12 credits from the following. It is recommended that students pick four courses distributed in at least four of the following areas

#### Area 1: International and Civil War and Peace

PEA\_ST 2200 Nuclear Weapons: Environmental, Health and Social Effects

PEA\_ST 2410 Philosophies of War and Peace

PEA\_ST 3230H Terrorism and Conflict Resolution - Honors

PEA\_ST 3610 Ireland, 1100s to 1850

PEA\_ST 3611 Ireland, 1850-1923

PEA\_ST 3612 Ireland, 1920-Present

PEA\_ST 4331 Nonproliferation Issues for Weapons of Mass Destruction

#### Area 2: Global Social and Environmental Justice

PEA\_ST 1120 Population and Ecology

PEA\_ST 2000 Exploration in Social and Economic Justice

PEA\_ST 2284 Critical Dialogs: Global Environmental Policy Conflicts

PEA\_ST 3600 Criminology

PEA\_ST 3401 Global Health

#### Area 3: Nonviolent Social Movements, Process, and Change

PEA\_ST 2182 Critical Dialogues: Nonviolence in Peace/ Democracy Movements

PEA\_ST 2285 Large Corporations, Economic Crisis, Social Responsibility

PEA\_ST 3520 Collective Behavior

PEA\_ST 3521 Group Decision Making Processes

PEA\_ST 3522 New Media, Conflict and Control

PEA\_ST 4341 Building Communities from the Grassroots

#### Area 4: Cultures, Intellectuals, And War and Peace

PEA\_ST 2280 Race, Democracy, and Violence in Cuba and Haiti

PEA\_ST 2320 Spanish Literature in Translation

PEA\_ST 3140 Art of War and Peace

PEA\_ST 3400 Politics of the Media

PEA\_ST 3780 World Political Geography

PEA\_ST 4600 Political and Social Philosophy

PEA\_ST 4830 Journalism and Conflict

#### Area 5: Indigenous Peoples, Human Rights, and The Imperial State

REL\_ST 2100 Indigenous Religions

ENGLISH 2490 Introduction to Native Studies

ENGLISH 3490 Native Writing and Representation

GEOG 3560 Native American Geographies

PEA\_ST 4550 Gender and Human Rights in Cross Cultural Perspective

**Other Peace Studies courses counted toward the emphasis requirements** 15

## Semester Plan

Refer to the Semester Plan for the BA in Interdisciplinary Studies (p. 210).

# BA in Interdisciplinary with Emphasis in Women's and Gender Studies

## Major Program Requirements

Interdepartmental Program in the College of Arts and Science

Joan Hermsen, Chair  
 Mary Jo Neitz, Director of Undergraduate Studies  
 325 Strickland Hall  
 (573) 882-2703

Students may earn a Bachelor of Arts in the College of Arts and Science with an Interdisciplinary Studies major and an emphasis in Women's and Gender Studies. A minor is also available as are departmental honors. Please consult the Women's and Gender Studies department for more information.

Advising of students and assistance in designing student-tailored academic plans is available from the Women's and Gender Studies department office.

The curriculum includes Women's and Gender Studies core courses as well as cross-listed courses from several departments throughout the University. These courses assume that knowledge cannot be separated from the study of women and gender, and that gender and sexuality are fundamental categories of analysis in all disciplines. The department stresses interdisciplinary scholarship and teaching that are broadly comparative and range across multiple cultures, national and transnational contexts, and historical periods. Its faculty employ a broad range of theoretical approaches and methods.

When students graduate with an emphasis in Women's and Gender Studies, they should be able to:

- Apply cross-cultural and global awareness to "big questions" about women and gender
- Have a comprehensive grasp of intersectionality and matrices of domination
- Think critically: i.e. consider an issue from multiple perspectives; locate, evaluate and interpret diverse sources, including statistics; engage in critical self-reflection
- Construct arguments with evidence obtained from research
- Work collaboratively
- Recognize sexist/racist writing and thinking
- Connect knowledge and experience, theory and activism, Women's and Gender Studies materials with other courses
- Communicate effectively in writing and speech
- Apply knowledge for social transformation, citizenship
- Use gender (and other identity categories) as a category/ies for analysis

An emphasis in Women's and Gender Studies prepares students for many different employment opportunities. Some fields include arts, business, education, healthcare, policy, media, politics, law, social work and social services. Because of the diversity of Women's and Gender Studies, the WGST emphasis can be combined with a number of other potential majors to create a dual degree. Many students choose to combine two areas of study, such as Women's and Gender Studies and Sociology, or Women's and Gender Studies and Journalism. This results

in a student receiving one degree with two areas of specialization that reflect the student's unique academic interests and his/her individually-designed course of study.

Thirty hours are required in Women's and Gender Studies. In addition to degree requirements, college and university requirements, including university general education requirements, must be met.

Required Core Courses		15
WGST 1120	Bodies, Cultures, and Nations	3
WGST 2010	Gender and Identity: Understanding Intersectionality	3
WGST 2020	Feminist Theory I	3
WGST 3450	Feminist Methodologies	3
WGST 4990	Capstone: Senior Research Seminar in Women's and Gender Studies	3

Additional courses		15
Students take an additional 15 hours selected from the lists of courses below. Students are encouraged to select the bulk of their elective coursework from the first list, Emphasis Core Courses, and must take a minimum of 9 hours from this list. Courses from the third list, Special Semester Topics Courses, may be either Emphasis Core Courses or Cross-listed Courses. Please seek advise from the department on which requirement these courses fulfill. 12 hours must be at 2000 level or above.		

Emphasis Core Courses		
WGST 2030	Gender Perspectives: Colonial Histories, Post-Colonial Challenges	3
WGST 2040	Perspectives on Women's Empowerment	3
WGST 2050	Gender Perspectives: Issues in Public Health	3
WGST 2080	Perspectives on Sexual and Gender Diversity	3
WGST 2250	Perspectives on Gender, Race, Class and Sexuality in the Americas	3
WGST 2260	Perspectives on Mass Media: Constructions of Gender, Race and Sexuality	3
WGST 2340	Perspectives on Gender and Popular Culture	3
WGST 2960	Sexual Health Advocacy and Service Learning	3
WGST 3080	Sexuality and Gender Theory	3
WGST 3230	Themes in Sexual Politics	3
WGST 3240	Nonprofit Work and the Pursuit of Social Justice	3
WGST 3370	Themes in Gender, Religion and Spirituality	3
WGST 3480	Themes in Sexuality and Literature	3
WGST 3560	Themes in Gender and Immigration	3
WGST 3670	Themes in Gender and Globalization	3
WGST 3850	Themes in Gender and the Politics of Representation	3
WGST 3960	Strategies for Effective Peer Education	1
WGST 4020	Studies in Feminist Thought	3
WGST 4110	Feminist Research and Criticism	3
WGST 4230	Women, Development, and Globalization	3
WGST 4420	Studies in Gender, Culture, and Politics	3
WGST 4550	Gender and Human Rights in Cross Cultural Perspective	3
WGST 4600	Studies in Women and Health	3
WGST 4640	Studies in Gender and Performance	3

WGST 4940	Internship in Women's and Gender Studies	1-12
WGST 4965	Special Readings in Women's and Gender Studies	1-6

**Cross-listed Courses:**

AR_H_A 4120	Women, Art and Society	3
ANTHRO 4370	Anthropology of Gender	3
ENGLISH 2180	Introduction to Women's Literature	3
ENGLISH 2200H	Studies in British Literature - Honors	3
ENGLISH 3180	Survey of Women Writers	3
ENGLISH 4180	Major Women Writers	3
ENGLISH 4181	Themes in Literature by Women	3
ENGLISH 4480	Major African Diaspora Women Writers	3
ENGLISH 4780	Women's Folklore and Feminist Theory	3
FRENCH 2370	French Women Writers (in translation)	3
HIST 2400	Social History of U.S. Women	3
HIST 2410	African American Women in History	3
HIST 3220	U.S. Women's Political History, 1880-Present	3
HIST 3430	Sex Radicals in U. S History	3
HIST 3570	European Women in the 19th Century	3
HIST 4310	Adoption, Child Welfare and the Family, 1850-Present	3
HIST 4660	European Women in the 20th Century	3
JOURN 4716	Women and the Media	2
PHIL 2500	Philosophy and Gender	3
POL_SC 4730	Women and Politics	3
REL_ST 3750	Women and Religions	3
REL_ST 4750	Women, Religion and Culture	3
RUSS 3870	Russian Women and Film	3
SOC_WK 4400	Domestic Violence	3
SOCIOLOG 1360	The Female Experience: Body, Identity, Culture	3
SOCIOLOG 3300	Queer Theories/Identities	3
SOCIOLOG 3320	Sociology of Gender	3

**Special Semester Topics Courses**

WGST 1001	Topics in Women's and Gender Studies-General	1-3
WGST 1003	Topics in Women's and Gender Studies-Behavioral	1-3
WGST 1004	Topics in Women's and Gender Studies-Social Science	1-3
WGST 1005	Topics in Women's and Gender Studies-Humanities	1-3
WGST 2001	Topics in Women's and Gender Studies-General	1-3
WGST 2003	Topics in Women's and Gender Studies-Behavioral	1-3
WGST 2004	Topics in Women's and Gender Studies-Social Science	1-3
WGST 2005	Topics in Women's and Gender Studies-Humanities	1-3
WGST 3001	Topics in Women's and Gender Studies-General	1-3
WGST 3003	Topics in Women's and Gender Studies-Behavioral Sciences	1-3
WGST 3004	Topics in Women's and Gender Studies-Social Sciences	1-3

WGST 3005	Topics in Women's and Gender Studies-Humanities	1-3
WGST 4001	Topics in Women's and Gender Studies-General	1-3
WGST 4003	Topics in Women's and Gender Studies-Behavioral Sciences	1-3
WGST 4004	Topics in Women's and Gender Studies-Social Sciences	1-3
WGST 4005	Topics in Women's and Gender Studies-Humanities	1-3
WGST 4873	Women's and Gender Studies Abroad - Behavioral Science	3
WGST 4874	Women's and Gender Studies Abroad - Social Science	3
WGST 4875	Women's and Gender Studies Abroad - Humanities	3

## Semester Plan

First Year			
Fall	Credits	Spring	Credits
WGST 1120	3	WGST 2010	3
ENGLISH 1000	3	Foreign Language	5
Social Science (MO State Law)	3	MATH 1100	3
Foreign Language	5	General Elective	3
	<b>14</b>		<b>14</b>

Second Year			
Fall	Credits	Spring	Credits
WGST Major Course	3	WGST 2020	3
Science with a Lab	5	Minor	3
Foreign Language	3	Humanities/Fine Arts (Writing Intensive)	3
Behavioral Science	3	Behavioral Science	3
Social Science	3	Science	3
	<b>17</b>		<b>15</b>

Third Year			
Fall	Credits	Spring	Credits
WGST 3450	3	WGST Major Course	3
WGST Major Course	3	Minor	3
Minor	3	Humanities/Fine Arts	3
Science (Math Reasoning Proficiency)	3	Social Science	3
General Elective	3	General Elective	3
	<b>15</b>		<b>15</b>

Fourth Year			
Fall	Credits	Spring	Credits
WGST Major Course	3	WGST 4990	3
WGST Major Course	3	Minor	3
Minor	3	Humanities/Fine Arts	3
Humanities/Fine Arts	3	General Elective	3

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General Elective	3	General Elective	3
	15		15
Total Credits: 120			

## International Studies

Office of Special Degree Programs  
 College of Arts and Science  
 114 Switzler Hall  
 (573) 882-6060

### Faculty

**Professor** T. Tarkow  
**Instructor** M. S. Malone  
**Lecturer** J. Chung

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 216)
- BA in International Studies (p. 216)
  - with emphasis in East Asian Studies (p. 217)
  - with emphasis in European Studies (p. 218)
  - with emphasis in International Business (p. 218)
  - with emphasis in Latin American Studies (p. 218)
  - with emphasis in Peace Studies (p. 218)
  - with emphasis in South Asian Studies (p. 219)
  - with emphasis in Environmental Studies (p. 218)

Interdisciplinary programs provide for the special needs and interests of individual students who are not being served by one of the existing majors. The Office of Special Degree Programs is responsible for a variety of multidisciplinary majors, including Interdisciplinary Studies, International Studies and General Studies.

### Major in International Studies

The major is comprised of three 12-credit blocks, plus electives, as described below. At least 30 credits must be at the 2000 level or higher; 18 must be taken in courses at the 3000-level or higher.

#### Humanities and language

Could include additional language and literature courses from the language of major study, as well as course work from Philosophy, Religious Studies, Art History and Archeology, and Civilization courses. 12

#### Social and behavior sciences

Could include course work from Geography, History, Political Science, Economics, Anthropology, Sociology, Rural Sociology or Peace Studies. 12

#### Focus area

Course work from an area of the student's choice allowing the study of one area in depth. Students are encouraged to take 9 credits from a single department or area. The 3-credit capstone experience will equal 12 hrs. of credit. (See previous information on capstone requirement.)

### Study Abroad Experience

Students majoring in International Studies must study abroad for a minimum of four weeks. Prior to their overseas studies participation, students must have completed at least one course related to the country in which they plan to study.

### Dual Majors (International Business)

International Business is offered as a dual major program leading to the Bachelor of Science in Business Administration with an emphasis in International Business and a BA in International Studies. See the College of Business for more information.

### Graduate

While the College does not offer a graduate degree specific to international studies, the Graduate School does offer a graduate academic Minor in International Development (p. 639).

This catalog provides a complete list of graduate degree options (p. 5) for all Schools and Colleges at the University of Missouri.

## Undergraduate

### Department Level Requirements - International Studies

There are no requirements at the department level for this degree. Please see the BA in International Studies (p. 216) page for degree requirements.

### BA in International Studies

#### Major Program Requirements

The International Studies major is a broad multidisciplinary program of liberal studies with a strong intercultural and international focus. The program provides a variety of regional/cultural and inter-divisional emphasis areas, including East Asian Studies, Environmental Studies, European Studies, Latin American Studies, Peace Studies and South Asian Studies.

Designed to accommodate preprofessional interests as well as provide a sound foundation for more advanced study at the graduate level, this degree may be especially attractive for students planning to pursue careers in international business, trade and diplomacy, international law, technical assistance and humanitarian relief and similar fields.

The major includes a common interdisciplinary core of 18 designated credits that students earn as part of their degree requirements. In addition, all International Studies students must take a minimum of 6 credits in foreign language study beyond the 12-13 credit minimum skills proficiency requirement of the College of Arts and Science. This requires a minimum of 18 credits. Given the rigorous requirements of this



program, students should begin planning their course of study in their first semester.

International Studies degree candidates must earn no less than a 2.0 GPA in their upper-class (numbered 3000 or higher) foreign language courses, emphasis area and area support components. Students must also complete all degree, college and University graduation requirements, including University general education.

Requirements are similar to those for other majors earning BA degrees in the College of Arts and Science, except that International Studies students must complete an 18-credit common core of courses as part of these requirements.

**Major core requirements**

ANTHRO 2030	Cultural Anthropology	3
GEOG 1100	Regions and Nations of the World I	3
or GEOG 1200	Regions and Nations of the World II	
POL_SC 1400	International Relations	3
or POL_SC 2700	Comparative Political Systems	
Select three of the following (at least one must be a humanities course):		9

PEA_ST 1050	Introduction to Peace Studies	
BIO_SC 1060	Basic Environmental Studies	
ECONOM 1014	Principles of Microeconomics	
or ECONOM 1015	Principles of Macroeconomics	
or AG_EC 1041	Applied Microeconomics	
GEOL 1200	Environmental Geology with Laboratory	
or GEOL 1100	Principles of Geology with Laboratory	
SOCIOL 1000	Introduction to Sociology	
SOCIOL 2200	Social Inequalities	

The following are humanities courses:

REL_ST 2100	Indigenous Religions	
REL_ST 2110	Religions of the World	
REL_ST 2310	Religions of China and Japan	
PHIL 2100	Philosophy: East and West	
AR_H_A 1110	Ancient and Medieval Art	
AR_H_A 1120	Renaissance through Modern Art	
MUSIC_NM 1310	Masterpieces of Western Music	
MUSIC_NM 1313	Introduction to World Music	
GN_HON 2112H	The Middle Ages and the Renaissance	
GN_HON 2113H	The Early Modern World: The 17th-19th Centuries Enlightenment	
GN_HON 2114H	The Modern Era	
PHIL 2410	Philosophies of War and Peace	

**Foreign language**

Two language courses beyond the basic 12-13 credit minimum skills proficiency requirement (total: 18-19 credits in a single language) 6

**Capstone requirement** (to be completed during final 45 hours of course work)

There are several ways a student can complete the capstone experience in international studies. Select one option:

1. **Special Readings project:** With this option, the student completes an independent research project under the supervision of a faculty member. Most projects result in a 15-20 page research paper. The project allows the student to explore an area of interest and is designed to be an academic challenge. The department is open to creative, innovative approaches to learning. The supervising faculty member is responsible for grading the project. The student is responsible for locating a supervising faculty member.
2. **Service Learning project.** Students will engage in service activities, directly relevant to their areas of academic emphasis, in community not-for-profit agencies. At the same time as participants work in the community, they will research their agency and organization, undergo mock employment interviews, create a cover letter and resume based on the professional skills they have gained through their service, and reflect on careers and leadership in public service. The course will be submitted for Writing Intensive credit each semester. Restricted to Interdisciplinary, General and International Studies students.
3. **Internship:** Students work approximately 50 clock hours per credit per semester at an agency, company or corporation of their choice. Grades are on a pass-fail basis. For an internship to be approved as a capstone experience, it must help the student solidify and explore the areas of concentration. Internships must have prior approval from the International Studies advisor.
4. **Capstone course:** Students may have a specific course designated as a capstone course for the individual degree program. This can be a course designated by a department or a course that serves the student well as a capstone course. The course must be 4000 level, and the course must be taken in the last 45 hours of course work as a major. A course taken previously cannot retroactively be counted as a capstone course. Approval for the course must be provided in advance of registration from the International Studies advisor.

**Semester Plan**

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

**BA in International Studies with Emphasis in East Asian Studies**

**Major Program Requirements**

East Asian Studies is one of the emphasis areas in the International Studies major. The program is multidisciplinary, encompassing course work from the departments of Geography, History, Anthropology, Religious Studies, Political Science and Philosophy, as well as in Chinese, Japanese and Korean. The program focuses on creating an understanding and awareness of the culture, history, politics, geography and languages of the East Asian countries, with an emphasis in China, Japan or Korea. Students are encouraged to begin study of their foreign language no later than the sophomore year. Students should consult with

the International Center about appropriate locations for their study abroad experience.

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in International Studies with Emphasis in Environmental Studies

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### Major Program Requirements

Refer to the program requirements for the BA in International Studies (p. 216).

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in International Studies with Emphasis in European Studies

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### Major Program Requirements

European studies is an emphasis area in the International Studies major. Students who are studying French, Spanish, German, Italian or Russian may wish to select European studies as their emphasis area. The student examines the politics, culture, history and geography of the European continent, with a focus on the country whose native language is being studied by the student. Given the multidisciplinary approach to this degree, students take courses that are specifically geared to a better understanding of the culture, history, and language of a given country, as well as a better understanding of the entire continent of Europe. Refer to the program requirements for the BA in International Studies (p. 216).

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in International Studies with Emphasis in International Business

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### Major Program Requirements

Refer to the program requirements for the BA in International Studies (p. 216).

## Semester Plan

Refer to the Semester Plan for the BA in International Studies (p. 216).

## BA in International Studies with Emphasis in Latin American Studies

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### Major Program Requirements

Latin American Studies is offered as an emphasis area for the BA in International Studies. The Latin American Studies option is designed to offer, in addition to linguistic competency in Spanish or Portuguese, a broad base of knowledge about Latin American politics, literature, economics and culture.

This field of inquiry, alone or in combination with another discipline, is in high demand throughout the world and can provide students with an indisputable competitive edge in the contemporary professional arena. Students who graduate with an emphasis in Latin American Studies will be fully prepared to pursue graduate study in Latin American Studies programs offered around the country.

Students are encouraged to study abroad in one of many program opportunities in Spain, Mexico, Central and South America, Brazil or the Caribbean. It is important to begin planning an emphasis area with a member of the Latin American studies committee as early as feasible, during the freshman year if possible. An advisor can tailor a program to fit specific interests.

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in International Studies with Emphasis in Peace Studies

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### Major Program Requirements

Students may opt for an emphasis in Peace Studies. Students with this emphasis examine issues related to global peace and social justice - in the international arena. The emphasis in Peace Studies helps prepare students for employment, volunteer assignments, and graduate study in such areas as conflict resolution, human rights, humanitarian assistance, sustainable development, social justice, nonviolent social change, indigenous peoples, and the understanding of global cultural diversity. The program at MU promotes interdisciplinary initiatives and research about migration and exile, and digital technology and civil liberties. Any course cross listed with the Peace Studies program may be counted toward the Peace Studies emphasis in International Studies. PEA\_ST 1050 Introduction to Peace Studies is required. Online writing-intensive versions of 1050 are available.

It is recommended that courses for the Peace Studies component area be drawn from the following list and distributed through several of the five areas below.

**Area 1: International and Civil War and Peace**

PEA_ST 2200	Nuclear Weapons: Environmental, Health and Social Effects	3
PEA_ST 2410	Philosophies of War and Peace	3
PEA_ST 3230H	Terrorism and Conflict Resolution - Honors	3
PEA_ST 3610	Ireland, 1100s to 1850	3
PEA_ST 3611	Ireland, 1850-1923	3
PEA_ST 3612	Ireland, 1920-Present	3
PEA_ST 4331	Nonproliferation Issues for Weapons of Mass Destruction	3

**Area 2: Global Social and Environmental Justice**

PEA_ST 1120	Population and Ecology	3
PEA_ST 2000	Exploration in Social and Economic Justice	3
PEA_ST 2284	Critical Dialogs: Global Environmental Policy Conflicts	3
PEA_ST 2285	Large Corporations, Economic Crisis, Social Responsibility	3
PEA_ST 3401	Global Health	3
PEA_ST 3600	Criminology	3
PEA_ST 3870	Social Revolution in Latin America	3

**Area 3: Nonviolent Social Movements, Process, and Change**

PEA_ST 2182	Critical Dialogues: Nonviolence in Peace/ Democracy Movements	3
PEA_ST 3520	Collective Behavior	3
PEA_ST 3521	Group Decision Making Processes	3
PEA_ST 3522	New Media, Conflict and Control	3
PEA_ST 4341	Building Communities from the Grassroots	3

**Area 4: Cultures, Intellectuals, and Global Migration**

PEA_ST 2280	Race, Democracy, and Violence in Cuba and Haiti	3
PEA_ST 2320	Spanish Literature in Translation	3
PEA_ST 3140	Art of War and Peace	2-3
PEA_ST 3400	Politics of the Media	3
PEA_ST 3780	World Political Geography	3
PEA_ST 4600	Political and Social Philosophy	3
PEA_ST 4830	Journalism and Conflict	3

**Area 5: Indigenous Peoples, Human Rights, and The Imperial State**

PEA_ST 2100	The Vietnam and Iraq Wars: Lessons for the Future	3
PEA_ST/ ENGLISH 2490	Introduction to Native Studies	3
PEA_ST/ ENGLISH 3490	Native Writing and Representation	3
GEOG 3560	Native American Geographies	3
PEA_ST 4550	Gender and Human Rights in Cross Cultural Perspective	3

**Semester Plan**

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BA in International Studies with Emphasis in South Asian Studies

### Major Program Requirements

The South Asian Studies emphasis offers courses in history, politics, philosophy, religion, culture, social life and languages of India. It thus provides the opportunity for study of an ancient and extensive civilization with a significant role in human history.

An emphasis in South Asian Studies prepares students to enter MA and PhD programs in this area of specialization, which often provide intensive summer language programs. An advanced degree opens a variety of professional and job opportunities for those planning to work in such fields as international business, trade and diplomacy, international law or agricultural development, among others.

### Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## Linguistics

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Vicki Carstens, Chair  
Interdepartmental Program in the College of Arts and Science  
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Linguistics is the scientific study of human language. It seeks to understand and explain the properties of language in a clear and formal manner. Linguists document understudied and endangered languages, explore the consequences of language contact, measure language variation and change, investigate the structure of language, and analyze the construction of meaning.

Some of the main subfields of linguistics are phonetics (the physical properties of sounds), phonology (the grammar of sounds), morphology (the structure of words), syntax (the organization of phrases and sentences), semantics (meaning), and sociolinguistics (the interaction of language and society).

A Bachelor of Arts with a major in linguistics is available (with an honors option) as is a linguistics minor, both involving coursework in the various subfields.

The study of linguistics prepares students for careers which utilize insight into the workings of language including language instruction, translation and interpreting, speech pathology, anthropology, the reconstruction of prehistory, and computational fields related to the interaction of language and technology. Academic careers of linguistic research and teaching are also possible after further training at the graduate level.

In addition, a major in linguistics offers students a liberal education and develops verbal and analytical skills that are valuable in a variety of less directly related careers such as journalism, literary study, and the law.

The linguistics program is staffed by faculty from a number of MU departments. Supporting course work is offered in Anthropology, Black Studies, Classical Studies, Communication, Communication Science and Disorders, the College of Education, English, German and Russian Studies, Psychology, Philosophy, Romance Languages and Literatures, and South Asian Studies.

Although specialists in the field commonly know one or more foreign languages, such knowledge is complementary rather than essential.

## Faculty

**Professors:** , P. Weirich\*, J. Zemke\*, F. Zéphir\*

**Associate Professors:** V. Carstens\*, J. Goodman\*, M. Gordon\*, C. Horisk\*, M. McGrath\*, P. Robbins\*, T. Kazic\*

**Assistant Professors:** A. Alcazar\*, M. Fagan\*, J. Kramer\*, M. Marlo\*, M. Popescu\*

**Emeritus Faculty:** L. Day\*, N. L. Furbee\*, D. E. Gulstad, B. L. Honeycutt, M-J Smythe, D. Watson, G. Youmans\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Departmental Level Requirements (p. 221)
- BA in Linguistics (p. 221)
- Minor in Linguistics (p. 222)

## Graduate

Interdepartmental Program in the College of Arts and Science  
224 Tate Hall  
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carstensv@missouri.edu

**Chair of Linguistics:** Vicki Carstens

- Graduate Minor in Linguistics (p. 222)

A graduate minor in linguistics consists of at least 12 hours including two electives and two required courses: LINGST 7630 (Phonology) and LINGST 7640 (Syntax). Electives are to be drawn from our list of upper level linguistics classes (see [linguistics.missouri.edu/courses](http://linguistics.missouri.edu/courses)).

Graduate degrees in linguistics are not offered but MA and PhD programs with emphasis in language and linguistics are available in some cooperating departments such as Anthropology, communication, English, Romance Languages and Literatures, and Philosophy).

The linguistics area program is staffed by faculty from various departments (see below). Supporting course work may be drawn from a range of units including Anthropology, Black Studies, Classical Studies, Communication, Communication Science and Disorders, the College of Education, English, German and Russian Studies, Psychology, Philosophy, Romance Languages and Literatures, and South Asian Studies.

Financial aid, when available, is arranged through the participating departments.

## Cooperating Graduate Degree Programs

Anthropology (p. 133)

Interested Anthropology and other graduate students may minor in Linguistics. Linguistics is an integral component of ethnographic research.

Communication (p. 165)

In the Department of Communication, students learn to apply the study of communication to their professional and personal lives. Students may receive a MA, or PhD through this department.

Communication Science and Disorders (p. 471)

The discipline of Communication Science and Disorders encompasses the field of speech, language, and hearing science and the distinct but related professions of Speech-Language Pathology and Audiology. Students may receive a MA, or PhD through this department.

English (p. 179)

The English department offers MA and PhD degrees with an emphasis in English Language and Linguistics.

Philosophy (p. 247)

Linguistics majors benefit by taking courses offered by the Philosophy Department and can focus on issues at the intersection of philosophy and linguistics.

Romance Languages and Literatures (p. 271)

The Department of Romance Languages and Literatures offers the MA with an emphasis on Language Teaching (MALT).

## Undergraduate

### Department Level Requirements - Linguistics

#### Departmental Honors

A student wishing to graduate with honors in Linguistics must earn a 3.3 GPA in all courses and complete all the requirements for the BA in Linguistics. In addition, with the assistance of his/her honors thesis advisor, the student must develop, plan and conduct research on an independent project, normally while enrolled in LINGST 4991 (p. 220). A committee consisting of the thesis advisor and a second reader, to be selected by the advisor and the program chair, will examine the student on the resulting thesis of 25-40 pages in an oral exam held no later than the thirteenth week of the term during which the student expects to graduate. The second reader will be provided with a copy of the thesis at least two weeks before the examination. After completing any revisions that the exam committee recommends, the student will submit a final version of the thesis for linguistics program records and will then be recommended to the college of Arts and Science for a BA with Honors in Linguistics.

#### BA in Linguistics

#### Major Program Requirements

Major core requirements (minimum) 21

##### I. Required areas/courses

Introduction to Linguistics 3

LINGST 1060 Human Language

Language Structure - At least one in-depth structure course such as: 3

LINGST 4600 Structure of American English

LINGST 4720 Structure of Modern French

LINGST 4721 Structure of Modern Spanish

Phonology 3

LINGST 4630 Phonology (typically offered Spring semesters)

Syntax 3

LINGST 4640 Syntax (typically offered Fall semesters; a structure course prerequisite)

Semantics 3

Select one of the following:

LINGST 2700 Elementary Logic

LINGST 4100 Philosophy of Language

LINGST 4110 Advanced Logic

##### II. Electives

At least one additional course from any part of the linguistics curriculum, including but not limited to those listed above and below 3

##### Language variation

LINGST 4620 Regional and Social Dialects of American English

LINGST 4722 Spanish Across the Continents

LINGST 4723 Language and Society: Spanish in the U.S.

##### Language and Culture

LINGST 3470 Culture as Communication

LINGST 4412 Gender, Language and Communication

##### Historical Linguistics and Language Change

LINGST 4200 Introduction to Old English

LINGST 4610 History of the English Language

LINGST 4710 History of the French Language

LINGST 4711 History of the Spanish Language

##### Phonetics

LINGST 3010 American Phonetics

LINGST 3220 Speech Acoustics

LINGST 3210 Anatomy and Physiology of the Speech Mechanism

LINGST 3220 Speech Acoustics

LINGST 3721 Spanish Phonetics

##### Language and the Mind

LINGST 2820 Introduction to Cognitive Science

LINGST 4810 Psycholinguistics

##### III. Capstone Course 3

LINGST 4870 Field Methods in Linguistics

#### Options

Topics courses such as LINGST 2001, LINGST 3001 and LINGST 4001 may also satisfy core requirements. Substitutions may be approved for courses in one of the required areas if no courses are available in that area during a student's senior year.

#### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
LINGST 1060	3	Foreign Language	5
ENGLSH 1000	3	MATH 1100	3
Social Science (MO State Law)	3	Behavioral Science	3
Foreign Language	5	General Elective	3
	14		14
Second Year			
Fall	Credits	Spring	Credits
LINGST 2700 or PHIL 2700	3	Linguistics Elective	3
Behavioral Science	3	Minor	3
Foreign Language	3	Humanities/Fine Arts (Writing Intensive)	3
Social Science	3	Science with a Lab	5

General Elective	3	General Elective	3
	<b>15</b>		<b>17</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LINGST 4600, 4720, or 4721	3	LINGST 4630	3
Minor	3	Minor	3
Humanities/Fine Arts	3	Humanities/Fine Arts	3
Science	3	Science	3
General Elective	3	General Elective	3
	<b>15</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LINGST 4640	3	LINGST 4870	4
Minor	3	Minor	3
Social Science	3	Humanities/Fine Arts	3
General Elective	3	General Elective	3
General Elective	3	General Elective	3
	<b>15</b>		<b>16</b>
Total Credits: 121			

## Minor in Linguistics

The minor in linguistics requires at least 15 credits of linguistic courses. They may be drawn from any part of the linguistics curriculum.

## Graduate

### Graduate Minor in Linguistics

#### Completion Requirements for the Graduate Minor in Linguistics

A graduate minor field in linguistics is available to graduate students. It is comprised of 12 hours, two courses of which are required and two are to be selected from a list of upper level linguistics classes:

**Required:**

LINGST 7630	Phonology	3
LINGST 7640	Syntax	3

**Sample list from which two additional courses will be selected (appropriate substitutes may be accepted at the discretion of the chair):** 6-7

LINGST 7420	Historical Linguistics
LINGST 7415	Language and Discourse
LINGST 7600	Structure of American English
LINGST 7610	History of the English Language
LINGST 7620	Regional and Social Dialects of American English
LINGST 7400	Language and Culture
LINGST 7870	Field Methods in Linguistics

Total Credits 12-13

## Mathematics

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Glen R. Himmelberg, Chair  
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### Faculty

**Professor** I. M. Aberbach\*\*, M. S. Ashbaugh\*\*, N. Asmar\*\*, W. D. Banks\*\*, P. Casazza\*\*, C. C. Chicone\*\*, T. Christiansen\*\*, S. D. Cutkosky\*\*, S. Dostoglou\*\*, D. S. Edidin\*\*, F. Gesztesy\*\*, L. Grafakos\*\*, A. D. Helfer\*\*, S. Hofmann\*\*, A. Koldobsky\*\*, Y. Latushkin\*\*, Y. Li\*\*, K. A. Makarov\*\*, D. I. Mitrea\*\*, M. Mitrea\*\*, S. Montgomery-Smith\*\*, M. M. H. Pang\*\*, D. H. Pettey\*, Z. Qin\*\*, H. Srinivasan\*\*, A. Tsoi\*\*, I. Verbitsky\*\*, S. Wang\*\*, Q. Zhang\*\*

**Associate Professor** A. Harcharras\*\*, C. Morpurgo\*\*, J. Segert\*, D. T. Weston\*\*

**Assistant Professor** C. Chindris\*\*, M. Munn\*\*, P. Pivovarov\*\*, S. Takeda\*\*

**Business Mathematics Coordinator** J. Aubrey

**Calculus Coordinator** A. Clayton

**College Algebra Coordinator** T. E. Christiansen

**Professor Emeritus** J. Beem\*, R. Crownover, J. Lange\*, I. J. Papick\*, C. Petty\*, J. Reeder, E. Saab\*, P. Saab#, D. Sentilles\*, Z. Zhao\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 224)
- BA in Mathematics (p. 224)
- BS in Mathematics (p. 225)
  - with emphasis in Actuarial Science and Mathematical Finance (p. 225)
- Minor in Mathematics (p. 226)

The Department of Mathematics offers a major with either a Bachelor of Arts or a Bachelor of Science degree. Within the BS degree, an emphasis in Actuarial Science and Financial Mathematics is available. Both the BA and BS degrees will prepare a student for a graduate program in Mathematics.

### Preparation for Graduate Study in Mathematics

Students satisfying the requirements for either the BA or the "traditional" BS will have the basic preparation for a graduate program in Mathematics. A student considering graduate work, however, should take additional coursework. Because of this, a BS degree would be considered preferable. Those students in the Actuarial Science area considering graduate work should take MATH 4720 as part of their program. Those students getting a dual degree in Mathematics and Mathematics Education considering graduate work in mathematics

should choose to take both MATH 4700 and MATH 4720 as part of their program.

Courses recommended for students planning to pursue graduate studies in pure mathematics: MATH 4400, MATH 4500, MATH 4900, MATH 4920, and MATH 4940.

Courses recommended for students planning to pursue graduate studies in applied mathematics: MATH 4300, MATH 4310, MATH 4315, MATH 4320, MATH 4500, MATH 4540, MATH 4940.

### Departmental Honors

#### Eligibility

To become a candidate for the BA or BS degree with a major in Mathematics with departmental honors, a student must have a cumulative grade point average that meets the Honors College standards. At present, students with a GPA of 3.30 or higher are automatically eligible to enter the departmental honors programs.

#### Requirements

To graduate with departmental honors in mathematics, a student must satisfy the regular BA or BS degree requirements and must have a GPA of 3.5 or higher in all Mathematics Department courses. In addition, the student must have at least 26 credits in mathematics courses numbered 4000 or above. Furthermore, the student must complete one of the two options listed below.

#### Option 1: Honors Thesis

The student must write an honors thesis in conjunction with a mentorship or in conjunction with MATH 4996. This option requires that the student enroll in MATH 4996.

#### Option 2:

The student's program of study must include MATH 4700, MATH 4900, MATH 4720 and MATH 4920.

### Graduate

College of Arts and Science  
202 Mathematical Sciences Building  
573-882-6221

<http://www.math.missouri.edu/degrees/graduate/index.html>

**Director of Graduate Studies:** Dan Edidin

- MA in Mathematics (p. 226)
- MS in Applied Mathematics (p. 227)
- MST in Mathematics (p. 229)
- PhD in Mathematics (p. 230)

### About Mathematics

The Graduate Program in Mathematics is large enough to encompass research and courses in many areas, yet small enough to remain responsive to the needs of individual students. There are approximately 80 graduate students, 40 professors, and 15 postdoctoral and visiting researchers. The active areas of research include: algebraic geometry, analysis (real, complex, functional and harmonic), analytic functions, applied mathematics, financial mathematics and mathematics of insurance, commutative rings, scattering theory, differential equations (ordinary and partial), differential geometry, dynamical systems, general

relativity, mathematical physics, number theory, probabilistic analysis and topology.

The Mathematical Sciences Building houses a library with more than 34,000 volumes and 430 journal titles. MU students have access to an extensive array of computing resources.

## Admission Notice

Applicants for any graduate degree in mathematics should submit an application for graduate study. Admission to the graduate program does NOT guarantee admission to the Ph.D. program. International Applicants applying from outside North America who seek financial support from the Department will only be considered for the PhD program.

## Financial Aid from the Program

All domestic applications for admission are automatically considered for financial support, in most cases by Teaching Assistantships. Virtually all current students are supported financially. Scholarships, assistantships, fellowships and other sources of aid are available.

The Department Research Fellowship, the Blumenthal Scholarship and the McFarlan Fellowship are administered by the department, while the Huggins Scholarship, Gregory Fellowship and Ridgel Fellowship are administered by the university.

International applications with TOEFL of 85 or higher (or equivalent) will also be automatically considered for departmental financial support.

## Undergraduate

### Department Level Requirements- Mathematics

Students may apply to be Math majors upon meeting the following criteria:

- Completion of ENGLISH 1000 and MATH 2300
- Both cumulative GPA and GPA in Math courses numbered 1500 and above (except for 2100) of 2.5 or above.

All math courses required for the degree must be passed with a grade of C- or above.

#### Core Math Requirements for all Math degrees (24 credits)

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 3000	Introduction to Advanced Mathematics	3
MATH 4100	Differential Equations	3
MATH 4140	Matrix Theory	3
CMP_SC 1040	Introduction to Problem Solving and Programming	3
or CMP_SC 1050	Algorithm Design and Programming I	
<b>Total Credits</b>		<b>25</b>

## BA in Mathematics

### Major Program Requirements

All MU General Education (p. 18) and Arts and Science Breadth and Depth requirements (for the BA) must be satisfied, in addition to the Department Level Requirements (p. 224). The foreign language requirement must be satisfied either by taking a foreign language for 4 years in high school or by completing a language sequence at MU.

### Additional requirements for the BA degree

- MATH 4700 Advanced Calculus of One Real Variable I
- MATH 4720 Introduction to Abstract Algebra I
- Four approved 4000 level Math electives

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
Humanities/Fine Arts Course	3	Foreign Language (Level I)	5
ENGLISH 1000	3	Humanities/Fine Arts Course	3
HIST 1100, 1200, or POL_SC 1100	3	Biological/Physical/Mathematical Science Course (Not taught by the Math Department)	4
Elective Course			
	14		17
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
CMP_SC 1040 or 1050	3	MATH 4140	3
Foreign Language (Level II)	5	Foreign Language (Level III)	3
Humanities/Fine Arts Course	3	Biological/Physical/Mathematical Science Course (Not taught by the Math Department)	3
Elective Course	3	BIO SC course	3
	17		15
Third Year			
Fall	Credits	Spring	Credits
MATH 3000	3	MATH 4700	3
4000-level MATH elective	3	4000-level MATH elective	3
4000-level MATH elective	3	Social Science Course (in a field different from the History or Political Science Course taken in Fall I)	3
Biological/Physical/Mathematical Science Course (Not taught by the Math Department)	3	Elective Course	3
Elective Course	3	Elective Course	3
	15		15



Fourth Year			
Fall	Credits	Spring	Credits
MATH 4720	3	4000-level Math Elective	3
Behavioral Science Course 2000-level	3	Humanities/Fine Arts Course 2000-level	3
Humanities/Fine Arts Course	3	Social Science Course	3
Social Science Course	3	Elective Course	3
Elective Course	3		
	15		12
Total Credits: 120			

## BS in Mathematics

### Major Program Requirements

The Mathematics Department offers a "Standard" BS, a BS with emphasis in Actuarial Science and Mathematical Finance, and a Dual Degree in Mathematics and Mathematics Education. In each case all MU General Education (p. 18) and Arts and Science Breadth and Depth requirements (for the BS) must be satisfied, in addition to the Department Level Requirements (p. 224). Note that the courses accepted for the science requirement by the Mathematics department are more restrictive than the Arts and Science requirement.

All BS degrees require completion of the Foreign Language requirement by one of: four years of a language in high school, completion of a foreign language sequence at MU, or a Foreign Language Alternative (12 credits at the 2000 level or above in an area, or related areas, approved by the Director of Undergraduate Studies).

### Additional requirements for the BS degree

- MATH 4700
- MATH 4720
- Four approved 4000 level Math electives
- Science Requirement: 13 or more credits from the two groups below. Both groups must be represented.

Group I:

PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	
CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5

Group II: Any 4000 level courses in Statistics or Computer Science.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
HIST 1100 or POL_SC 1100 *	3	Behavioral Science Elective Course *	3
Humanities/Fine Arts Elective Course *	3	Humanities/Fine Arts Elective Course *	3

ENGLISH 1000 *	3	CMP_SC 1040 or 1050	3
	14		14

Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
2000-level General Education Elective	3	MATH 3000	3
PHYSICS 2750	5	PHYSICS 2760	5
SPAN 1100	5	SPAN 1200	5
	16		16

Third Year			
Fall	Credits	Spring	Credits
MATH 4700	3	MATH 4720	3
MATH 4140	3	4000-level MATH Course	3
Writing Intensive Elective Course *	3	2000-level General Education Elective *	3
SPAN 2100	3	Humanities/Fine Arts Course	3
Elective Course	3	Elective Course	3
	15		15

Fourth Year			
Fall	Credits	Spring	Credits
4000-level MATH course	3	4000-level MATH course	3
4000-level Course in STAT or CMP SC	3	4000-level MATH course	3
4000-level MATH course	3	Elective Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
	15		15
Total Credits: 120			

## BS in Mathematics with Emphasis in Actuarial Science and Mathematical Finance

### Major Program Requirements

Students must complete the MU general education (p. 18) requirements and the Department Level Requirements (p. 224) in addition to the degree requirements listed below.

This emphasis area will serve those who want to pursue a career in the financial and insurance industries. It will also help BS students to prepare for their first actuarial exams. Those students considering further graduate work in Mathematics should also take

MATH 4700	Advanced Calculus of One Real Variable I	3
MATH 4355	Investment Science I	3
MATH 4370	Actuarial Modeling I	3
MATH 4371	Actuarial Modeling II	3
MATH 4315/STAT 4710	Introduction to Mathematical Statistics	3
MATH 4320/STAT 4750	Introduction to Probability Theory	3

MATH 4520/	Statistical Inference I	3
STAT 4760		

**Additional course requirements:**

STAT 4870	Time Series Analysis	3
STAT 4510	Applied Statistical Models I	3
ECONOM 1014	Principles of Microeconomics	3
ECONOM 1015	Principles of Macroeconomics	3

**Science requirement: 5 or more credits from Group I courses (see above)**

**The following courses are recommended in order to satisfy VEE requirements:**

FINANC 3000	Corporate Finance	3
FINANC 4020	Investments	3
MATH 4590	Investment Science II	3

10

**Total Credits** 52

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
ECONOM 1014	3	ECONOM 1015	3
ENGLISH 1000	3	CMP_SC 1040 or 1050	3
General Elective	3	General Elective	3
		General Elective	3
	14		17
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	MATH 4140	3
SPAN 1100	5	SPAN 1200	5
General Elective	3	STAT 4710	3
	16		14
Third Year			
Fall	Credits	Spring	Credits
MATH 3000	3	MATH 4700	3
MATH 4355	3	MATH 4371	3
STAT 4750	3	STAT 4760	3
SPAN 2100	3	General Elective	3
General Elective	3	General Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
MATH 4370	3	MATH 4590	3
STAT 4510	3	Elective	3
STAT 4870	3	Elective	3

Elective	3	Elective	3
Elective	3	Elective	3
	15		15
Total Credits: 121			

## Minor in Mathematics

To minor in mathematics, a student must satisfactorily complete the following requirements.

- The equivalents of MATH 1500, MATH 1700 and MATH 2300
- 9 additional credits in approved math courses (students not taking MATH 2320 or MATH 3000, must take all 9 credits at the 4000 level; students taking MATH 2320 or MATH 3000, need an additional 6 credits at the 4000 level)
- All courses completed with grades in C range or higher
- At least 9 credits used to satisfy the minor requirements taken in residence (College of Arts and Science requirement)

## Graduate

### MA in Mathematics

**Admission Contact Information**

Dan Edidin, director of graduate studies  
 202 Mathematical Sciences Building  
 Columbia, MO 65211  
 573-882-6221  
 mailto: muasmathdgs@missouri.edu

### Admission Criteria

**Notes:** Applicants for any graduate degree in mathematics should submit an application for graduate study. Admission to the graduate program does NOT guarantee admission to the Ph.D. program. International Applicants applying from outside North America who seek financial support from the Department will only be considered for the PhD program.

Fall deadline: January 15

- While a bachelor's degree from an accredited institution is required, the undergraduate major need not be mathematics as long as applicants have had sufficient mathematics training to qualify for 8000-level courses during the first three semesters of graduate work.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

**Important Notes:** International applicants seeking departmental support are required to have a minimum TOEFL score of 85 (Internet-based test) or equivalent. An ibtTOEFL Speaking subscore of 22 or higher is preferred.

- Minimum total academic IELTS score is 5.5

### Required Application Materials

- 3 or more letters of recommendation from your professors or persons who assess in detail your academic performance and potential.
- Transcripts

- Personal Statement
- GRE scores (required for PhD application, strongly recommended for Masters application)
- TOEFL or IELTS (International students only)

Note: The application is submitted through the Graduate School's ApplyYourself system. This includes the online credit card payment \$55.00 US for U.S. Citizens and Permanent Residents, \$75.00 US for Non-Resident International applicants.

## Completing the ApplyYourself Application:

This section consists of four subsections.

- Personal Information: Complete all information as requested.
- Application Information: Applications are considered only starting Fall Semester, and only for Full-time study. Select a degree from the Graduate Degrees offered by the MU Mathematics Department.
- Indicate your selection for the **Mathematics Master of Arts (MA)**
  - Admissions Category: Graduate Degree Sought at MU: Master's
  - Graduate Program to which you are seeking admissions: Mathematics Master of Arts (MA)
- Educational History: Complete all information as requested.
- Test Information:
  - The GRE General Test is required for application to the PhD program in Mathematics, and are strongly recommended for Masters applicants. GRE General Test scores sent directly from the ETS will be considered as part of an application if available. The GRE Subject Test is not required, will be considered if submitted.
  - MU's Institutional Code for the GRE is: 6875.
  - MU's Institutional Code for the TOEFL is: 6875.

## Supplemental Information:

- (required) Upload your Personal Statement, Statement of Goals or Statement of Purpose.
- Please indicate the specific degree for which you are applying, any additional degrees for which you may later apply, and explain your reasons for choosing to pursue these degrees at the University of Missouri. Note that admissions criteria for the PhD are more stringent than for the Master's. MU PhD students can later add a Master's degree to their program of study without requiring departmental approval. MU Master's students who wish to later add the PhD to their program of study require departmental evaluation and approval.
- (optional) Upload your resume or curriculum vita.
- (optional) Upload your writing sample.
- You may submit samples of your mathematical writings, publications, or pre-prints. Please limit to 10 pages.
- (optional) Upload any other supporting documents
- Unofficial copies of transcripts uploaded by applicant can be used for initial evaluation- official transcripts sent directly to the Graduate Admissions Office will still be required to finalize admission
- Unofficial copies of GRE reports uploaded by applicant can be used for initial evaluation

**RECOMMENDATIONS:** The ApplyYourself system will let you request confidential online recommendation letters from your recommendation providers. You need to provide the names and email addresses of recommendation providers who have agreed in advance to write letters for you. The Mathematics Department application requires at least three recommendation letters from your professors (or persons who assess in detail your academic performance and potential).

## International Applicants Only

- Unofficial copies of TOEFL/IELTS reports uploaded by applicant can be used for initial evaluation - official reports sent directly to the Graduate Admissions Office will still be required to finalize admission
- Affidavit of Support for International Applicants: It is not necessary to complete this form. International applicants are required to complete the Affidavit of Support OR provide a letter of support from a University of Missouri graduate degree program before immigration documents can be issued. All international admissions to the Mathematics graduate program come with financial support which suffices to meet this requirement.

*The following (paper) application materials must be on file at the Graduate Admissions office before an admission offer can be finalized:*

- Official transcripts/mark sheets from each college or university you have attended (sent directly from the college or university). Applicants with degrees from outside the United States must provide academic credentials in both the native language and in English.
- Official TOEFL or IELTS scores (sent directly from the testing service). Please review the Graduate School's policy regarding proof of English Language proficiency.

Please arrange to have these materials mailed to the following address:

University of Missouri-Columbia  
Graduate Admissions  
210 Jesse Hall  
Columbia, MO 65211  
800-877-6312  
573-884-8488

## MA Degree Completion Requirements

The degree requirements include the satisfactory completion of 30 hours of approved course work, of which at least 18 hours must be at the 8000 level. MATH 8250, MATH 8420, MATH 8425, and MATH 8410 are required, as is either MATH 8190 or MATH 8090. Students are expected to make up any required deficiencies in their undergraduate training in advanced calculus and abstract algebra. Students may list no more than two of the courses MATH 7110, MATH 7700, MATH 7900, MATH 7140, MATH 7720 and MATH 7920 on their graduate program. Furthermore, neither MATH 7100 nor MATH 7510 may be listed. The successful completion of a Master's Project (MATH 8190) or Master's Thesis (MATH 8090) must be certified by a Master's Committee consisting of three members of the Mathematics regular faculty.

## MS in Applied Mathematics

Admission Contact Information  
Dan Edidin, director of graduate studies  
202 Mathematical Sciences Building  
Columbia, MO 65211  
573-882-6221

mailto: muasmathdgs@missouri.edu

## Admission Criteria

**Notes:** Applicants for any graduate degree in mathematics should submit an application for graduate study. Admission to the graduate program does NOT guarantee admission to the Ph.D. program. International Applicants applying from outside North America who seek financial support from the Department will only be considered for the PhD program.

Fall deadline: January 15

- While a bachelor's degree from an accredited institution is required, the undergraduate major need not be mathematics as long as applicants have had sufficient mathematics training to qualify for 8000-level courses during the first three semesters of graduate work.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

**Important Notes:** International applicants seeking departmental support are required to have a minimum TOEFL score of 85 (Internet-based test) or equivalent. An ibtTOEFL Speaking subscore of 22 or higher is preferred.

- Minimum total academic IELTS score is 5.5

## Required Application Materials

- 3 or more letters of recommendation from your professors or persons who assess in detail your academic performance and potential.
- Transcripts
- Personal Statement
- GRE scores (required for PhD application, strongly recommended for Masters application)
- TOEFL or IELTS (International students only)

Note: The application is submitted through the Graduate School's ApplyYourself system. This includes the online credit card payment \$55.00 US for U.S. Citizens and Permanent Residents, \$75.00 US for Non-Resident International applicants.

## Completing the ApplyYourself Application:

This section consists of four subsections.

- Personal Information: Complete all information as requested.
- Application Information: Applications are considered only starting Fall Semester, and only for Full-time study. Select a degree from the Graduate Degrees offered by the MU Mathematics Department.
- Indicate your selection for the **Applied master of Mathematics Master of Arts (MS)**
  - Admissions Category: Graduate Degree Sought at MU: Master's
  - Graduate Program to which you are seeking admissions: Applied Mathematics Master of Science (MS)

- Educational History: Complete all information as requested.
- Test Information:
  - The GRE General Test is required for application to the PhD program in Mathematics, and are strongly recommended for Masters applicants. GRE General Test scores sent directly from the ETS will be considered as part of an application if available. The GRE Subject Test is not required, will be considered if submitted.
  - MU's Institutional Code for the GRE is: 6875.
  - MU's Institutional Code for the TOEFL is: 6875.

## Supplemental Information:

- (required) Upload your Personal Statement, Statement of Goals or Statement of Purpose.
- Please indicate the specific degree for which you are applying, any additional degrees for which you may later apply, and explain your reasons for choosing to pursue these degrees at the University of Missouri. Note that admissions criteria for the PhD are more stringent than for the Master's. MU PhD students can later add a Master's degree to their program of study without requiring departmental approval. MU Master's students who wish to later add the PhD to their program of study require departmental evaluation and approval.
- (optional) Upload your resume or curriculum vita.
- (optional) Upload your writing sample.
- You may submit samples of your mathematical writings, publications, or pre-prints. Please limit to 10 pages.
- (optional) Upload any other supporting documents
- Unofficial copies of transcripts uploaded by applicant can be used for initial evaluation- official transcripts sent directly to the Graduate Admissions Office will still be required to finalize admission
- Unofficial copies of GRE reports uploaded by applicant can be used for initial evaluation

**RECOMMENDATIONS:** The ApplyYourself system will let you request confidential online recommendation letters from your recommendation providers. You need to provide the names and email addresses of recommendation providers who have agreed in advance to write letters for you. The Mathematics Department application requires at least three recommendation letters from your professors (or persons who assess in detail your academic performance and potential).

## MS Degree Completion Requirements

Designed to give students training in those areas of mathematics used frequently in applications. A candidate must satisfactorily complete 30 hours of approved course work, at least 15 hours of which must be in 8000-level courses. MATH 8420, MATH 8445, MATH 8425 and MATH 8440 are required, as is either MATH 8190 or MATH 8090. At least three hours of the 30 hours must be taken outside the department. Additional requirements (some of which may be satisfied by work done as an undergraduate) include the completion of one year of advanced calculus and at least one approved course in each of the areas of linear algebra, numerical analysis and mathematical statistics or probability. Students may list no more than two of the courses MATH 7110, MATH 7700, MATH 7900, MATH 7140, MATH 7720 and MATH 7920 on their graduate program. Furthermore, neither MATH 7100 nor MATH 7510 may be listed. The successful completion of a Master's Project (MATH 8190) or

Master's Thesis (MATH 8090) must be certified by a Master's Committee consisting of three members of the Mathematics regular faculty.

## MST in Mathematics

### Admission Contact Information

Dan Edidin, director of graduate studies  
 202 Mathematical Sciences Building  
 Columbia, MO 65211  
 573-882-6221  
 email: muasmathdgs@missouri.edu

## Admission Criteria

**Notes:** Applicants for any graduate degree in mathematics should submit an application for graduate study. Admission to the graduate program does NOT guarantee admission to the Ph.D. program. International Applicants applying from outside North America who seek financial support from the Department will only be considered for the PhD program.

Fall deadline: January 15

- While a bachelor's degree from an accredited institution is required, the undergraduate major need not be mathematics as long as applicants have had sufficient mathematics training to qualify for 8000-level courses during the first three semesters of graduate work.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

**Important Notes:** International applicants seeking departmental support are required to have a minimum TOEFL score of 85 (Internet-based test) or equivalent. An ibtTOEFL Speaking subscore of 22 or higher is preferred.

- Minimum total academic IELTS score is 5.5

## Required Application Materials

- 3 or more letters of recommendation from your professors or persons who assess in detail your academic performance and potential.
- Transcripts
- Personal Statement
- GRE scores (required for PhD application, strongly recommended for Masters application)
- TOEFL or IELTS (International students only)
- Note: The application is submitted through the Graduate School's ApplyYourself system. This includes the online credit card payment \$55.00 US for U.S. Citizens and Permanent Residents, \$75.00 US for Non-Resident International applicants.

## Completing the ApplyYourself Application:

The application consists of four subsections.

- Personal Information: Complete all information as requested.
- Application Information: Applications are considered only starting Fall Semester, and only for Full-time study. Select a degree from the Graduate Degrees offered by the MU Mathematics Department.
- Indicate your selection for the Mathematics Master of Science for Teachers (MST)
- Admissions Category: Graduate Degree Sought at MU: Master's

- Graduate Program to which you are seeking admissions: Mathematics Master of Science for Teachers (MST)
- Educational History: Complete all information as requested.
- Test Information:
  - The GRE General Test is required for application to the PhD program in Mathematics, and are strongly recommended for Masters applicants. GRE General Test scores sent directly from the ETS will be considered as part of an application if available. The GRE Subject Test is not required, will be considered if submitted.
  - MU's Institutional Code for the GRE is: 6875.
  - MU's Institutional Code for the TOEFL is: 6875.

## Supplemental Information:

- (required) Upload your Personal Statement, Statement of Goals or Statement of Purpose.
- Please indicate the specific degree for which you are applying, any additional degrees for which you may later apply, and explain your reasons for choosing to pursue these degrees at the University of Missouri. Note that admissions criteria for the PhD are more stringent than for the Master's. MU PhD students can later add a Master's degree to their program of study without requiring departmental approval. MU Master's students who wish to later add the PhD to their program of study require departmental evaluation and approval.
- (optional) Upload your resume or curriculum vita.
- (optional) Upload your writing sample.
- You may submit samples of your mathematical writings, publications, or pre-prints. Please limit to 10 pages.
- (optional) Upload any other supporting documents
- Unofficial copies of transcripts uploaded by applicant can be used for initial evaluation- official transcripts sent directly to the Graduate Admissions Office will still be required to finalize admission
- Unofficial copies of GRE reports uploaded by applicant can be used for initial evaluation

**RECOMMENDATIONS:** The ApplyYourself system will let you request confidential online recommendation letters from your recommendation providers. You need to provide the names and email addresses of recommendation providers who have agreed in advance to write letters for you. The Mathematics Department application requires at least three recommendation letters from your professors (or persons who assess in detail your academic performance and potential).

## MST Degree Completion Requirements

This degree is designed primarily for those who want to teach mathematics at the secondary school level. A candidate for the degree must have a valid teaching certificate before entering the program and must satisfactorily complete 30 hours of approved course work. MATH 8190 or MATH 8090 is required. At least 15 hours must be in 8000-level courses, of which at least 9 hours must be courses from the Mathematics Department. At least two courses are required in the fields of algebra, analysis and geometry/topology. The successful completion of a Master's Project (MATH 8190) or Master's Thesis (MATH 8090) must be certified by a Master's Committee consisting of three members of the Mathematics regular faculty.

**Note:** The MU College of Education at the University of Missouri is a separate academic unit offering graduate degrees in Mathematics Education, with an emphasis on learning, teaching, and curriculum development.

## PhD in Mathematics

Admission Contact Information  
 Dan Edidin, Director of Graduate Studies  
 202 Mathematical Sciences Building  
 Columbia, MO 65211  
 573-882-6221  
 mailto: muasmathdgs@missouri.edu

### Admission Criteria

**Note:** Applicants for any graduate degree in mathematics should submit an application for graduate study. International Applicants applying from outside North America who seek financial support from the Department will only be considered for the PhD program.

Fall deadline: January 15

- While a bachelor's degree from an accredited institution is required, the undergraduate major need not be mathematics as long as applicants have had sufficient mathematics training to qualify for 8000-level courses during the first three semesters of graduate work.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

**Important Notes:** International applicants seeking departmental support are required to have a minimum TOEFL score of 85 (Internet-based test) or equivalent. An ibtTOEFL Speaking subscore of 22 or higher is preferred.

- Minimum IELTS score:

Item	Score
OVERALL	5.5

### Required Application Materials

- 3 or more letters of recommendation from your professors or persons who assess in detail your academic performance and potential.
- Transcripts
- Personal Statement
- GRE scores (required for PhD application, strongly recommended for Masters application)
- TOEFL or IELTS (International students only)

Note: The application is submitted through the Graduate School's ApplyYourself (<http://gradschool.missouri.edu/admissions>) system. This includes the online credit card payment \$55.00 US for U.S. Citizens and Permanent Residents, \$75.00 US for Non-Resident International applicants.

### Completing the ApplyYourself Application:

The application consists of four subsections.

- Personal Information: Complete all information as requested.
- Application Information: Applications are considered only starting Fall Semester, and only for Full-time study. Select a degree from the Graduate Degrees offered by the MU Mathematics Department.
- Indicate your selection for the Mathematics Doctor of Philosophy (PhD)
- Admissions Category: Graduate Degree Sought at MU: Doctorate

- Graduate Program to which you are seeking admissions: Mathematics Doctor of Philosophy (PhD)
- Educational History: Complete all information as requested.
- Test Information:
  - The GRE General Test is required for application to the PhD program in Mathematics, and are strongly recommended for Masters applicants. GRE General Test scores sent directly from the ETS will be considered as part of an application if available. The GRE Subject Test is not required, will be considered if submitted.
  - MU's Institutional Code for the GRE is: 6875.
  - MU's Institutional Code for the TOEFL is: 6875.

### Supplemental Information:

- (required) Upload your Personal Statement, Statement of Goals or Statement of Purpose.
- Please indicate the specific degree for which you are applying, any additional degrees for which you may later apply, and explain your reasons for choosing to pursue these degrees at the University of Missouri. Note that admissions criteria for the PhD are more stringent than for the Master's. MU PhD students can later add a Master's degree to their program of study without requiring departmental approval. MU Master's students who wish to later add the PhD to their program of study require departmental evaluation and approval.
- (optional) Upload your resume or curriculum vita.
- (optional) Upload your writing sample.
- You may submit samples of your mathematical writings, publications, or pre-prints. Please limit to 10 pages.
- (optional) Upload any other supporting documents
- Unofficial copies of transcripts uploaded by applicant can be used for initial evaluation- official transcripts sent directly to the Graduate Admissions Office will still be required to finalize admission
- Unofficial copies of GRE reports uploaded by applicant can be used for initial evaluation

**RECOMMENDATIONS:** The ApplyYourself system will let you request confidential online recommendation letters from your recommendation providers. You need to provide the names and email addresses of recommendation providers who have agreed in advance to write letters for you. The Mathematics Department application requires at least three recommendation letters from your professors (or persons who assess in detail your academic performance and potential).

### International Applicants Only

- Unofficial copies of TOEFL/IELTS reports uploaded by applicant can be used for initial evaluation - official reports sent directly to the Graduate Admissions Office will still be required to finalize admission
- Affidavit of Support for International Applicants: It is not necessary to complete this form. International applicants are required to complete the Affidavit of Support OR provide a letter of support from a University of Missouri graduate degree program before immigration documents can be issued. All international admissions to the Mathematics graduate program come with financial support which suffices to meet this requirement.

*The following (paper) application materials must be on file at the Graduate Admissions office before an admission offer can be finalized:*

- Official transcripts/mark sheets from each college or university you have attended (sent directly from the college or university). Applicants with degrees from outside the United States must provide academic credentials in both the native language and in English.
- Official TOEFL or IELTS scores (sent directly from the testing service). Please review the Graduate School's policy regarding proof of English Language proficiency.

Please arrange to have these materials mailed to the following address:

University of Missouri-Columbia  
Graduate Admissions  
210 Jesse Hall  
Columbia, MO 65211  
800-877-6312  
573-884-8488

## PhD Degree Completion Requirements

This is a professional research degree designed to prepare students for various advanced professional careers, including college teaching and research. Before formally becoming a candidate, a student must have training equivalent to that required for a master's degree. Specifically, the student must demonstrate expertise (as determined by the department) in one of the following sequences of 8000 level classes, MATH 8250, MATH 8420, MATH 8425, MATH 8410 or MATH 8420, MATH 8445, MATH 8425, MATH 8440 . In addition students must pass a qualifying examination shortly after beginning work at MU. The candidate must further complete a course of study approved by the doctoral program committee and pass a comprehensive examination. The active areas of research interest of the current members of the staff are: algebraic geometry, analysis (real, complex, functional and harmonic), analytic functions, applied mathematics, financial mathematics and mathematics of insurance, commutative rings, scattering theory, differential equations (ordinary and partial), differential geometry, dynamical systems, general relativity, mathematical physics, number theory, probabilistic analysis and topology.

Note: Effective at the start of Winter Semester 2007, there is NO foreign language proficiency requirement for the Mathematics PhD. However, a student's Doctoral Committee still retains the discretion to impose a foreign language proficiency requirement.

## Music

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Robert Shay, Director  
140 Fine Arts Bldg.  
(573) 882-2606

The School of Music is a department in the College of Arts and Sciences that offers instruction to those who want professional training in music as well as those who wish to pursue music as a vocation. Applied music instruction in piano, voice, string, woodwind, brass and percussion instruments is offered for beginning and advanced students. Elementary and advanced courses are given in music theory and composition. The appreciation, literature and history of music are covered by survey and specialized courses. The school has been an accredited member of the National Association of Schools of Music since 1933.

The School of Music also offers opportunities for all students of the university to participate in various performing groups. Regular programs are presented on campus and throughout the state by groups such as The University Philharmonic Orchestra, University Wind Ensemble, Marching Mizzou, Symphonic Band, University Band, Jazz Ensembles, Choral Union, University Singers, Chamber Singers, Concert Chorale, Hitt Street Harmony, Women's Choir, Opera Workshop and many vocal, string, percussion and wind chamber ensembles. Membership in these groups is open to interested students by audition, except University Choral Union and University Band, which do not require an audition.

The department offers BA, BM, MA and MM degrees majors in Music. BSEd, MA, MEd, EdSP and PhD degrees with majors in Music Education are offered through the Department of Learning, Teaching and Curriculum. A minor in Music and a minor and certificate in Jazz Studies are also available.

## Faculty

**Professor** M. Budds\*, P. Crabb\*, W. T. McKenney\*, L. Perna\*, M. Platt\*, R. Shay\*, W. Sims\*, M. Spence\*, E. Szekely\*, J. E. Todd\*, J. Wenger\*

**Associate Professor** I. Akhmadullin\*, E. Dolbashian\*, D. Dolezal\*, S. Freund\*, J. Gaines\*, P. Garritson\*, A. Harrell\*, A. Manzo\*, N. Minturn\*, P. Miyamoto\*, T. O'Neal\*, L. Saguiguit\*, D. Willett\*

**Associate Teaching Professor** C. Seitz\*

**Assistant Professor** M. Gibson\*, T. Howe\*, S. Jensen\*, J. Mabary\*, M. Major\*, P. Savvidou\*, S. Shonekan\*, B. Silvey\*, A. White\*

**Assistant Teaching Professor** C. Baumgartner\*, J. Kuuskoski\*, W. Lackey\*, B. Snow\*

**Visiting Assistant Professor** A. K. Dade\*, R. Pellegrin\*, M. Stone\*

**Adjunct Instructor** T. Andes, A. Beeson, N. Bolshakova, M. Carlson, K. Gianino, K. Hennessy, S. Hennessy, A. Glise\*, E. Manzo, S. Ryan, P. Seitz\*, S. Stubbs, B. Tate, D. Urton

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 233)

- BA in Music (p. 233)
- BM in Music (p. 234)
  - with emphasis in Composition (p. 234)
  - with emphasis in History (p. 236)
  - with emphasis in Music (p. 237)
  - with emphasis in Music Theory (p. 237)
  - with emphasis in Performance (p. 238)
- Minor in Music (p. 242)

## Graduate

School of Music  
140 Fine Arts Center  
573-882-2604  
<http://music.missouri.edu/>

**Director of Graduate Studies:** Dan Willett

- MA in Music (p. 242) (in Music History)
- MM in Music (p. 244) (in performance)

## About the School of Music

Founded in 1907, the School of Music is one of the larger academic units in the College of Arts and Science. Comprised of 38 full-time faculty members and approximately 300 music majors, it is small enough to permit close, personal interaction between students and faculty, but large enough to provide many wonderful opportunities for talented students to excel. Our primary mission is to prepare students to become professional musicians and music educators. The School of Music is widely known for its scholarship in the field, and it is an important cultural resource for the profession, the campus community, and the people of Missouri.

## Performance

At MU a student of music has the opportunity to hear many concerts or to participate in a variety of performing organizations. Many recitals are given by students, faculty and visiting artists. Among the student ensembles that give several concerts during the year are the University Philharmonic, University Wind Ensemble and other concert bands, jazz ensembles, University Singers and other choral ensembles, Show-Me Opera, and chamber music groups. Faculty ensembles that present recitals regularly include the Esterhazy String Quartet, the Missouri Woodwind Quintet and the MU Faculty Brass Quintet.

## Resources and Facilities

The music section of the Fine Arts Building contains a recital hall, classrooms, studios and practice facilities. The music holdings in Ellis Library, both printed and recorded materials, constitute a substantial research and reference collection. The School of Music maintains a digital piano and MIDI laboratory, analog and digital music studios, and access to a listening laboratory for history and theory courses.

## Additional Degree Options

### Graduate Certificate in Jazz Studies (p. 310)

### Music Education Degrees

These are degrees offered by the Department of Learning, Teaching, and Curriculum in the College of Education (p. 366) in conjunction with the School of Music. These degrees include



- Master of Arts (MA)
- Master of Education (M Ed)
- Educational Specialist (EdSp)
- Doctor of Philosophy (PhD) (focus on music education)

## Undergraduate

### Department Level Requirements - Music

#### Departmental Honors

Departmental Honors for the School of Music are designed to reward truly superlative achievement by an undergraduate music student, focusing on the student's area of performance, theory and composition, or history and literature. A minimum GPA of 3.3 at the onset of the senior year is required, not including grades for large ensembles. The student must initiate the process by submitting a formal application to the Director of the School of Music at the beginning of the semester prior to the semester of graduation, and must receive approval from his or her area coordinator and faculty advisor. Further information and an application form may be obtained by contacting the Director of Undergraduate Studies in Music.

### BA in Music

#### Major Program Requirements

Students who elect to earn a Bachelor of Arts with a major in Music will complete a general, liberal arts degree with a strong music emphasis. Students must also complete all degree, college and university graduation requirements, including Arts & Science Foundation Requirements.

Courses completed in the D range may not fulfill music course requirements without the approval of the advisor and the dean, and the student must achieve an overall average of at least C (2.0) in all of the courses attempted in the School of Music.

#### Major Core Requirements

MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_H_LI 1322	Introduction to Music in the United States	2

MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUSIC 4300 level	History Elective (Wring Intensive)	3
MUS_GENL 3085	Problems in Music (Capstone Experience)	1
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors (7 semesters)	0
MUS_APMS 2455	Studio Instruction (2+2+2+2)	8
MUS_APMS 3455	Studio Instruction	2
MUS_ENS 1841 or MUS_ENS 1842	Instrumental Ensemble or Choral Ensemble	4
<b>Total Credits</b>		<b>40</b>

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091 (Section 3)	0	MUS_GENL 1091	0
MUS_THRY 1220	2	MUS_THRY 1221	2
MUS_THRY 1230	2	MUS_THRY 1231	2
MUS_ENS 1841 or 1842	1	MUS_H_LI 1322	2
MUS_APMS 2455	2	MUS_ENS 1841 or 1842	1
Non-Music Courses	8	MUS_APMS 2455	2
		Non-Music Courses	6
	<b>15</b>		<b>15</b>
Second Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	2	MUS_APMS 2455	2
Non-Music Courses	6	Non-Music Courses	6
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_APMS 3455	2	Non-Music Courses	15
Music History Elective	3		
Non-Music Course	10		
	<b>15</b>		<b>15</b>

Fourth Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 3085	1
Non-Music Courses	15	Non-Music Courses	14
	15		15
Total Credits: 120			

## BM in Music

### Major Program Requirements

The Bachelor of Music (BM) is a professional degree that offers the maximum concentration in music. The student may focus on instrumental, keyboard or vocal performance; music theory; composition; or music history by choosing an emphasis area. In addition, students must complete degree, college and university requirements, including Arts & Science Foundation Requirements.

#### Foreign Language Requirement:

- Woodwind or Percussion Performance: 12-13 hours of any foreign language
- Theory, Composition, or Piano or Brass Performance: 12-13 hours of French, Italian, or German
- Music History: 10 hours of German + 5-6 hours of second language, approved by adviser (15-16 total)
- String Performance: 12-13 hours of French, Italian, German or Spanish
- Vocal Performance: GERMAN 1100 Elementary German I (5 hours), FRENCH 1100 Elementary French I (5 hours), and ITAL 1100 Elementary Italian I (6 hours); and one additional course in German (5 hours), French (5 hours), or Italian (6 hours) (21-22 hours total). In addition, one hour each in Italian, French, and German diction (music courses; 3 hours total)

Candidates must pass an examination administered by the applied faculty in the area of performance at the completion of their sophomore year before entrance is approved to studio instruction at the 4455-level (for performance tracks) or 3455-level (for all other tracks). All BM candidates are required to fulfill the school's recital attendance requirement. In addition, each performance major is required to present a junior and senior recital, which must be approved two weeks in advance by a faculty hearing committee.

Courses completed in the "D" range may not fulfill music course requirements without the approval of the adviser and the dean, and the student must achieve an overall average of at least C (2.0) in all of the courses attempted in the School of Music at MU.

**Note: Performance tracks requirements include changes in effect for students entering Fall 2012 and later. Students who entered before Fall 2012 should consult an older undergraduate catalog.**

#### Requirements for ALL emphasis areas and tracks

MUS_THRY 1210	Introduction to Computer Technology and Music	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2

MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 42xx	Theory Elective	2
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective	3
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors (7 semesters)	0
Total Credits		36

### Semester Plans

Refer to the sample plans of study that have been designed for the emphasis areas.

## BM in Music with Emphasis in Composition

### Major Program Requirements

In addition to the list of required courses below for the emphasis in Composition, students must complete the bachelor of music (p. 234), college and university requirements (p. 17), including Arts & Science Foundation Requirements (p. 126).

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_APMS 1435	Studio Instruction for Majors	4
MUS_APMS 2455	Studio Instruction	8
MUS_APMS 3455	Studio Instruction	8
MUS_ENS 1841 or MUS_ENS 1842	Instrumental Ensemble or Choral Ensemble	8
MUS_THRY 1210	Introduction to Computer Technology and Music	2

MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2215	Composition I	2
MUS_THRY 2216	Composition II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 3215	Composition III	2
MUS_THRY 3216	Composition IV	2
MUS_THRY 4215	Composition V	2
MUS_THRY 4216	Composition VI	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 4225	Sixteenth-Century Counterpoint	3
MUS_THRY 4227	Orchestration	2
MUS_THRY 4245	Introduction to Electronic Music	2
MUS_THRY 42xx	Theory Elective 2+2+2	6
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective 3+3	6
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
MUS_I_VT 2631	Basic Conducting and Score Reading	2
<b>Total Credits</b>		<b>94</b>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 2455	2	MUS_APMS 2455	2
Non-Music Courses	6-8	Non-Music Courses	6-8
	<b>16-18</b>		<b>16-18</b>
Second Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_APMS 1435	1	MUS_APMS 1435	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_THRY 2215	2	MUS_THRY 2216	2
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	2	MUS_APMS 2455	2
MUS_I_VT 2610	1	MUS_I_VT 2611	1
Non-Music Courses	3-5	Non-Music Courses	3-5
	<b>16-18</b>		<b>16-18</b>
Third Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_APMS 1435	1	MUS_APMS 1435	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_THRY 3215	2	MUS_I_VT 2631	2
MUS_APMS 3455	2	MUS_THRY 3216	2
MUS_THRY 4220	2	MUS_APMS 3455	2
MUS_THRY 4227	2	MUS_THRY 42xx (Theory Elective)	2
MUS_THRY 4223	3	Non-Music Courses	4-6
MUS_THRY 4245	2		
Non-Music Courses	3		
	<b>18</b>		<b>14-16</b>
Fourth Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_ENS 1841 or 1842	1
MUS_ENS 1841 or 1842	1	MUS_APMS 3455	2
MUS_APMS 3455	2	MUS_THRY 4216	2
MUS_THRY 4215	2	Music History Elective Course	3
MUS_THRY 4225	3	Music Theory Elective Course	2
Music History Elective Course	3	Non-Music Courses	4-7

Music Theory Elective Course	2		
Non-Music Courses	3-5		
	<b>16-18</b>		<b>14-17</b>
Total Credits: 126-141			

## BM in Music with Emphasis in History

### Major Program Requirements

In addition to the list of required courses below for the emphasis in History, students must complete the bachelor of music (p. 234), college and university requirements (p. 17), including Arts & Science Foundation Requirements (p. 126).

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_APMS 1435	Studio Instruction for Majors (Piano 1+1+1+1)	4
or MUS_APMS 2455	Studio Instruction	
MUS_APMS 2455	Studio Instruction (2+2+2+2)	8
MUS_APMS 3455	Studio Instruction (2+2)	4
MUS_ENS 1841	Instrumental Ensemble (1+1+1+1+1+1+1+1)	8
or MUS_ENS 1842	Choral Ensemble	
MUS_THRY 1210	Introduction to Computer Technology and Music	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4225	Sixteenth-Century Counterpoint	3
or MUS_THRY 4223	Eighteenth-Century Counterpoint	
MUS_THRY 4227	Orchestration	2
MUS_H_LI 1322	Introduction to Music in the United States	2

MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_H_LI 43xx	History Elective 3+3+6+6	18
MUS_GENL 3085	Problems in Music	1
<b>Total Credits</b>		<b>80</b>

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091 (Section 3)	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 2455	2	MUS_APMS 2455	2
Non-Music Courses	6-8	Non-Music Courses	6-8
	<b>16-18</b>		<b>16-18</b>
Second Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	2	MUS_APMS 2455	2
MUS_I_VT 2610	1	MUS_I_VT 2611	1
Non-Music Courses	6-8	Non-Music Courses	6-8
	<b>16-18</b>		<b>16-18</b>
Third Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_APMS 1435 or 2455 (piano)	1	MUS_APMS 1435 or 2455 (piano)	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 3455	2	MUS_I_VT 2631	2
MUS_THRY 4220	2	MUS_APMS 3455	2
MUS_THRY 4223 or 4225	3	MUS_THRY 4227	2
Music History Course	3	Music History Course	3
Non-Music Courses	4-6	Non-Music Courses	5-7
	<b>16-18</b>		<b>16-18</b>

Fourth Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_APMS 1435 or 2455 (piano)	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 1435 or 2455 (piano)	1	MUS_GENL 3085 (Capstone)	1
Music History Courses	6	Music History Courses	6
Non-Music Courses	8-10	Non-Music Courses	7-9
	<b>16-18</b>		<b>16-18</b>
Total Credits: 128-144			

## BM in Music Emphasis in Music

### Major Program Requirements

Students should contact the academic department for details on the specific degree requirements for this emphasis.

### Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BM in Music Emphasis in Music Theory

### Major Program Requirements

In addition to the list of required courses below for the emphasis in Music Theory, students must complete the bachelor of music (p. 234), college and university requirements (p. 17), including Arts & Science Foundation Requirements (p. 126).

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors (7 satisfactory semesters)	0
MUS_APMS 1435	Studio Instruction for Majors (secondary instr. 1+1+1+1)	4
MUS_APMS 2455	Studio Instruction (Major instr. 2+2+2+2)	8
MUS_APMS 3455	Studio Instruction (2+2+2+2)	8
MUS_ENS 1841 or MUS_ENS 1842	Instrumental Ensemble (1+1+1+1+1+1+1+1) or Choral Ensemble	8
MUS_THRY 1210	Introduction to Computer Technology and Music	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2215	Composition I	2

MUS_THRY 2216	Composition II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 4225	Sixteenth-Century Counterpoint	3
MUS_THRY 4227	Orchestration	2
MUS_THRY 42xx	Theory Elective 2+2+2 or 3	6-7
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective 3+3	6
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_GENL 3085	Problems in Music (Capstone Theory)	2
<b>Total Credits</b>		<b>86-87</b>

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091 (Section 3)	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 2455	2	MUS_APMS 2455	2
Non-Music Courses	6-8	Non-Music Courses	6-8
	<b>16-18</b>		<b>16-18</b>
Second Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0

MUS_APMS 1435 (Secondary Instrument)	1	MUS_APMS 1435 (Secondary Instrument)	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_THRY 2215	2	MUS_THRY 2216	2
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	2	MUS_APMS 2455	2
MUS_I_VT 2610	1	MUS_I_VT 2611	1
Non-Music Courses	3-5	Non-Music Courses	3-5
	<b>16-18</b>		<b>16-18</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_APMS 1435 (Secondary Instrument)	1	MUS_APMS 1435 (Secondary Instrument)	1
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 3455	2	MUS_I_VT 2631	2
MUS_THRY 4220	2	MUS_APMS 3455	2
MUS_THRY 4223	3	Music Theory Elective Course	2
MUS_THRY 4227	2	Non-Music Courses	6-8
Non-Music Courses	5-7		
	<b>16-18</b>		<b>14-16</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_ENS 1841 or 1842	1
MUS_ENS 1841	1	MUS_GENL 3085 (Theory)	2
MUS_APMS 3455	2	MUS_APMS 3455	2
MUS_THRY 4225	3	Music History Elective Course	3
Music History Elective Course	3	Music Theory Elective Course	2-3
Music Theory Elective Course	2	Non-Music Courses	5-7
Non-Music Courses	5-7		
	<b>16-18</b>		<b>15-18</b>
Total Credits: 125-142			

## BM in Music Emphasis in Performance

### Major Program Requirements

In addition to the list of required courses below for the emphasis in Performance for each track (piano, string performance, vocal performance, wind or percussion performance), students must complete the bachelor of music (p. 234), college and university requirements (p. 17), including Arts & Science Foundation Requirements (p. 126).

#### Piano Track

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_APMS 2455	Studio Instruction (4+4+4+4)	16

MUS_APMS 4455	Studio Instruction (4+3+4+3)	14
MUS_APMS 3970	Junior Recital	1
MUS_APMS 4970	Senior Recital	1
MUS_ENS 1841 or MUS_ENS 1842	Instrumental Ensemble (1+1) Choral Ensemble	2
MUS_ENS 1846	Chamber Music (1+1+1+1)	4
MUS_THRY 1210	Introduction to Computer Technology and Music	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 42xx	Theory Elective	2
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective	3
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_I_VT 2661	Keyboard Skills for Piano Majors I	2
MUS_I_VT 2662	Keyboard Skills for Piano Majors II	2
MUS_I_VR 3753	Piano Literature I	2
MUS_I_VR 3754	Piano Literature II	2
MUS_I_VT 4661	Piano Pedagogy Survey I	2
MUS_I_VT 4662	Piano Pedagogy Survey II	2
Total Credits		86

#### String Performance Track

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors (7 satisfactory semesters)	0
MUS_APMS 2455	Studio Instruction (4+4+4+4)	16
MUS_APMS 4455	Studio Instruction (4+3+4+3)	14

MUS_APMS 3970	Junior Recital	1
MUS_APMS 4970	Senior Recital	1
MUS_ENS 1841	Instrumental Ensemble (University Philharmonic)	8
MUS_ENS 1846	Chamber Music (1+1)	2
MUS_THRY 1210	Introduction to Computer Technology and Music	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 42xx	Theory Elective	2
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective	3
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
MUS_I_VT 2631	Basic Conducting and Score Reading	2
Total Credits		82

**Vocal Performance Track**

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors (7 satisfactory semesters)	0
MUS_APMS 2455	Studio Instruction (3+3+3+3)	12
MUS_APMS 3970	Junior Recital	1
MUS_APMS 4455	Studio Instruction (3+2+3+2)	10
MUS_APMS 4970	Senior Recital	1
MUS_ENS 1842	Choral Ensemble (1+1+1+1+1+1+1)	8
MUS_ENS 1865	Opera Workshop (1+1)	2

MUS_THRY 1210	Introduction to Computer Technology and Music	2
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 42xx	Theory Elective	2
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective	3
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_I_VT 3670	Diction in Singing: Italian	1
MUS_I_VT 3671	Diction in Singing: German	1
MUS_I_VT 3672	Diction in Singing: French	1
MUS_I_VR 4767	Vocal Literature I	2
MUS_I_VR 4768	Vocal Literature II	2
Total Credits		81

**Wind or Percussion Performance Track**

MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_APMS 2455	Studio Instruction (4+4+4+4)	16
MUS_APMS 3970	Junior Recital	1
MUS_APMS 4455	Studio Instruction (4+3+4+3)	14
MUS_APMS 4970	Senior Recital	1
MUS_ENS 1841	Instrumental Ensemble (1+1+1+1+1+1+1)	8
MUS_ENS 1846	Chamber Music (1+1)	2
MUS_THRY 1210	Introduction to Computer Technology and Music	2

MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
MUS_THRY 4223	Eighteenth-Century Counterpoint	3
MUS_THRY 42xx	Theory Elective	2
MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2
MUS_H_LI 43xx	History Elective	3
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_I_VT 2634	Rehearsal Clinic: Band Conducting	2
Total Credits		84

## Semester Plan

Below is a sample plan of study, semester by semester, for each track. A student's actual plan may vary based on course choices where options are available.

### Piano Performance Track

First Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091 (Section 3)	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_ENS 1841 or 1842	1	MUS_ENS 1841 or 1842	1
MUS_APMS 2455	4	MUS_APMS 2455	4
Non-Music Courses	4-6	Non-Music Courses	4-6
		15-17	15-17
Second Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0

MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_I_VT 2661	2	MUS_H_LI 2308	2
MUS_I_VT 4661	2	MUS_APMS 2455	4
MUS_H_LI 2307	2	MUS_I_VT 2662	2
MUS_APMS 2455	4	MUS_I_VT 4662	2
Non-Music Courses	2-4	Non-Music Courses	2-4
		16-18	16-18
Third Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1846	1	MUS_ENS 1846	1
MUS_THRY 4220	2	MUS_I_VT 2631	2
MUS_APMS 4455	4	MUS_APMS 3970	1
Music History Elective	3	MUS_APMS 4455	3
Non-Music Courses	5-7	Music Theory Elective Course	2
		Non-Music Courses	3-5
		15-17	12-14
Fourth Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_ENS 1846	1
MUS_ENS 1846	1	MUS_I_VR 3754	2
MUS_I_VR 3753	2	MUS_APMS 4970	1
MUS_THRY 4223	3	MUS_APMS 4455	3
MUS_APMS 4455	4	Non-Music Courses	6-8
Non-Music Courses	5-7		
		15-17	13-15
Total Credits: 117-133			

### String Instrument Performance Track

First Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091 (Section 3)	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_APMS 2455	4	MUS_APMS 2455	4
undefined	3-6	Non-Music Courses	3-6
		15-18	15-18
Second Year			
Fall	Credits	Spring	Credits
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	4	MUS_APMS 2455	4



MUS_I_VT 2610	1	MUS_I_VT 2611	1
Non-Music Courses	3-6	Non-Music Courses	3-6
	<b>15-18</b>		<b>15-18</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_THRY 4220	2	MUS_I_VT 2631	2
MUS_APMS 4455	4	MUS_APMS 3970	1
Music History Elective	3	MUS_APMS 4455	3
Non-Music Courses	5-8	Music Theory Elective	2
		Non-Music Courses	3-5
	<b>15-18</b>		<b>12-14</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_ENS 1841	1
MUS_ENS 1841	1	MUS_APMS 4455	3
MUS_APMS 4455	4	MUS_ENS 1846	1
MUS_THRY 4223	3	MUS_APMS 4970	1
MUS_ENS 1846	1	Non-Music Courses	8-10
Non-Music Courses	7-9		
	<b>16-18</b>		<b>14-16</b>
Total Credits: 117-138			

## Vocal Performance Track

<b>First Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_ENS 1842	1	MUS_ENS 1842	1
MUS_APMS 2455	3	MUS_APMS 2455	3
Non-Music Courses	5-7	Non-Music Courses	5-7
	<b>16-18</b>		<b>16-18</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1842	1	MUS_ENS 1842	1
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	3	MUS_APMS 2455	3
MUS_I_VT 2610	1	MUS_I_VT 2611	1
MUS_I_VT 3670	1	MUS_I_VT 3671	1
MUS_I_VT 3672	1	Non-Music Courses	5-7
Non-Music Courses	5-7		
	<b>18-20</b>		<b>17-19</b>

<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1842	1	MUS_ENS 1842	1
MUS_I_VT 3670	1	MUS_I_VT 2631	2
MUS_THRY 4220	2	MUS_APMS 3970	1
MUS_APMS 4455	3	MUS_APMS 4455	2
Music History Elective	3	MUS_I_VR 4767	2
Non-Music Courses	6-8	Music Theory Elective	2
		Non-Music Courses	3-5
	<b>16-18</b>		<b>13-15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_ENS 1842	1
MUS_ENS 1842	1	MUS_I_VR 4768	2
MUS_THRY 4223	3	MUS_APMS 4455	2
MUS_APMS 4455	3	MUS_APMS 4970	1
MUS_ENS 1865	1	MUS_ENS 1865	1
Non-Music Courses	6-8	Non-Music Courses	7-9
	<b>14-16</b>		<b>14-16</b>
Total Credits: 124-140			

## Wind or Percussion Performance Track

<b>First Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_THRY 1210	2	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_APMS 2455	4	MUS_APMS 2455	4
Non-Music Courses	4-6	Non-Music Courses	4-6
	<b>16-18</b>		<b>16-18</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_APMS 2455	4	MUS_APMS 2455	4
MUS_I_VT 2610	1	MUS_I_VT 2611	1
Non-Music Courses	4-6	Non-Music Courses	4-6
	<b>16-18</b>		<b>16-18</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_GENL 1091	0
MUS_ENS 1841	1	MUS_ENS 1841	1

MUS_THRY 4220	2	MUS_I_VT 2631	2
MUS_APMS 4455	4	MUS_APMS 4455	3
Music History Elective Course	3	MUS_APMS 3970	1
Non-Music Courses	6-8	Music Theory Elective Course	2
		Non-Music Courses	3-5
	<b>16-18</b>		<b>12-14</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MUS_GENL 1091	0	MUS_ENS 1841	1
MUS_ENS 1841	1	MUS_I_VT 2634	1
MUS_APMS 4455	4	MUS_APMS 4455	3
MUS_THRY 4223	3	MUS_APMS 4970	1
MUS_ENS 1846	1	MUS_ENS 1846	1
Non-Music Courses	9-11	Non-Music Courses	6-8
	<b>18-20</b>		<b>13-15</b>
Total Credits: 123-139			

## Minor in Music

Students who have chosen a major in another field but who wish to continue their musical growth may wish to pursue a music minor. Approval for declaration of the Minor in Music must be received from the Associate Director in Music. A minimum of 18 credits is required:

### Music Theory

MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2

### Music History

MUS_H_LI 1322	Introduction to Music in the United States	2
MUS_H_LI 2307	History of Western Music I	2
MUS_H_LI 2308	History of Western Music II	2

### Ensembles/Applied Music

Any combination of MUSIC 1841, 1842, 2445	4
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### Additional Credits in either Theory, History, or Performance

Total Credits	18
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## Graduate

### MA in Music

#### About the MA

The MA in Music History provides opportunities for continued development of musical insights, scholarly competencies, and the enhancement of interests in musical and related non-musical areas. This liberal graduate education is designed to prepare a student to pursue a career in college teaching, especially as preparation for doctoral studies in music history or musicology.

#### Prerequisites

Entrance into the MA degree program requires completion of a bachelor's degree in music (or demonstrated equivalent), a **GPA of 3.0 in the**

**last 60 credit-hours**, and additional prerequisites listed below. In the event that a candidate does not meet the required prerequisites, appropriate additional course(s) will be added as requirements to the degree program.

- Keyboard competency as is typically developed in an undergraduate music degree program
- 4 semesters of languages: 2 semesters each of French, Italian, or German
- 3 courses beyond the core music history courses (Music 2307, 2308 at MU)
- Freshman/sophomore music theory courses
- 1 semester of orchestration
- 1 course in counterpoint (3 credits or equivalent)
- 1 course in Western civilization
- 1 course in European history prior to 1800

### Priority Application Deadline

All graduate applicants are expected to submit required application materials (for both the School of Music and the Graduate School) by January 15 for fall semester matriculation, in order to receive full consideration for admission and assistantship or scholarship support. Applications submitted after January 15 will be considered as space permits on a rolling basis. Applicants interested in spring semester matriculation should contact the Associate Director of the School of Music (see below).

### Application Process

1. Apply online via the Graduate School's ApplyYourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) system.
2. Register for an audition or interview.
3. Submit an essay explaining professional goals to the Admissions Coordinator in the School of Music (contact information below) or online to the Graduate School (supplemental application materials).
4. For all programs except Music Education, submit three letters of recommendation directly to the Admissions Coordinator in the School of Music (contact information below).

**Notes:** The School of Music does not require GRE scores. Please also note that there can be a delay of up to two weeks between the Graduate School's receipt of undergraduate transcripts and the School of Music's receipt of them from the Graduate School for required additional processing. If you are applying within two weeks of the priority application deadline of January 15 or would otherwise like to expedite your application, please request that copies of your undergraduate transcripts be sent directly to both the Graduate School and the Admissions Coordinator in the School of Music (contact information below)

### International Student Information

Strong English reading, writing, and speaking abilities are necessary for success in the graduate programs in the School of Music. The following scores are required for admission to a graduate degree program in the School of Music:

### Admission Criteria

Fall deadline: none set, but February 15 for guaranteed consideration for departmental financial aid

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

**Note:** No TOEFL subscores below 50 (paper) or 15 (internet), or IELTS 5

- Minimum Academic IELTS scores:

Item	Score
OVERALL	6.5

**Note:** No IELTS subscores below 5

**FOOTNOTE:** If you have a TOEFL score between 500 and 550 (paper) or between 61 and 79 (internet), or an IELTS score between 5.5 and 6.5, you may still be admitted to the School of Music but may be required to take courses from the English Language Support Program at the University of Missouri. These courses will increase the length of your program by one or two semesters, assuming you make good progress in English and eventually achieve the School of Music’s required TOEFL or IELTS scores. **Note:** the University of Missouri’s institutional code for the TOEFL is 6875.

## Audition Information

A visit to the School of Music and in-person audition are strongly encouraged for applicants planning to major in an applied area (brass, classical guitar, jazz, percussion, piano, strings, voice, woodwinds), either on one of the graduation audition days (see below) or at another arranged time. In-person auditions are required for all conducting applicants. If you are an international student or a resident who has extenuating circumstances and cannot audition in-person, please notify Professor Dan Willett (contact information below) and submit a video recording (a DVD coded for the United States or the URL for a video posted to YouTube or another appropriate website), with repertoire representing three of the following periods: Baroque, Classical, Romantic, or Contemporary. (See additional information for voice applicants below.) MM jazz performance and pedagogy applicants should contact the Director of Jazz Studies to confirm the audition repertoire for video submissions. Applicants who audition initially by recording may be required to participate in a videoconference interview (Skype, iChat, etc.) or to audition on campus at a later time.

### CONTACT INFORMATION:

Professor Dan Willett, Associate Director  
 School of Music  
 215 Fine Arts Building  
 Columbia, MO 65211-6120  
 WillettD@missouri.edu  
 573-882-0933

John Sligh, Admissions Coordinator, School of Music  
 150 Fine Arts Building  
 Columbia, MO 65211-6120  
 music@missouri.edu  
 573-882-4471

## Graduate Audition Days

For students planning to enter in the Fall 2013 semester:

### Audition Date 1: Monday, February 4, 2013

Applicants interested in auditioning and/or interviewing on this date must register by Friday January 18, 2013 (for domestic students) or by Friday January 11, 2013 (for international students).

### Audition Date 2: Monday, February 25, 2013

Applicants interested in auditioning and/or interviewing on this date must register by Monday, February 11, 2013 (for domestic students) or by Monday, February 4, 2013 (for international students).

### Audition Date 3: Monday, March 4, 2013

Applicants interested in auditioning and/or interviewing on this date must register by Monday, February 18, 2013 (for domestic students) or by Monday, February 11, 2013 (for international students).

- Students who are unable to audition on one of these dates must contact the Admissions Coordinator of the School of Music (contact information below) to determine if an alternate date can be arranged.
- Students interested in spring semester matriculation should contact the Associate Director of the School of Music (contact information below).

## Audition/Interview Information by Area

**Piano:** click here for detailed audition requirements for all MM piano programs (collaborative, pedagogy, and performance).

**Voice:** eight selections required, including at least one operatic aria and selections in French, Italian, German, and English.

**Jazz Performance and Pedagogy:** Please see the audition requirements for the Graduate Certificate in Jazz Studies and contact the Director of Jazz Studies for more information.

**Other Applied Areas:** contact the appropriate applied faculty member for information about audition repertoire and procedures.

**Composition:** submit representative original compositions and register for an interview. Portfolio materials are due by the Priority Application Deadline.

**History/Theory:** submit examples of written scholarly work and register for an interview. Portfolio materials are due by the Priority Application Deadline.

**Conducting applicants** should arrange an audition and interview with the appropriate faculty member:

- Dr. R. Paul Crabb, Choral Conducting
- Professor Edward Dolbashian, Orchestral Conducting
- Dr. D. Bradley Snow, Wind Ensemble Conducting

**Additional information for Choral Conducting applicants:** Students applying for MM in Choral Conducting or PhD in Music Education with choral emphasis will rehearse one MU choir for 15-20 minutes (music will be assigned and sent to you before the audition); take a short conducting lesson on the same music; sing a prepared aria or art song; demonstrate proficiency in sight-reading and ear-training; demonstrate basic piano proficiency.

## Course of Study

MUS_H_LI 8313	Introduction to Graduate Study	2
MUS_H_LI 8314	Introduction to Graduate Studies in Music II	1
7xxx-8xxx	Music History courses	8-10
MUS_GENL 8090	Research in Music	4-8
7xxx-8xxx	Advanced Theory courses	4-8
MUS_APMS 7455	Studio Instruction	2-8

7xxx Non-music electives	2-4
MUS_ENS 8841 Instrumental Ensemble or MUS_ENS 8842 Choral Ensemble	1
At least 15 credits must be at 8000 level	
<b>Total credits:</b>	<b>33</b>

## Degree Completion Requirements

In addition to studies in the major field, required studies include performance, theory, research skills, and electives. Specific requirements include the following:

- Proficiency Exams (<http://music.missouri.edu/graduate/requiredexams.html>) in music theory and music history are administered during new student orientation and two other times each year.
- Applied auditions for non-performance majors will be held to determine studio placement and level of study.
- Each MA candidate must pass a Comprehensive Exam. (<http://music.missouri.edu/graduate/requiredexams.html>)
- MA degree candidates must satisfactorily complete a thesis on an approved topic and must pass a final oral examination, administered by a faculty committee, about their projects.
- Graduation Approval: A signed report by the faculty thesis committee must be forwarded to the Graduate School before graduation can be approved for any MA candidate.

## MM in Music

### About the MM

The principal function of the MM program is to provide students with opportunities for continued development of their musical talents--in a specific area--and overall musicianship. This degree is designed to prepare the graduate for a career in performance or composition, teaching, or continued graduate studies toward a doctoral degree.

### Prerequisites

Entrance into the MM degree program requires completion of a Bachelor of Music degree (or demonstrated equivalent) normally with the same major as that to be pursued at the graduate level, **and a GPA of 3.0 in the last 60 credit-hours**. In the event that a candidate does not meet the required prerequisites for a specific curriculum (listed below), then appropriate course(s) may be added to the degree program as additional requirements

#### WOODWIND, BRASS, PERCUSSION, OR STRING PERFORMANCE

- Senior recital

#### VOCAL PERFORMANCE

- Senior recital
- Proficiency in French, Italian, and German languages and diction.

#### PIANO PERFORMANCE

- Senior Recital
- 1 upper-level music history course
- 3 credits of 18th-century counterpoint

#### COLLABORATIVE PIANO

- Senior Recital
- 2 courses in either French or German
- 2 courses in French, German, or Italian diction
- 1 upper-level music history course
- 3 credits in 18th-century counterpoint

#### PIANO PEDAGOGY

- 1 upper-level music history course
- 3 credits in 18th-century counterpoint
- A senior recital and undergraduate courses in piano pedagogy or teaching experience are desirable, but not required for admission.

#### JAZZ PERFORMANCE AND PEDAGOGY

- Senior Recital

#### THEORY

- 3 credits of 18th- or 16th-century counterpoint
- 2 credits of orchestration
- 2 credits of a theory elective
- 4 credits of music history (equivalent study to Music 2307-2308)
- 16 credits of applied instruction (or equivalent)

#### COMPOSITION

- 3 credits of 18th- or 16th-century counterpoint
- 2 credits of orchestration
- 8 credits of composition
- 4 credits of music history (equivalent study to Music 2307-2308)
- 16 credits of applied instruction (or equivalent)

#### CONDUCTING (Choral, Orchestral, or Wind Ensemble)

- 2 undergraduate conducting courses
- Previous conducting experience
- Proficiency in French, Italian, and German diction (Choral Conducting only)
- Proficiency in vocal pedagogy (Choral Conducting only)

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School of Music

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WillettD@missouri.edu  
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**Additional information for Choral Conducting applicants:** Students applying for MM in Choral Conducting or PhD in Music Education with

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## Degree Completion Requirements

In addition to the major field, required studies for all MM degrees include performance, music history, theory, research skills, and electives. See Courses of Study, under Resources (above). Specific requirements include the following:

- Proficiency Exams (<http://music.missouri.edu/graduate/requiredexams.html>) in music theory and music history are administered during new student orientation and two other times each year.
- Applied auditions for non-performance majors will be held to determine studio placement and level of study.
- Each candidate for the MM degree must pass a Comprehensive Exam (<http://music.missouri.edu/graduate/requiredexams.html>).
- All Performance majors present a Graduate Recital. In addition, piano majors present a memorized performance of a concerto with orchestra or second piano. Collaborative piano majors are required to present three recitals: one is a combined solo and chamber music recital; the other two are to be given as accompanist to a vocalist and an instrumentalist, respectively. Conducting majors must present two conducting recitals, each 45 minutes in length. A recital hearing is required before any recital presented for credit, including all degree recitals. The hearing must be scheduled at least two weeks before the date of the recital.
- Music Theory majors must satisfactorily complete a thesis on an approved topic, and Composition majors must complete a substantial compositional project. Both Music Theory and Composition majors must pass a final oral examination, administered by a faculty committee, about their projects.
- Graduation Approval: A signed report by the faculty committee (normally the Comprehensive Exam committee) must be forwarded to the Graduate School indicating the satisfactory completion of these requirements before graduation can be approved for any student in the MM degree program.

## Philosophy

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R. N. Johnson, Chair  
College of Arts and Science  
438 Strickland Hall  
(573) 882-2871  
Fax: (573) 884-8949  
philosophy@missouri.edu  
<http://missouri.edu/philosophy>

The Department of Philosophy offers a wide variety of undergraduate and graduate courses, including courses on applied ethics, ethical theory, epistemology, logic, metaphysics, philosophy of mind, philosophy of language, philosophy of religion, philosophy of science, philosophy of biology, decision theory, political philosophy, non-Western philosophy, and the history of philosophy. The study of philosophy is not only fascinating in its own right but practical too, since it encourages the development of marketable intellectual abilities. These include the abilities to read, think, and write about conceptually complex and abstract material, and to construct and analyze elaborate chains of reasoning. Philosophy majors go on to pursue careers in such fields as law, medicine, business, the non-profit sector, the church, and academia.

The department offers BA, MA, and PhD degrees in philosophy, as well as an undergraduate minor.

### Faculty

**Professor** J. J. Bien\*\*, B. Gupta\*\*, R. N. Johnson\*\*, P. J. Markie\*\*, M. S. McGrath\*\*, A. Melnyk\*, D. E. Sievert\*, P. L. Vallentyne\*\*, P. Weirich\*\*

**Associate Professor** A. Arieuw\*\*, S. Chant\*, Z. Ernst\*, C. S. Horisk\*\*, P. Robbins\*\*

**Assistant Professor** K. Boyce, M. Folescu, A. Radulescu

**Professor Emeritus** W. B. Bondeson\*, J. H. Kultgen\*

**Associate Professor Emeritus** A. von Schönborn\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 247)
- BA in Philosophy (p. 248)
- Minor in Philosophy (p. 249)

### Double and Dual Majors

A philosophy major can be paired with a major in another department. Students must meet the requirements of both departments. The program for each department must be approved by the advisor for that department.

### Graduate

College of Arts and Science  
438 Strickland Hall  
573-882-2871

<http://philosophy.missouri.edu/>

**Director of Graduate Studies:** Phillip Robbins

- MA in Philosophy (p. 249)
- PhD in Philosophy (p. 249)

### About the Program

The philosophy department provides excellent training in both research and teaching. The nationally and internationally renowned faculty have expertise in the core areas of philosophy, with particular strength in epistemology, ethics, philosophy of mind and political philosophy, and also in various specialties; these include philosophy of biology, Asian philosophy, experimental philosophy, and the foundations of decision and game theory. With 15 full time faculty and around 25 graduate students, we offer a supportive community for pursuit of the MA and the PhD, with a broad range of courses, rigorous training, attentive, high-quality advising, the opportunity to develop a professional network through our series of colloquia and conferences, and help in every aspect of job seeking. We give students the advice and support they need to present their work at regional and national conferences, and to publish in professional journals, before they begin to look for jobs. We also give our students extensive training and experience in teaching, including assistantships with award-winning teachers.

Although we award an MA degree, we **only admit students to our PhD program** (with the MA obtained in the process).

We receive about 50 applications per year and offer funding to about 10-15% of these. The average scores for students we admit are: GRE Verbal 650, GRE Quantitative 700, and GPA in the major (normally philosophy) 3.9. Of course, our decisions are also based on the writing sample, letters of reference, and other factors, such as degree of fit with the department.

### Professional Development

Presentation of research at professional meetings and publication by graduate students is encouraged. Prominent off-campus philosophers visit the department yearly for talks and symposia. Twice yearly, the Florence G. Kline endowment sponsors an intensive workshop at which papers on a special topic are presented by several leading figures in philosophy.

### Financial Aid from the Program

Fellowships and teaching assistantships are available to qualified students. Applications for fellowships must meet Graduate School deadlines, usually in January. Applications for teaching assistantships must meet the department deadline of January 15.

## Undergraduate

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## Department Level Requirements - Philosophy

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### Departmental Honors

To earn a BA with honors in philosophy, a student must earn a 3.3 GPA in all courses, and a 3.7 GPA in all philosophy courses; meet all the standard requirements for the regular philosophy major; in addition take PHIL 4998 Honors I in Philosophy, and PHIL 4999 Honors II

in Philosophy, writing a satisfactory senior thesis normally of 8,000 to 10,000 words under the guidance of a faculty member who has consented to work with the student; and pass an oral examination on the thesis before a committee of three members of the philosophy faculty.

## BA in Philosophy

### Major Program Requirements

Undergraduates pursuing a major in philosophy must meet all the non-philosophy requirements for a BA degree in the College of Arts and Science, including university general education (p. 18) requirements. In addition, however, they must complete a non-philosophical minor that consists of at least 15 credits in a single department, including at least 6 credits at the 2000 level or above. Finally, they must earn 30 credits in philosophy, with a grade of "C-" or above in every course, in accordance with the following rules:

#### Major core requirements

##### History of Philosophy: two courses required

PHIL 3000	Ancient Western Philosophy	3
PHIL 3200	Modern Philosophy	3

##### Logic: one course required

PHIL 2700	Elementary Logic	3
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##### Focus Area 9

Three courses must be selected from one of the following focus areas:

#### A. Core Philosophy

PHIL 4100	Philosophy of Language
PHIL 4200	Metaphysics
PHIL 4210	Philosophy of Mind
PHIL 4300	Epistemology
PHIL 4400	Philosophy of Science
PHIL 4500	Theories of Ethics
PHIL 4600	Political and Social Philosophy

#### B. Knowledge, Language, and Reality:

PHIL 4100	Philosophy of Language
PHIL 4200	Metaphysics
PHIL 4210	Philosophy of Mind
PHIL 4300	Epistemology

#### C. Mind, Brain, and Language

PHIL 4100	Philosophy of Language
PHIL 4210	Philosophy of Mind
PHIL 4300	Epistemology
PHIL 4420	Philosophy of Biology

#### D. Ethics, Law Public Policy

PHIL 4500	Theories of Ethics
PHIL 4600	Political and Social Philosophy
PHIL 4610	Philosophy of Law

#### E. Logic and Decision

PHIL 4110	Advanced Logic
PHIL 4120	Selected Topics in Logic
PHIL 4130	Probability and Induction

#### F. Philosophy of Science

PHIL 4130	Probability and Induction
PHIL 4420	Philosophy of Biology
PHIL 4400	Philosophy of Science
Capstone experience	3
PHIL 4950	Senior Seminar in Philosophy
Philosophy electives	9
<b>Total Credits</b>	<b>30</b>

1. No course can be used to fulfill more than one of the above requirements, AND
2. No more than two philosophy courses below the 2000-level can count toward the major.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
Composition	3	PHIL 2430	3
MATH 1100	3	Foreign Language II	5
Foreign Language I	5	Foundation Requirement Course	3
PHIL 1100	3	Foundation Requirement Course	3
	<b>14</b>		<b>14</b>
Second Year			
Fall	Credits	Spring	Credits
PHIL 2700	3	PHIL 3000	3
Foreign Language III	3	Foundation Requirement Course	3
Foundation Requirement Course	3	Foundation Requirement Course	3
Foundation Requirement Course	3	Foundation Requirement Course	3
Foundation Requirement Course	3	Minor Course	3
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
PHIL 3200	3	PHIL 4500	3
Foundation Requirement Course	3	Foundation Requirement Course	3
Foundation Requirement Course	3	Minor Course	3
Foundation Requirement Course	3	Elective Course	3
Minor Course	3	Elective Course	3
	<b>15</b>		<b>15</b>
Fourth Year			
Fall	Credits	Spring	Credits
PHIL 4210	3	PHIL 4950	3
PHIL 4200	3	PHIL 4300	3
Minor Course	3	Minor Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
	<b>15</b>		<b>15</b>
Total Credits: 118			



## Minor in Philosophy

To earn a minor in philosophy, students must first gain the permission of their academic unit. Students must earn 15 credit hours in philosophy, including at least one course at the 4000-level and one further course at the 3000 or 4000-level. PHIL 4998 and PHIL 4999 do not contribute to the minor.

## Graduate

### MA in Philosophy

#### About the Master of Arts in Philosophy

At this time, our Department is not admitting students who are seeking a terminal master's degree. However, our doctoral students earn an MA degree en route to the PhD.

Please see the admission criteria for our doctoral degree program (p. 249).

#### Admission Contact Information

Paul Weirich  
College of Arts and Science  
Department of Philosophy  
415 Strickland Hall  
573 882-6760

#### Master of Arts Degree Completion Requirements

- 30 semester hours of graduate work, 15 of which must be at the 8000 level.
- At least 80 percent of the hours submitted for the master's program must be completed with a grade of A or B.
- A distribution of graduate courses including a proseminar for all first year students, one course in the history of philosophy and one course in either ethics, political philosophy, metaphysics, or epistemology.
- A thesis or two papers of format and topic appropriate for a refereed paper in a major journal, displaying sustained research and philosophical analysis, and an oral defense of the thesis or papers.

### PhD in Philosophy

#### Admission Contact Information

Paul Weirich  
College of Arts and Science  
Department of Philosophy  
415 Strickland Hall  
573 882-6760

**Note:** Although we award the MA degree, we only admit students to our PhD program (with the MA obtained in the process). Any unusual circumstances regarding failure to meet the minimum requirements should be called to the attention of the director of graduate admissions.

## Admission Process

In order to be considered for our graduate program, the following steps need to be completed (including receipt of transcripts and test scores) by January 15th:

1. Arrange for all relevant official transcripts to be sent directly to the Graduate School by your college or university (student copies are not acceptable).
2. Arrange with Educational Testing Services for your GRE scores to be sent directly to the Graduate School (MU's school code is 6875; philosophy's department code is 2801). Only electronic scores are acceptable.
3. International students also should arrange for their TOEFL scores to be sent directly to the Graduate School (MU's school code is 6875; philosophy's department code is 2801). The minimum required scores are 100 (internet) total with a speaking score of at least 23 (internet). (For more information about scores, see Graduate School TOEFL policy.)
4. Complete the basic information in online Graduate School application.
5. Upload a 750-word Statement of Interest to the Supplemental Information section of the on-line Graduation School application form. It should explain why are you are interested in graduate study in philosophy at the University of Missouri. We encourage you to address, if you wish, how you can advance the department's commitment to diversity.
6. Upload a sample of your 15-25 page philosophical writing (e.g., a paper or thesis chapter) to the Supplemental Information section of the on-line Graduation School application form. For the sake of blind evaluation, do not include your name on the sample you upload.
7. In the Recommendation section of the on-line Graduate School application form, enter the information for three letters of recommendation regarding your academic potential. You should first obtain agreement from the professors writing these letters. They will be contacted by e-mail to submit their letters electronically. If a professor is unable to send his/her letters electronically, you should still enter all his/her information in the Recommendation section, but you should write "(off-line)" immediately after her name.
8. A hardcopy of the recommendation should then be sent to the Director of Graduate Studies, Department of Philosophy University of Missouri, Columbia, MO 65211-4160. Because all other materials are electronic, hardcopies often do not receive the same attention. It is thus in your strong interest to have your letters submitted electronically.
9. Complete the Department Philosophy application form (<http://philosophy.missouri.edu/graduate/apply.html>).

## Admission Criteria

Fall deadline: January 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100*	600

\* Speaking score of at least 23

- Average GRE scores:

When did you take the GRE?	Verbal	Quantitative
Prior to August 1, 2011	650	700
On or After August 1, 2011	163	155

- Eligibility for any graduate work in philosophy requires the equivalent of the following six undergraduate courses in philosophy: formal logic, ethics, ancient philosophy, modern philosophy, epistemology, and metaphysics.
- Deficiencies may be made up after the student is enrolled at MU.
- Average GPA in the major: 3.9

## Required Application Materials

### *To the Graduate School*

- All required Graduate School documents
- 3 letters of recommendation (submission through the online application system strongly preferred, but postal mail submission directly to the department allowed)
- Statement of interest (upload to the online application)
- Writing sample (upload to the online application)
- Departmental application (download this from [philosophy.missouri.edu/graduate/apply.html](http://philosophy.missouri.edu/graduate/apply.html) and then upload to the online application).

### *To the Philosophy Program*

- GRE score report (electronic only)

## Qualifying Exam

Qualification for the PhD program is established by a qualifying examination (typically by superior performance on the MA research requirement).

## Graduation Requirements for the PhD

- 72 hours of course work in philosophy, with at least 42 hours of regular course work.
- A distribution of graduate courses including an introductory seminar for all first year students, two advanced courses in logic, two courses in the history of philosophy, and one course in each of ethics, epistemology, and metaphysics.
- A written and oral dissertation proposal requirement designed to ensure the student's familiarity with the relevant philosophical literature and ability to analyze philosophical issues. A dissertation and a final oral examination on the dissertation.

## Physics

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Peter Pfeifer, Chair  
College of Arts and Science  
223 Physics Building  
(573) 882-3335  
Fax: (573) 882-4195  
<http://www.physics.missouri.edu/>

Physics is the science that studies the structure and properties of matter and transformations of energy. With math as the language and experimental verification as a guide, physical study has established the fundamental laws of nature that are the foundation of all natural science and technology. The study of physics includes learning the general principles and the phenomena that have been discovered and developing the skills that enable such knowledge to be advanced through research.

The Department of Physics and Astronomy offers a major in physics with either a Bachelor of Arts or a Bachelor of Science Degree. The BA degree provides a broad coverage of classical and modern physics while permitting a broader liberal arts education. It is normally selected by students who do not envision a professional career in physics, but plan to enter a professional school later in their academic career, e.g. medicine, dentistry or law, or who desire to pursue a teaching certificate. The BS degree in Physics is designed to prepare students for scientific careers immediately upon graduation, for further training in graduate school, or for teaching high school physics. A minor in physics or astronomy is also available.

Physics education plays a pivotal role in such areas of burgeoning and societal importance as biomedical optical imaging/biomedicine, materials science, and homeland security. Therefore, the Department of Physics has introduced several new courses and electives to train undergraduate students in optical sciences, biological physics, materials sciences and nanotechnology.

## Faculty

**Professor** H. R. Chandrasekhar\*\*, M. Chandrasekhar\*\*, S. J. Chen\*\*, R. V. Duncan, G. Forgacs\*\*, S. Gangopadhyay\*\*, Linda Godwin\*\*, M. F. Hawthorne\*, K. Katti\*\*, S. M. Kopekin\*\*, I. Kosztin\*\*, A. Li\*\*, B. Mashhoon\*\*, P. Miceli\*\*, P. Pfeifer\*\*, S. Satpathy\*\*, A. Speck\*\*, H. Taub\*\*, G. Vignale\*\*, C. Wexler\*\*

**Associate Professor** S. Guha\*\*, D. Hanuscin\*, W. T. Montfroofij\*\*, C. Ullrich\*\*, P. Yu\*\*, X. Zou\*\*

**Assistant Professor** S. Bompadre, G. King, O. Vajk, H. Yan

**Teaching Professor** D. C. Kosztin\*

**Associate Teaching Professor** Y. Zhang\*

**Assistant Teaching Professor** K. King\*

**Adjunct Professor** S. M. Badalyan, S. Balasubramanian, C. Chicone\*, P. Cornish\*, F. Y. Hansen, F. Hehl, A. Helfer\*, H. Kaiser, A. Neagu, Z. S. Popovic, W. Yelon\*

**Adjunct Associate Professor** X. Fan, J. Farmer#

**Professor Emeritus** D. L. Cowan, B. DeFacio, P. Plummer, J. J. Rhyne, G. Schupp, C. W. Tompson, S. A. Werner, H. W. White#, J. E. Willett

**Associate Professor Emeritus** C. J. Peterson

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 252)
- BA in Physics (p. 253)
- BS in Physics (p. 253)
  - with emphasis in Astronomy (p. 254)
- Minor in Physics (p. 255)

## Elective Tracks

Students have available a variety of courses from which they may select the required credits of physics electives for the BS or BA degree. The department offers tracks that allow students to specialize in astronomy, biological physics, condensed matter physics, energy storage, materials science, nanomaterials, or optoelectronics. Students may wish to pursue one of these tracks, or follow a general track in which they can choose any of the courses that are listed and are not required courses.

Note: Tracks are not indicated on the diploma.

## Foreign Language Alternative (BS)

Students who elect an undergraduate program leading to the BS degree with a major in Physics have an option regarding the College of Arts and Science foreign language requirement. This requirement of 12 or 13 credits (depending on the language studied) may be satisfied alternatively by the substitution of an approved specialization. This consists of a minimum of 12 credits at the 2000/3000 level or above and may not include courses normally required of all physics majors. It is to be selected from an area with special relevance to physics and to the student's own interests and future plans.

Students have selected options in aerospace engineering, atmospheric science/geophysical fluid dynamics, radiation biology, chemistry, computer science, electrical engineering (circuits or computer hardware option), geology, nuclear engineering, material science, math and other areas. The choice and planning of an option must be done under the direction of the departmental undergraduate advisor.

## Dual Degrees and Double Majors

Students may wish to pursue two baccalaureate dual degrees simultaneously. For example, this might include a BS in Physics and a BS in Engineering, which is the most common choice. In order to receive two baccalaureate degrees, a student must complete a minimum of 132 credits and complete all the specified requirements for both degrees.

Another degree option is a single baccalaureate degree with two majors (double majors), which may be developed with the concurrence of appropriate advisors in the two departments. A notation of the successful completion of the two areas appears on the student's transcript. Both departments must be in the College of Arts and Sciences. Double major options often chosen by a physics major are chemistry, mathematics or geology. Mathematics is a particularly viable double major because the extensive mathematics component normally required in the BS degree with a major in physics, if coupled with a specialization area chosen from mathematics, nearly completes the BS degree with a major in mathematics.

Careful planning, started early in the academic career, is required to meet the conditions of dual majors or dual degrees. Students who complete such programs obtain the maximum from their undergraduate experience.

## Graduate

Department of Physics & Astronomy

223 Physics Building

573-882-3335

<http://physics.missouri.edu/graduate-program/program-overview/>

**Director of Graduate Studies:** Carsten Ullrich

424 Physics Building

573-882-2467

- MS in Physics (p. 255)
- PhD in Physics (p. 256)
- Graduate Certificate in Teaching High School Physics (p. 258)

## About Physics

At the University of Missouri, the physics degrees are offered by the Department of Physics and Astronomy. Because the Department has a moderate size, graduate students are better able to maintain a close relationship with the faculty. Our facilities include various laboratories within the Physics Building as well as the Research Reactor. In certain cases, a student's work may be done in collaboration with other science and engineering departments.

The largest research area is in experimental and theoretical condensed-matter physics. Graduates in these fields have been very successful in continuing their careers in industry and academics. Other research programs in which thesis work may be accomplished are biological physics and astronomy/astrophysics.

## Research Resources

The Department of Physics and Astronomy offers many opportunities for scientific research in internationally recognized programs, some of which are unique at a university and at a level expected only in much larger departments. The main focus of research is in the areas of theoretical and experimental condensed matter physics, biological physics, astrophysics, and alternative energy. These research efforts are fostered by the existence of the University of Missouri Research Reactor (MURR), a 10 MW light-water moderated reactor that is the highest-power university research reactor in the country. Furthermore, many research activities involve facilities at National Laboratories such as Argonne, Oak Ridge, or NIST.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## More Details

For more details on the Physics graduate program please consult the departmental web site: <http://physics.missouri.edu/graduate-program/program-overview/>

In particular, details about degree requirements, rules and regulations can be found in the Physics graduate handbook

(<http://physics.missouri.edu/wp-content/uploads/2012/08/fileGradStudentHandbook.pdf>).

## Undergraduate

### Department Level Requirements - Physics

Candidates for both degrees must complete 120 credits with an average grade of C or better. For the BA in physics degree, students must complete 30 credits in physics and 19 credits in math and chemistry. For the BS in physics degree, students must complete 45 credits in physics and 25 credits in math and chemistry. Students pursuing a Bachelor of Science in Secondary Education, emphasis in Physics, have the option of receiving a BS in physics degree by completing 33 credits in physics and 19 hours in math and chemistry. In addition, students must meet all degree, college, and university requirements including University general education. All students who complete the BS degree in Physics automatically also complete a minor in Mathematics.

### Departmental Honors

The departmental honors program in physics provides exceptional students with an opportunity to develop skills beyond the normal course work. It also acknowledges those students who have attained a level of achievement beyond what is normally expected of an undergraduate physics major.

To receive an honors degree with a major in physics, a student must meet the following criteria:

- Satisfy the BA or BS degree requirements
- Cumulative GPA of at least 3.30 and minimum GPA of 3.50 in Physics Department courses
- Complete a six credit hours research sequence, by signing up for PHYSCS 4950/ASTRON 4950 Undergraduate Research in Physics/Astronomy in the first (second) semester junior year and for PHYSCS 4950/ASTRON 4960 Senior Thesis (or PHYSCS 4950/ASTRON 4950 again) in the first (second) semester senior year. In PHYSCS 4950/ASTRON 4950 students will work on a research project, either by doing research in a lab or by doing reading research and completing specific readings under the supervision of a faculty adviser.
- Present the results of the research project in a poster or in a paper prepared in the form of a scientific journal article at a regional or national meeting, to a faculty panel that will consist of no fewer than three Physics Department faculty members, or in a physics seminar.

In order to receive departmental honors recognition, the student must be recommended by the director of undergraduate studies. Upon recommendation, the Office of the University Registrar will be notified that the candidate has earned departmental honors recognition. This acknowledgement will appear on the student's diploma as well as on the transcript.

## BA in Physics

### Major Program Requirements

Students must complete the University of Missouri's general education requirements and the Department Level Requirements (p. 252), in addition to the Major Program Requirements below.

PHYSICS 2800	Undergraduate Seminar in Physics	2
PHYSICS 2750 & PHYSICS 2760	University Physics I and University Physics II	10
PHYSICS 3150	Introduction to Modern Physics	3
PHYSICS 4080	Major Themes in Classical Physics	3
MATH 1500 & MATH 1700 & MATH 2300	Analytic Geometry and Calculus I and Calculus II and Calculus III	13
MATH 4100	Differential Equations	3
CHEM 1320	College Chemistry I	4
<b>Electives:</b>		
Additional physics/astronomy		12
Total Credits		50

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500 <sup>^</sup>	5	MATH 1700 <sup>^</sup>	5
PHYSICS 2800 <sup>^</sup>	2	PHYSICS 2750 <sup>^</sup>	5
ENGLSH 1000 <sup>*</sup>	3	Humanities/Fine Arts Course <sup>*</sup>	3
HIST 1100, 1200, or POL_SC 1100 <sup>*</sup>	3		
	13		13
Second Year			
Fall	Credits	Spring	Credits
MATH 2300 <sup>^</sup>	3	MATH 4100 <sup>^</sup>	3
PHYSICS 2760 <sup>^</sup>	5	PHYSICS 3150 <sup>^</sup>	3
Foreign language (level 1) <sup>*</sup>	5	Foreign language (level 2) <sup>*</sup>	5
Elective Course	3	Behavioral Science Course <sup>*</sup>	3
		Elective Course	3
	16		17
Third Year			
Fall	Credits	Spring	Credits
PHYSICS 4080 <sup>&amp;</sup>	3	PHYSICS elective <sup>^</sup>	3
PHYSICS elective <sup>^</sup>	3	CHEM 1320 <sup>^</sup>	4
Foreign language (level 3) <sup>*</sup>	3	2000-level Humanities/Fine Arts Course (Writing Intensive) <sup>*</sup>	3
Social Science Course <sup>*</sup>	3	Elective Course	3

2000-level Behavioral Science Course <sup>*</sup>	3	Elective Course	3
	15		16
Fourth Year			
Fall	Credits	Spring	Credits
PHYSICS Elective/Research Course <sup>^</sup>	3	PHYSICS elective/research <sup>^</sup>	3
Humanities/Fine Arts Course <sup>*</sup>	3	Humanities and fine arts course <sup>*</sup>	3
2000-level Social Science Course <sup>*</sup>	3	Elective Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
	15		15
Total Credits: 120			

<sup>^</sup> Course meets degree program requirements

<sup>\*</sup> Course meets University general education and/or campus graduation requirements

## BS in Physics

### Major Program Requirements

Students must complete the University general education (p. 18) requirements and the Department Level Requirements (p. 252) in addition to the Major Program Requirements below.

PHYSICS 2800	Undergraduate Seminar in Physics	2
PHYSICS 2750 & PHYSICS 2760	University Physics I and University Physics II	10
PHYSICS 3150	Introduction to Modern Physics	3
PHYSICS 4060	Advanced Physics Laboratory I	3
PHYSICS 4100	Electricity and Magnetism I	3
PHYSICS 4120	Introduction to Thermodynamics	3
PHYSICS 4140	Mechanics	3
PHYSICS 4800	Introduction to Quantum Mechanics I	3
PHYSICS 4810	Introduction to Quantum Mechanics II	3
MATH 1500 & MATH 1700 & MATH 2300	Analytic Geometry and Calculus I and Calculus II and Calculus III	13
MATH 4100	Differential Equations	3
CHEM 1320	College Chemistry I	4
<b>Electives</b>		
Additional physics/astronomy		12
Additional math		6
Total Credits		71

### Major Core Requirements for the BS Program for Science Education Majors

This degree is available only to students who are also pursuing a Bachelor of Science in Education, emphasis in Physics education.

PHYSICS 2800	Undergraduate Seminar in Physics	2
PHYSICS 2750 & PHYSICS 2760	University Physics I and University Physics II	10
PHYSICS 3150	Introduction to Modern Physics	3

PHYSICS 4060	Advanced Physics Laboratory I	3
PHYSICS 4080	Major Themes in Classical Physics	3
PHYSICS 4110	Light and Modern Optics	4
MATH 1500 & MATH 1700 & MATH 2300	Analytic Geometry and Calculus I and Calculus II and Calculus III	13
MATH 4100	Differential Equations	3
CHEM 1320	College Chemistry I	4
<b>Electives:</b>		
Additional physics/astronomy (a student must select 3 courses from the list below)		12
PHYSICS 3010	Introduction to Modern Astrophysics	3
PHYSICS 3100	Teaching Physics	3
PHYSICS 4050	Electronic Laboratory	4
PHYSICS 4180	Solar System Science	3
PHYSICS 4190	Physics and Chemistry of Materials	3
Total Credits		73

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500 <sup>^</sup>	5	PHYSICS 2750 <sup>^</sup>	5
General Education <sup>*</sup>	3	MATH 1700 <sup>^</sup>	5
CHEM 1320 <sup>^</sup>	4	General Education <sup>*</sup>	3
ENGLISH 1000 <sup>*</sup>	3		
PHYSICS 2800	2		
	17		13
Second Year			
Fall	Credits	Spring	Credits
PHYSICS 2760 <sup>^</sup>	5	PHYSICS 3150 <sup>^</sup>	3
MATH 2300 <sup>^</sup>	3	MATH 4100 <sup>^</sup>	3
General Education <sup>*</sup>	3	PHYSICS 4140 <sup>^</sup>	3
General Education <sup>*</sup>	3	General Education <sup>*</sup>	3
		Specialized/Foreign Language	3
	14		15
Third Year			
Fall	Credits	Spring	Credits
PHYSICS 4100 <sup>^</sup>	3	PHYSICS 4120 <sup>^</sup>	3
PHYSICS Elective <sup>^</sup>	3	Physics Elective <sup>^</sup>	3
MATH 4500 <sup>^</sup>	3	Math Elective <sup>^</sup>	3
PHYSICS 4060 <sup>^</sup>	3	General Education <sup>*</sup>	3
Specialized/Foreign Language <sup>*</sup>	3	Specialized/ Foreign Language <sup>*</sup>	3
	15		15

Fourth Year			
Fall	Credits	Spring	Credits
PHYSICS 4800 <sup>^</sup>	3	PHYSICS 4810 <sup>^</sup>	3
PHYSICS Elective <sup>^</sup>	3	PHYSICS 4985 <sup>^</sup>	3
PHYSICS Elective <sup>^</sup>	3	PHYSICS Elective <sup>^</sup>	3
Specialized/Foreign Language <sup>*</sup>	3	Electives/Research	3
	12		12
Total Credits: 113			

<sup>^</sup> Course meets degree program requirements

<sup>\*</sup> Course meets University general education and/or campus graduation requirements

## BS in Physics with emphasis in Astronomy

### Major Program Requirements

Students must complete the University general education (p. 18) requirements and the Department Level Requirements (p. 252) in addition to the Major Program Requirements below.

PHYSICS 2800	Undergraduate Seminar in Physics	2
PHYSICS 2750 & PHYSICS 2760	University Physics I and University Physics II	10
PHYSICS 3150	Introduction to Modern Physics	3
PHYSICS 4060	Advanced Physics Laboratory I	3
PHYSICS 4100	Electricity and Magnetism I	3
PHYSICS 4120	Introduction to Thermodynamics	3
PHYSICS 4140	Mechanics	3
PHYSICS 4800	Introduction to Quantum Mechanics I	3
PHYSICS 4810	Introduction to Quantum Mechanics II	3
MATH 1500 & MATH 1700 & MATH 2300	Analytic Geometry and Calculus I and Calculus II and Calculus III	13
MATH 4100	Differential Equations	3
CHEM 1320	College Chemistry I	4
<b>Electives</b>		
Additional physics/astronomy		12
Additional math		6
Total Credits		71

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500 <sup>^</sup>	5	PHYSICS 2750 <sup>^</sup>	5
General Education <sup>*</sup>	3	MATH 1700 <sup>^</sup>	5
CHEM 1320 <sup>^</sup>	4	General Education <sup>*</sup>	3

ENGLISH 1000*	3		
PHYSICS 2800	2		
	17		13
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
PHYSICS 2760 <sup>^</sup>	5	PHYSICS 3150 <sup>^</sup>	3
MATH 2300 <sup>^</sup>	3	MATH 4100 <sup>^</sup>	3
General Education*	3	PHYSICS 4140 <sup>^</sup>	3
General Education*	3	General Education*	3
		Specialized/Foreign Language	3
	14		15
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
PHYSICS 4100 <sup>^</sup>	3	PHYSICS 4120 <sup>^</sup>	3
PHYSICS Elective <sup>^</sup>	3	Physics Elective <sup>^</sup>	3
MATH 4500 <sup>^</sup>	3	Math Elective <sup>^</sup>	3
PHYSICS 4060 <sup>^</sup>	3	General Education*	3
Specialized/Foreign Language*	3	Specialized/ Foreign Language*	3
	15		15
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
PHYSICS 4800 <sup>^</sup>	3	PHYSICS 4810 <sup>^</sup>	3
PHYSICS Elective <sup>^</sup>	3	PHYSICS 4985 <sup>^</sup>	3
PHYSICS Elective <sup>^</sup>	3	PHYSICS Elective <sup>^</sup>	3
Specialized/Foreign Language*	3	Electives/Research	3
	12		12
Total Credits: 113			

<sup>^</sup> Course meets degree program requirements

\* Course meets University general education and/or campus graduation requirements

## Minor in Physics

A student whose area of concentration is in another department may receive a minor in physics with the completion of the following courses with grades of C or better: PHYSICS 2750, PHYSICS 2760: University Physics (10 credits) plus three additional courses at the 2000/3000 level or above (to include at least one course dealing with topics in modern physics). In order to complete these requirements, the student must complete mathematics through MATH 4100 Differential Equations.

Conversely, a student whose area of concentration is physics may pursue a minor in another department in the College of Arts and Sciences.

## Graduate

## MS in Physics

### About the Master of Science

The master of science degree in physics prepares students for a variety of scientific careers. Since physics is the most fundamental of the physical sciences, graduate-level studies in the field provide essential knowledge for application in many areas. Students with strong backgrounds in physics, as well as in areas ranging from biology to engineering, are encouraged to consider a personalized MS program in physics. Graduates have many job opportunities in a variety of areas.

### Application Process

We welcome applications from students who have successfully completed a 4-year undergraduate degree in physics or closely related fields. International students who have gone through a 3-year undergraduate degree program need to have an MS degree to become eligible for admission.

Applications for admission for graduate study in physics have to be completed online. Your online application should include the following material (to be uploaded in electronic format):

- The results of the general GRE Test (required).
- The results of the GRE Advanced Physics Test, if available (not mandatory, but strongly recommended).
- For international applicants, the results of the TOEFL Test. The minimum total TOEFL scores for graduate admission into the MU Physics program are 550 (paper-based), 213 (computer-based) or 80 (internet-based). The IELTS test with a minimum score of 6.5 is an acceptable alternative to the TOEFL.
- A statement of purpose, in which you tell us a bit about yourself (e.g. your motivations, career goals, and research interests, and why you chose to apply at the University of Missouri).
- Three letters of recommendation.
- Your official transcripts.

Decisions on admission and financial support are usually made before April 15 on all complete applications received before March 15.

Information concerning the GRE (Graduate Record Examination) and the TOEFL (Test of English as a Foreign Language) may be obtained from the MU Graduate School's web site.

- MU institutional code for GRE and TOEFL: 6875
- GRE department code: 0808
- TOEFL department code: 76

### Admission Criteria

Fall deadline: March 15

Spring deadline: Rolling

Minimum GRE score: none set

Internet-based test (iBT)	Paper-based test (PBT)
80	550

### Required Application Materials

- University of Missouri Graduate School Application. Use the online application system to fill out the application form and upload the required documents.

- Official transcripts from all undergraduate and graduate institutions applicant has attended. Submit online to graduate school.
- Three letters of recommendation from three of your professors who are familiar with you and your work. Submit online to graduate school.
- A personal statement, containing a description of your research interests, academic background and plans of study. Submit online to graduate school.
- Official GRE score reports (the GRE physics subject test report is optional). Submit using institution code 6875 and department code 0808.
- International applicants: If your first language is not English, submit your official TOEFL scores using institution code 6875 and department code 76.

## Degree Completion Requirements

In general, students must present at least 30 credit hours for the MS degree, including at least 15 hours in courses at the 8000 level. The program must include at least 15 hours of physics courses. There is no foreign language requirement.

## Physical Science Option

The master of science (physical science) degree is designed for those preparing to teach more than one science or for those broadening their foundation in science before proceeding to the doctoral degree. It emphasizes broad training in physics, chemistry and mathematics. No thesis is required.

## Plan of Study

The MS Degree requires completion of a minimum of 30 course hours beyond the Bachelor's Degree (at least 15 hours of those in 8000 level courses) with a grade of 3.0 (B) or better, and completion of the Departmental Qualifying Examination at least at the MS pass level. The basic residency requirement stipulates that 24 hours of this work be courses taken at MU (i.e., no more than 6 hours may be transfer credits). In a normal program, this requirement is met by the end of the second year at MU. The required courses for a Master's Degree are:

PHYSICS 8610	Classical Mechanics	3
PHYSICS 8620	Electrodynamics I	3
PHYSICS 8660	Methods in Mathematical Physics	3
PHYSICS 8680	Thermodynamics and Statistical Mechanics	3
PHYSICS 8710	Quantum Mechanics I	3

Other additional courses may be taken from 7000 and 8000 level courses in astronomy, mathematics, chemistry, biology, engineering, and physics to make a total of 30 hours of course work. In some cases, a student who is a transfer graduate student or who has a particularly strong undergraduate background may have had course work which satisfies the requirement of one or more of these core courses. Exemption from taking these courses at MU may be granted upon written application to the Departmental Graduate Studies Committee.

## Research

It is essential for the MS degree that the students carries out some research. Three hours of research, PHYSICS 8090, should be taken, but not more than nine hours of reading and research courses may be included in the 30 hour requirement. (Note: This 9 hour limitation is a departmental requirement and is more restrictive than the Graduate School requirement.)

A formal MS thesis is not required in Physics. The student, in consultation with his/her advisor, can choose to write an MS thesis as an option (MU Graduate School thesis guidelines (<http://gradschool.missouri.edu/academics/thesis-dissertation/diss-thesis-guideline>)).

## Qualifying Examination

The student must pass the Departmental Qualifying Examination at least at the MS pass level. Upon completion of the qualifying examination, the student fills out the form M3, "Report of the Master's Examining Committee" and gathers the signatures of the Qualifying Examination Committee members. This form is then signed by the Director of Graduate Studies and forwarded to the Graduate School Dean. Graduation Requirements

After performing satisfactory work for the first year, the student with the advisor's assistance completes the form M1, "Plan of Study for the Master's Degree," an outline of the course of study for the student's graduate program, and forwards the application through the Departmental Graduate Studies Committee to the Dean of the Graduate School. The plan of study form must be filed no later than the session preceding the session in which the student expects to receive the degree. Upon approval of the M1 form by the Dean of the Graduate School, the student is a candidate for the degree.

The program for the Master's Degree must be completed within a period of eight years beginning with the first semester of enrollment, not including time spent in the armed services. For any extension of this time limitation, the student must petition the Graduate School Dean. Such petitions must be received in the Graduate School Office prior to the expiration of the normal period and must be approved by the advisor, the Departmental Director of Graduate Studies, and the Graduate School Dean. The Graduate School will notify the advisor in writing of the final decision.

The candidate must be enrolled at the MU campus during the semester in which the program of study, outlined in the "Plan of Study for the Master's Degree", is expected to be completed. During the first six weeks of this semester, the candidate must personally confirm with the Graduate School Office for all graduation arrangements.

## PhD in Physics

The doctor of philosophy degree is designed to educate scientists to be capable of independently formulating and solving problems of fundamental scientific importance. Detailed policies for the PhD degree are listed at the MU Graduate School. Here we give details specific to the Physics program.

## Application Process

Applications for admission for graduate study in physics have to be completed online. Your online application should include the following material (to be uploaded in electronic format):

- The results of the general GRE Test (required). MU institutional code for GRE: 6875 GRE department code: 0808
- The results of the GRE Advanced Physics Test, if available (not mandatory, but strongly recommended).
- For international applicants, the results of the TOEFL Test. A minimum test score of 80 is required. The IELTS test with a minimum score of 6.5 is an acceptable alternative to the TOEFL.
- A statement of purpose, in which you tell us a bit about yourself (e.g. your motivations, career goals, and research interests, and why you chose to apply at the University of Missouri).



- Three letters of recommendation.
- Your official transcripts.

Note: Decisions on admission and financial support are usually made before April 15 on all complete applications received before March 15.

## Admission Criteria

- Fall deadline: March 15
- Spring deadline: Rolling
- Minimum GRE score: none set

Minimum TOEFL scores (international applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
80	550

Note: MU institutional code for TOEFL: 6875. TOEFL department code: 76

## Required Application Materials

- University of Missouri Graduate School Application. Use the online application system ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) to fill out the application form and upload the required documents.
- Official transcripts from all undergraduate and graduate institutions applicant has attended. Submit online to graduate school.
- Three letters of recommendation from three of your professors who are familiar with you and your work. Submit online to graduate school.
- A personal statement, containing a description of your research interests, academic background and plans of study. Submit online to graduate school.
- Official GRE score reports (the GRE physics subject test report is optional). Submit using institution code 6875 and department code 0808.
- **International applicants:** If your first language is not English, submit your official TOEFL scores using institution code 6875 and department code 76.

## Degree Completion Requirements

A Ph.D. Degree requires completion of a minimum of 18 hours beyond the Master's Degree, with a grade of 3.0 (B) or better, and completion of the Department Qualifying Examination at the PhD pass level. The degree candidate must also meet the residency requirements. There is no foreign language requirement.

The required courses for a PhD Degree (in addition to those for the MS Degree in physics) are as follows:

- Physics 8640, Electrodynamics II (3 credit hours)
- Physics 8720, Quantum Mechanics II (3)
- Two graduate-level (>8000) courses in the student's area of specialization (6)
- A graduate-level (>8000) course in an area other than the student's area of specialization (3)

Additional graduate-level courses to make a total of 18 hours beyond the Master's Degree are required. See the graduate courses in Physics and Astronomy for electives. In addition, students can choose selected 7000 and 8000 level courses in Mathematics, Chemistry, Biology and Engineering.

A student is required to have taken a minimum of three full years of graduate work beyond the Bachelor's Degree. All acceptable graduate work, including one year's residence for a Master's Degree, is used to compute the three-year requirement for the PhD Degree. It is important to note that this is not a requirement for three calendar years of work, but rather a three-year's equivalent of full time study. When this three-year residency requirement is satisfied, a student should have finished a minimum of 72 credit hours of graduate work.

Within the three-year residence, each doctoral student must successfully complete at least two 12-hour semesters or three 8-hour semesters of graduate level program within a period of 18 calendar months. During this period, the student must be fully involved in academic pursuit, be it study, teaching, or research. This period of full-time reading, reflection, study, teaching, and research is considered necessary to give the student's program continuity and to fulfill the spirit and special demands of the doctoral program.

A student who is a graduate assistant, or who is engaged in other activities that reduce the time available for graduate study, may need more than the anticipated time to meet course and dissertation requirements. Nonetheless, a reasonable rate of progress is required. A PhD student must successfully complete the comprehensive examination within a period of five years beginning with the first semester of enrollment as a PhD student. In addition, the program for the doctoral degree must be completed within five years of passing the comprehensive examination.

For an extension of this time, the student must, before the expiration of the normal period, petition the Graduate School by submitting a request to the adviser who, in turn, submits a written recommendation to the Graduate School which has been endorsed by the departmental Director of Graduate Studies. An extension, if granted, may entail a revision of the candidate's program to update course work and research.

## Transfer of Credit

A student who has completed a master's degree at the University of Missouri-Columbia or elsewhere may, upon recommendation of the advisor and approval by the departmental Director of Graduate Studies and the Graduate School, transfer a maximum of 36 credit hours toward the total hours required for the doctoral degree. Transfer credit for doctoral students who do not have an earned master's degree is limited to a maximum of 12 hours of graduate credit.

## Degree Completion Requirements

In general, a PhD requires completion of a minimum of 18 hours beyond the master's degree, with a grade of 3.0 (B) or better, and completion of the department qualifying examination at the PhD pass level. The degree candidate must also meet the residency requirement. For more details, please consult the department's website or ask the director of graduate studies.

## Plan of Study

The doctoral program committee guides the student in planning a program of study. The Chair of the Doctoral Program Committee, after conferring with the student and the Doctoral Program Committee, submits to the Graduate School a report, including a copy of the proposed course of study and any request for transfer of graduate credit. This plan of study will, when completed,

- prepare the student for research in the chosen field of Physics or Astronomy,
- satisfy the credit-hour and residency requirements.

The student must substantially complete the course work outlined in the "Plan of Study for the Doctoral Degree" form (Form D2), to the satisfaction of the Doctoral Program Committee and the Dean before being considered for the Comprehensive Examination.

## Comprehensive Examination

To be an official candidate, the student must pass the Doctoral Comprehensive Examination, which is based upon graduate coursework in the Department (PHYSICS 8610, PHYSICS 8620, PHYSICS 8660, PHYSICS 8710, PHYSICS 8720, and other optional courses). The student must be enrolled to take this examination. It is to be administered only when MU is officially in session. The major advisor applies to the Dean for the Doctoral Program Committee to administer the Comprehensive Examination when the doctoral student has

- passed the Qualifying Examination,
- substantially completed the planned course work, and
- completed two years of the residence requirement.

The Comprehensive Examination is the most advanced general exam posed by MU. It may consist of both written and oral sections. It must be completed at least seven months before the final Dissertation Defense. The two sections of the examination must be completed within one month.

The written segment of the Comprehensive Examination is arranged and supervised by the major advisor. It consists of either (1) written questions prepared and graded by members of the Doctoral Program Committee, or (2) a research proposal on the work to be done for the PhD. Normally, the student will have two weeks to answer eight questions. Upon satisfactory completion of the written examination (or research proposal), the student is then given an oral examination by the committee.

For the Comprehensive Examination to be successfully completed, all or all but one of the committee, must vote to pass the student on the entire examination, both written and oral. A report of this examination, as in the "Doctoral Comprehensive Examination Results Form" (Form D3), carrying the signatures of all members of the committee, must be sent to the Graduate School and the student no later than two weeks after the completion of the examination.

A failure of either the written or oral section of the examination constitutes failure of the comprehensive examination. If a failure is reported, the committee will include in the report an outline of the general weaknesses of deficiencies of the student's work. The student and the committee will work together to identify steps the student might take to become fully prepared for the next examination. If at any time the student believes that the advice given by the committee is inadequate, the student may send a written request for clarification to the committee. A copy of this request should be sent to the Graduate School as well. The committee must respond to this request in writing within two weeks and a copy must be filed with the Graduate School. A student who fails may not take a second examination for 12 weeks. Failure to pass two Comprehensive Examinations automatically prevents candidacy.

## Doctoral Candidacy and Continuous Enrollment

Candidacy for a doctoral degree is established by passing the comprehensive examination. Status as a continuous enrollment doctoral student begins the term after the term in which the comprehensive exam was successfully completed. Candidacy is maintained by enrolling in PHYSICS 9090 research for two semester hours each fall and winter semester and for one semester hour each summer session up to and including the term in which the dissertation is defended. Continuous enrollment provides access to an adviser's support, doctoral program committee guidance and University research facilities for completion of the dissertation. Failure to continuously enroll in PHYSICS 9090 research until the doctoral degree is awarded terminates candidacy.

Candidacy may be reestablished by paying the registration and late fees owed and completing the requirements specified by the student's doctoral program committee. Registration fees owed may not exceed the amount owed for seven terms, regardless of the number of terms beyond seven for which the student failed to continuously enroll. The committee's requirements may include a second comprehensive examination of evidence of currency in the research field as suggested by publications in refereed journals. Candidacy is reestablished when the student's advisor and the departmental Director of Graduate Studies submit a written request to the Graduate School explaining the basis of the decision. Once approved, a Request to Re-enroll form must be completed by the student and sent to the department for processing.

## Dissertation and Defense

The dissertation must be written on a subject approved by the candidate's Doctoral Program Committee, must embody the results of original and significant investigation, and must be the candidate's own work. Candidates should consult the Graduate School's Theses and Dissertations Guidelines.

All dissertation defenses shall be open to all Physics and Astronomy faculty and graduate students. Dissertation defense dates should be publicly announced in advance. The candidate must be enrolled to defend the dissertation, which is administered when MU is officially in session. A report of the dissertation defense form (Form D4), carrying the signatures of all members of the committee, is sent to the Graduate School before the deadline preceding the anticipated date of graduation. For the dissertation to be successfully defended, the student's doctoral committee must vote to pass the student on the defense with no more than one dissenting or abstaining vote.

## Graduate Certificate in Teaching High School Physics

Through this project, participants gain an expanded range of leadership expertise, content knowledge and pedagogical proficiency to share with others, as they become resources and catalysts for reform in science education at the secondary and post-secondary institutional levels. Ultimately, the overall goal is a significant increase in student achievement in science and science coursework.

For more information please visit the A TIME for Physics First website: <http://www.physicsfirstmo.org/#> or contact the Department of Physics by calling 573-882-7997 or emailing [hillsar@missouri.edu](mailto:hillsar@missouri.edu)

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## Political Science

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A. Cooper Drury, Chair  
College of Arts and Science  
113 Professional Building  
(573) 882-2843  
drury@missouri.edu

Political science is concerned with government, politics and public policies. In political science courses, students learn how government operates and how to analyze and evaluate public policies and political ideas. This training can help students be more effective as active citizens, as political leaders and as government administrators.

Many political science graduates attend law school or graduate school in political science, public administration, business administration, the social sciences, and other subjects. Others are employed in governmental or political jobs as legislative assistants, military officers or lobbyists, and more go into business or private employment. Many public officials and government administrators have political science degrees.

Courses in political science help students learn to think critically, analyze complex material and communicate effectively. Political science classes require extensive writing assignments, and majors are given many opportunities to hone their writing skills.

The department offers BA, MA and PhD degrees with majors in Political Science.

### Faculty

**Professor** M. E. Arce\*\*, J. K. Dow\*\*, A. C. Drury\*\*, L. M. Overby\*\*, J. R. Petrocik\*\*, P. Squire\*\*

**Associate Professor** J. W. Endersby\*\*, L. R. Keiser\*\*, J. T. Kriekhaus\*\*, S. L. Quackenbush\*\*

**Assistant Professor** S. S. Dietrich\*, J. B. Dyer\*\*, S. C. Greitens, M. D. Minta\*\*, A. M. Murdie\*\*, L. K. Williams\*\*

**Associate Teaching Professor** W. T. Horner

**Adjunct Professor** J. D. Milyo\*, M. A. Stegmaier\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 260)
- BA in Political Science (p. 260)
- Minor in Political Science (p. 261)

### Internships

The Political Science Department offers internship course credit for work in a variety of governmental settings, including work with state legislators, administrative agencies, lobbyists, members of Congress, statewide elected officials, and state political parties. Seniors in good standing with a GPA of 2.67 and juniors in good standing with a GPA of 3.0 who have completed appropriate coursework are eligible to apply. No more than 3

internship credit hours may be included in the 30 hours required for the major.

### Graduate

College of Arts and Science  
113 Professional Building  
573-882-2062  
<http://politicalscience.missouri.edu/>

**Director of Graduate Studies:** James Endersby

- MA in Political Science (p. 261)
- PhD in Political Science (p. 262)

The department emphasizes both quality teaching and research. Several faculty members have received awards and prizes for teaching excellence and innovative research. The department aims to train people as experts in the study of politics and government, while encouraging students to acquire a sufficient background in other disciplines to enable them to correlate their specialized knowledge with all aspects of modern life.

### Careers

The MA can serve multiple career goals: community-college teaching, continuation of studies to the PhD, entrance into and advancement in public service, or acquisition of skills for a position in the private sector.

Alumni with PhDs have received teaching appointments at public and private colleges as well as positions of responsibility in state and national government in the United States and in many foreign countries. In recent years, an average of five students a year entered the PhD job market. Approximately eighty percent of the PhD graduates became college teachers. Most of the remainder went into public service and a few into the private sector. Six departmental alumni have become college presidents.

### Financial Aid from the Program

Applications for admission and financial aid are considered on the basis of the entire packet submitted. Students may apply for departmental teaching and research assistantships and fellowships, as well as university scholarships and fellowships. Annually, about 20 departmental assistantships offer stipends of over \$11,500 plus waivers of educational fees. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Satisfactory Progress

A graduate student must maintain a minimum 3.0 GPA after the first semester of graduate study and a 3.4 cumulative GPA in all subsequent semesters. A student should complete and pass required courses, activities, and examinations on schedule. The student's adviser and the director of graduate studies will monitor and provide an annual assessment of a student's progress. Failure to maintain satisfactory progress can have serious consequences, including dismissal from the program.

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## Undergraduate

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## Department Level Requirements - Political Science

Students complete a graduation plan, usually at the end of the sophomore year or beginning of the junior year. They should prepare for political science courses by completing university and College of Arts and Science foundation requirements, including university general education.

Students must complete the following classes with letter grades in the C range or better to file a graduation plan:

- POL\_SC 1100 or an equivalent course
- ENGLSH 1000 or an equivalent course
- MATH 1100 followed by a mathematics or statistics course (STAT 1200 will not count)
- An analytical course e.g. SOCIOL 1000, PSYCH 1000, ECONOM 1014, PHIL 1000 or PHIL 1200
- POL\_SC 3000

Students are required to complete 30 credits in political science. Fifteen of the 30 must be numbered 4000 or above.

### Departmental Honors

Students who have honors eligibility and a 3.5 GPA may enter the departmental honors program. Students who successfully complete a senior honors paper with a letter grade in the "B" range or better will have the phrase "with Honors in Political Science" added to their diplomas. Each year many political science honors students are selected for Phi Beta Kappa, Mortar Board, Golden Key and other scholastic honoraries.

Students who plan to enter graduate school are encouraged to enter the departmental honors program and to speak with a faculty member early in their academic career. Some areas of graduate study require significant preparation in language, statistics and methodology.

## BA in Political Science

### Major Program Requirements

Students must complete the University of Missouri's general education requirements and the Department Level Requirements (p. 260), in addition to the degree requirements below.

All majors must take:

POL\_SC 1100 American Government

POL\_SC 3000 Introduction to Political Research \*

\*POL SC 3000 should be taken as a sophomore. It introduces majors to the systematic study of political phenomenon and prepares students for upper-class courses. A grade of C- or higher is required.

Comparative government (at least one course required)

POL\_SC 2600 Canadian Politics and Government

POL\_SC 2700 Comparative Political Systems

POL\_SC 2720 European Democracies

POL\_SC 4500 The European Union in the Global System

POL\_SC 4600 Latin American Politics

POL\_SC 4605 Latin American Politics through Film

POL\_SC 4610 European Political Systems

POL\_SC 4670 The Political System of the European Union

POL\_SC 4720 Politics of Development

POL\_SC 4730 Women and Politics

POL\_SC 4750 Power and Money

POL\_SC 4760 Comparative Political Parties

POL\_SC 4770 Comparative Political Behavior

International affairs (at least one course required)

POL\_SC 1400 International Relations

POL\_SC 4400 Theories of International Relations

POL\_SC 4410 Politics and War

POL\_SC 4411 Genocide, Terrorism and Civil War

POL\_SC 4412 Strategy and Warfare

POL\_SC 4420 Politics of International Economic Relations

POL\_SC 4440 International Organization

POL\_SC 4540 American Foreign Policies

Political theory/methodology (one course highly recommended, but not required)

POL\_SC 2800 Introduction to Political Theory

POL\_SC 2860 American Political Thought

POL\_SC 4000 Introductory Statistics for Political Science

POL\_SC 4010 Computing Methods

POL\_SC 4030 Formal Political Analysis

POL\_SC 4800 Classical Political Theory

POL\_SC 4830 Democracy in America (and Elsewhere)

American politics/public policy (at least two courses required)

POL\_SC 2100 State Government

POL\_SC 2200 The Judicial Process

POL\_SC 4100 Political Parties and Election Campaigns

POL\_SC 4110 Political Behavior

POL\_SC 4120 Politics and the Media

POL\_SC 4130 African-American Politics

POL\_SC 4140 Congress and Legislative Policy

POL\_SC 4150 The American Presidency

POL\_SC 4160 Interest Groups

POL\_SC 4170 Politics of the American South

POL\_SC 4200 The American Constitution

POL\_SC 4210 Constitutional Rights

POL\_SC 4230 Constitution and Civil Liberties

POL\_SC 4310 Comparative State Politics

POL\_SC 4320 Public Policy

POL\_SC 4370 Issues in Public Bureaucracy

POL\_SC 4380 Politics of Criminal Justice

### Options

For students who want to concentrate on a specific area, suggestions for a course of study are available from the academic advisor. These include:

- Government service for students who want to become government administrators
- Public information and reporting for students who plan to be governmental press secretaries, public information specialists, interest group lobbyists or government reporters
- International relations for students who want to work for multinational corporations or international agencies

- Graduate school preparation
- Law school preparation

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000*	3	MATH 1100	3
Foreign Language 1100*	5	Foreign Language 1200*	5
Behavioral Science*	3	Behavioral Science*	3
POL_SC 1100**^	3	Political Science^	3
Elective	1	Elective	1
	15		15
Second Year			
Fall	Credits	Spring	Credits
Foreign Language 2100*	3	Elective	3
Math/Stat class**	3	Humanities	3
Social Science*	3	Social Science*	3
Social Science*	3	Biological Science*	3
POL_SC 3000 (WI)^	3	Political Science^	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
Political Science^	3	Political Science^	3
Humanities*	3	Humanities*	3
Physical Science (lab)*	3	Humanities*	3
Elective	3	Elective (WI)	3
Elective	3	Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
POL_SC 4995**^	3	Political Science^	3
POL_SC**	3	Political Science^	3
Elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
	15		15
Total Credits: 120			

^ Course meets degree program requirements

\* Course meets University general education and/or campus graduation requirements

## Minor in Political Science

To earn a minor in political science, students must complete 15 credits, including the following:

- POL\_SC 1100, American Government (3) or an equivalent course
- Additional political science courses totaling 12 credits with at least 6 at the 4000 level
- No more than 3 internship credits may be included and will not count as a 4000 level
- Nine credits must be in residence including 6 at the 4000 level
- A grade of C- or better is required of all political science classes in either a minor or a major with an overall GPA of 2.0 or greater.

## Graduate

### MA in Political Science

#### Admission Contact Information

Audra Jenkins  
 113 Professional Bldg  
 Columbia, MO 65211  
 573-882-2062

#### Admission Criteria

Admission into the PhD program is determined by the graduate committee's consideration of the applicant's performance on the applicant's academic record, personal statement, letters of recommendation, and the GRE general test.

Fall deadline: February 1  
 Spring deadline: October 1

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
89	570

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1000
On or After August 1, 2011	300

- Minimum GPA: 3.0 overall, in last 60 hours, and in political science courses.
- 12 hours of upper-division course work in political science is recommended.
- An undergraduate major in an area other than political science may be acceptable.

#### Required Application Materials

- Graduate School online application form
- one to two page statement of purpose, describing interests and goals in graduate study in Political Science
- three letters of recommendation
- official transcripts from all universities attended
- official results from the Graduate Record Examination (GRE)

- writing sample
- Test of English as a Foreign Language (TOEFL) scores (for International students)

## MA Degree Completion Requirements

All MA students must complete POL\_SC 7000, POL\_SC 7010, and POL\_SC 9030. Each candidate must take one graduate seminar (8000 level) in each of three fields. Fields include: American political institutions and behavior, comparative politics and government, international relations, and public policy and administration.

The master's degree program culminates in a comprehensive oral examination and defense of the research project. The Master of Arts degree may be earned by completing either the thesis or the non-thesis program.

### Thesis Option

Students wishing to advance from the master's program to the PhD program at MU must take the thesis option. The thesis program requires 30 hours of academic credit (at least 18 in 8000-level Political Science seminars) and an acceptable thesis for which up to six semester hours of credit must be earned (POL\_SC 8090).

### Non-Thesis Option

The non-thesis program is a 30-hour generalist master of arts. It requires a student to take at least 30 hours of academic credit (at least 18 in 8000-level Political Science seminars) and to write a master's paper for which up to three hours of credit must be earned (POL\_SC 8085).

### Satisfactory Progress

A master's student should maintain a minimum 3.0 GPA after the first semester and a 3.4 cumulative GPA in subsequent semesters. The MA program must be completed within five years of the first semester of enrollment. Most students complete the master's program within two years.

## PhD in Political Science

### Admission Contact Information

Audra Jenkins  
113 Professional Bldg  
Columbia, MO 65211  
573-882-2062

### Admission

Admission into the PhD program is determined by the graduate studies committee's consideration of the applicant's performance on the applicant's academic record, personal statement, letters of recommendation, and the GRE general test.

### Admission Criteria

Fall deadline: February 1  
Spring deadline: October 1

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
89	570

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1200
On or After August 1, 2011	320

- Minimum GPA: 3.0 overall, in last 60 hours, and in political science courses
- 12 hours of upper-division course work in political science is recommended.

### Required Application Materials

- Graduate School online application form
- one to two page statement of purpose, describing interests and goals in graduate study in Political Science
- three letters of recommendation
- official transcripts from all universities attended
- official results from the Graduate Record Examination (GRE)
- writing sample
- Test of English as a Foreign Language (TOEFL) scores (for International students)

### PhD Degree Completion Requirements

A student's doctoral program must include at least 52 hours of graduate work, exclusive of dissertation research. At the option of the student's doctoral program committee, up to 24 hours of the MA program may be included in the PhD program.

### Plan of Study

A student's program shall include at least 40 hours in Political Science courses and at least 40 hours in graduate seminars (8000 and above). Students choose a primary and secondary field from the four doctoral fields: American political institutions and behavior, comparative politics and government, international relations, and public policy and administration.

Graduate courses must include:

- A minimum of 12 seminar hours in the primary (research) field
- A minimum of nine seminar hours in a secondary field supporting the primary field
- A minimum of 13 hours in a methodology or research tool field. Required courses include POL\_SC 7000, POL\_SC 7010, and POL\_SC 9030.
- The remaining six hours in the methodology field may be in advanced formal or quantitative methods, advanced foreign language, or a combination of the two.
- A minimum of six hours in an outside field. These courses may be in a cognate field in support of relevant substantive fields or research methods related to dissertation research.

Besides completing the necessary course work, the candidate must demonstrate the capacity to use a research tool (such as a foreign language or statistics), should obtain some teaching experience in political science (for academic careers), must pass separately written and oral comprehensive examinations, must submit and defend a dissertation proposal, and must submit and defend a dissertation.

### Length of Study

All required courses and the comprehensive examination must be completed within five years of the first semester in the graduate program.

The dissertation must be completed and defended within five years of passing the comprehensive examination.

The PhD usually requires five years full time or the equivalent in part-time work beyond the bachelor's degree and four years beyond the master's degree. Full-time students (including teaching and research assistants) must carry a minimum of nine-hours of courses per semester (except for students conducting dissertation research).

## **Timeline**

The first three years of doctoral study typically include course work and preparation for the comprehensive examinations. Comps (POL\_SC 9970) are typically taken early in the fourth year. A proposal for dissertation research is defended within a few months of the comprehensive exams. The remaining time is devoted to dissertation research (POL\_SC 9090).

## **Satisfactory Progress**

A doctoral student should maintain a minimum 3.0 GPA after the first semester and a 3.4 cumulative GPA in subsequent semesters. Comprehensive exams and dissertation proposal must be completed within a timely fashion. The PhD program must be completed within ten years of the first semester of enrollment. Most students complete the doctoral program within five years.

## Psychology

Dr. Moshe Naveh-Benjamin  
College of Arts and Science  
210 McAlester Hall  
(573) 882-6860  
<http://psychology.missouri.edu>

The faculty and staff of the Department of Psychological Sciences are committed to providing students with a high quality, broadly-based undergraduate education. Understanding that undergraduate students use the psychology major as preparation for a variety of postbaccalaureate experiences, the department is dedicated to offering a wide range of courses and services to students. While some students are interested in pursuing psychology-related interests in graduate school, most are interested in pursuing careers after graduating with a Bachelor of Arts (BA).

Regardless of a student's ultimate goals, faculty members believe that students will be best served by completing a rigorous research-oriented program of study. Therefore, students should expect instructors to take a scientific approach to the psychological content of each course.

The department offers BA, MA, and PhD degrees with a major in Psychology. A minor is also available.

## Faculty

**Professor** J. Arndt\*\*, B. Bartholow\*\*, D. Bell\*\*, A. Bettencourt\*\*, C. Borduin\*\*, L. Cooper\*\*, N. Cowan\*\*, S. Frey\*\*, D. Geary\*\*, L. King\*\*, M. Naveh-Benjamin\*, T. Piasecki\*\*, A. Rose\*\*, J. Rouder\*\*, T. Schachtman\*\*, K. Sheldon\*\*, K. Sher\*\*, W. Slutske\*\*, D. Steinley\*\*, T. Trull\*\*, P. Wood\*\*

**Associate Professor** S. Christ\*\*, S. Hackley\*\*, K. Hawley\*\*, J. Kerns\*\*, Y. Luo\*\*, D. McCarthy\*\*, D. Miller\*\*, M. Stadler, M. Will\*\*

**Assistant Professor** N. Campione-Barr\*\*, C. Davis-Stober\*\*, I. Gizer\*\*, J. Johnson\*\*, E. Merkle\*\*, L. Scherer\*\*, V. Shaffer\*\*, C. Stober, K. vanMarle\*\*

**Research Assistant Professor** J. Bohanek

**Clinical Professor** N. Presser

**Clinical Associate Professor** M. Klein-Trull, J. Skinner

**Teaching Professor** A. Strathman\*\*

**Assistant Teaching Professor** L. Bauer, J. Ludlam, E. Naveh-Benjamin, I. Segert, M. Skaggs Sheldon

**Professor Emeritus** W. Anderson, B. Biddle, R. Geen, J. LoPiccolo, M. Thelen, D. Wright

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 266)
- BA in Psychology (p. 266)
- Minor in Psychology (p. 267)

## Graduate

College of Arts and Science  
210 McAlester Hall  
573-882-0838  
FAX 573-882-7710  
<http://psychology.missouri.edu/grad>

**Director of Graduate Studies:** Alan Strathman

- MA in Psychology (p. 267)
- PhD in Psychology (p. 268)

## About Psychological Sciences' Degrees

The Department of Psychological Sciences offers a PhD degree with emphases in Clinical Psychology, Cognition and Neuroscience, Developmental Psychology, Quantitative Psychology, and Social/Personality Psychology. The department also offers a dual emphasis area program in Child Clinical and Developmental Psychology. All emphasis areas offer broad empirical and theoretical training with a research emphasis.

The Clinical Psychology emphasis area is accredited by the American Psychological Association and by the Psychological Clinical Science Accreditation System, and is a member of the Academy of Psychological Clinical Science.

**Note:** Most students accepted have an undergraduate major in psychology or its equivalent. Acceptance is based on training, quality of work, recommendations, GRE scores and other information. For additional information on admission requirements, consult Graduate Study in Psychology and Associated Fields, published annually by the American Psychological Association and available in most libraries.

## Description of Emphasis Areas

### Clinical Psychology Emphasis

The Clinical Psychology program is accredited by the American Psychological Association and by the Psychological Clinical Science Accreditation System, and is a member of the Academy of Psychological Clinical Science. The Clinical program follows a clinical science model of training. Central to this model is a commitment to:

1. using an empirical approach to understanding, ameliorating, and preventing human problems in behavior, affect, cognition, and health;
2. to promoting adaptive human functioning; and
3. to disseminating and applying knowledge in ways consistent with scientific evidence.

The Clinical program prepares students for careers involving support, production, and dissemination of clinical science research. Clinical faculty and students are active in research and scholarship that advances understanding of the symptoms, causes, course, treatment, and prevention of many of our nation's most distressing and impairing mental/behavioral health issues (e.g., addictions, anxiety, developmental disorders, eating disorders, juvenile delinquency, mood instability and disorders, schizophrenia). Students work primarily with core clinical faculty, but may also collaborate with researchers throughout the department and in other campus and community units (e.g., Thompson Center for Autism and Developmental Disabilities, Fulton State Hospital).

Students also develop clinical skills in empirically supported approaches to assessment, prevention and intervention. The Clinical program



maintains its own community-based outpatient clinic (the Psychological Services Clinic or PSC) as a practicum training site for students in the clinical program. The PSC is staffed by doctoral-level clinical psychologists and clinical graduate students, and it serves a broad range of clients through individual, couple, family, and group assessment and therapy services. Additional clinical experiences are available through paid or volunteer positions at institutions such as Fulton State Hospital, University Hospitals and Clinics, the Thompson Center, and the Boone County Juvenile Office's Multisystemic Family Therapy Program.

After completing high quality internships, typically at medical centers, VAs, or university research centers, graduates are employed in positions that involve research, teaching and service in universities, medical centers, clinics, hospitals and similar agencies.

## Cognition and Neuroscience Emphasis

Cognition and neuroscience training provides students with a thorough background in the content areas of psychology, statistics and scientific methodology, through course work and, more importantly, through participation in ongoing research. Students are expected to be actively engaged in research throughout their graduate training.

Faculty in cognition and neuroscience investigate a variety of topics in cognitive psychology, electrophysiology, and neuroimaging including selective attention, motor processing; memory; brainstem reflexes; blindsight; brain correlates of true and false memories; language; neuropharmacology and drug abuse; Parkinson's disease and many other topics.

Within cognitive psychology, our researchers investigate human learning in auditory and speech perception; immediate memory and attention; skill acquisition; individual differences in human memory and intelligence; numerical cognition; implicit learning and memory; false memory; human covariation judgment. Developmental work is being done on memory and aging; intellectual development in adulthood and memory for speech in children. Animal learning studies investigate memory retrieval processes in animals; extinction; the role of context in conditioning; and drug effects.

## Developmental Psychology Emphasis

Developmental psychology is the scientific study of social, cognitive, and physical development over time. The Developmental Psychology doctoral program offers a strong background in statistics and research methodology and intensive research mentoring. Graduate students engage in research with their primary advisor beginning in their first semester in the program and take supporting coursework.

## Quantitative Psychology Emphasis

The goal of the PhD program with emphasis in quantitative psychology is to produce researchers who are able to develop, evaluate, and apply advanced methodological techniques to psychological research questions. The program offers considerable diversity in faculty research and coursework offerings; our substantive interests span clinical, social, health, developmental, and cognitive psychology. Quantitative areas of expertise cover a range of linear and non-linear approaches to modeling, as well as meta-analysis, time series, state-space models, and issues in large-scale data management.

Students in quantitative psychology complete course work in mathematical statistics, experimental design, and measurement, as well as courses in quantitative methods. Students can acquire extensive experience as statistical consultants through specific coursework in statistical consultation. Program requirements are fairly flexible, and

students with particular interests in a substantive area of psychology are encouraged to take advanced courses in that area. Quantitative course offerings focus both on classic analytic methods as well as advanced techniques such as structural equation modeling, multilevel modeling, and meta-analysis.

Strong ties exist between the Department of Psychological Sciences and the Department of Statistics, and students may opt to complete a master's degree in statistics as they progress through the PhD program. In addition, students have the opportunity to gain experience as statistical consultants through specific coursework in this area.

On-going projects conducted by the faculty include research in meta-analytic and secondary analysis techniques, structural equation modeling, particularly as applied to longitudinal models of change and growth, multilevel modeling, and mathematical and statistical models of cognition and perception.

## Social/Personality Psychology Emphasis

Social/Personality psychology offers training in the traditional areas of social and personality psychology, as well as their relevance for several applied areas including health psychology. This Social/Personality area integrates the psychology of the person and the situation, with the goal of understanding the psychological processes that underlie people's emotions, motivations, beliefs, and actions.

Training focuses on the multi-faceted view of social behavior from three levels:

1. the individual level;
2. the contextual level (or social level); and
3. the interaction of the individual and the contextual levels.

All three levels are vital to fully understanding human psychology. Particular research foci in the area include the sources of motivation, both individual and social; the nature of meaning-making, both existential and interpersonal; the determinants of optimal and destructive functioning, both within and between groups and in relationships; and the causes and consequences of psychological well-being, growth, and defense.

From the first year, students will be actively involved in their advisor's ongoing research program. The exact nature of this involvement will be determined by the interests and needs of both parties, and may entail attending research meetings, designing research studies, running subjects, analyzing data and/or writing research reports. This hands-on research experience in conjunction with completing coursework and other program requirements is intended to provide the student with a firm grounding in the theory and methods of social/personality psychology, as well as the skills to conduct and publish his or her own research.

## Dual Emphases: Child Clinical and Developmental Psychology

Students in the Dual Emphasis Program pursue a graduate degree with training in both clinical (child track) and developmental psychology. Students in this program are involved in training that bridges the two areas of developmental psychology and child-clinical psychology. This program provides training in the area of developmental psychopathology with the added benefit of training in the practice of child-clinical psychology. To pursue the joint program, students must be officially admitted into both the clinical and developmental training areas within the Department of Psychological Sciences and complete requirements for both areas.

## More Information about Emphasis Areas

These programs and others are more fully described at the departmental website at <http://psychology.missouri.edu>.

## Undergraduate

### Department Level Requirements - Psychology

There are no requirements at the department level for this degree. Please see the BA in Psychology (p. 266) page for degree requirements.

### BA in Psychology

#### Major Program Requirements - Psychology

To graduate with a Bachelor of Arts with a major in Psychology in the College of Arts and Science, a student must complete all degree, college and university graduation requirements, including university general education (p. 18) as well as all degree and college or school requirements. Students are reminded to check the Undergraduate Catalog for course descriptions and prerequisite information.

#### Major Core Requirements

- The psychology major requires 30 credits.
- All courses that count toward the psychology major requirements must be completed with a grade of C or better. Grades of C- or below will not be accepted. This includes or its equivalent (a required course for all psychology majors).
- Students must complete at least two psychology courses numbered 4000 or above.
- Students must complete at least one psychology course numbered 3000 or above that is designated Writing Intensive. The psychology capstone lab will meet the WI requirement if completed during the fall or spring semesters. Capstones are not WI in the summer sessions.
- No more than 43 credits in psychology can count toward the credits needed for graduation. Students who take the two-semester honors capstone may have no more than 46 credits in psychology.
- Students may use no more than 9 hours of Special Problems Courses (PSYCH 2950, PSYCH 4950 & PSYCH 4960) toward graduation.

#### Required courses

PSYCH 1000	General Psychology	3
STAT 1200	Introductory Statistical Reasoning	3
Research methods sequence		
PSYCH 3010	Research Methods in Psychology I	3
PSYCH 3020	Research Methods in Psychology II	3
Capstone course (psychology lab course)		3-6

#### Distribution Areas

Psychology majors are required to take one course from four of the five distribution areas. This ensures that students will have exposure to a wide range of psychological theory and research. In addition, students choose two more Psychology courses to receive additional education

according to their interests. Although the distribution areas are presented below as distinct areas of study, a great deal of overlap exists among them. Students should understand the ways in which the various areas complement one another and gain the ability to integrate information learned in the different areas.

#### Learning and Cognition

This distribution area studies the mechanisms of the mind and how they are altered by experience. Courses in this distribution area include:

PSYCH 2110	Learning, Memory, and Cognition	3
PSYCH 2820	Introduction to Cognitive Science	3
PSYCH 3110	Theories of Learning	3
PSYCH 3130	Decisions, Values and Choice	3
PSYCH 3140	Cognitive Psychology	3
PSYCH 3150	Human Memory	3
PSYCH 3160	Perception and Thought	3

#### Biological/Neuroscience

This distribution area studies the biological basis of the behavior of humans and other animals. Courses in this distribution area include:

PSYCH 2210	Mind, Brain, and Behavior	3
PSYCH 2220	Drugs and Behavior	3
PSYCH 2810	Human Sexuality	3
PSYCH 3830	Health Psychology	3
PSYCH 4210	Physiological Psychology	3
PSYCH 4220	Animal Learning and Behavior	3
PSYCH 4240	Cognitive Neuroscience	3

Note: A student may not receive credit for PSYCH 2210 if it is taken after PSYCH 4210.

#### Social/Personality

This distribution area employs scientific methods to understand the nature and causes of individuals' thoughts, feelings and behavior in social situations. Courses in this distribution area include:

PSYCH 2310	Social Psychology	3
PSYCH 2320	Introduction to Personality	3
PSYCH 3310	Intergroup Relations	3
PSYCH 4340	Attitude Change	3
PSYCH 4350	Stereotypes and Prejudice	3
PSYCH 4815	Cross-Cultural Psychology	3

#### Developmental

This distribution area studies the cultural and biological influences on age-related changes in cognition, emotion and social behavior that take place throughout an individual's lifespan. Courses in this distribution area include:

PSYCH 2410	Developmental Psychology	3
PSYCH 3410	Infancy	3
PSYCH 3420	Cognitive Development in Childhood	3
PSYCH 3430	Social Development in Childhood	3
PSYCH 4440	Sex Differences	3

Note: Due to the overlap in course content, a student may receive credit for only one of the following three courses: PSYCH 2410, H\_D\_FS 3420 or ESC\_PS 2500.

## Clinical/Abnormal

This distribution area focuses on scientific study of the causes of mental disorders as well as methods for assessing and alleviating mental health problems and related types of maladjustment. It also is concerned with the study of mental health and wellness, including strategies for preventing the development of mental disorders. Courses in this area include:

PSYCH 2510	Survey of Abnormal Psychology	3
PSYCH 2830	Human-Companion Animal Interaction	3
PSYCH 3510	Introduction to Clinical Psychology	3
PSYCH 4520	Behavior Genetics (Prerequisite of Psych 3020 with a grade of C or better)	3
PSYCH 4530	Research in Psychopathology	3
PSYCH 4540	Emotional Disorders in Childhood and Adolescence	3
PSYCH 4560	Schizophrenia	3
PSYCH 4570	Pediatric Neuropsychology	3

## Psychology Electives (2000-level) 6

Students must complete two psychology elective courses numbered 2000 or above, excluding Special Problems/Readings, Internship, and Capstone Labs.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
PSYCH 1000 <sup>^</sup>	3	Psych Social/Personality Course <sup>^</sup>	3
ENGLISH 1000 <sup>++</sup>	3	MATH 1100 <sup>++</sup>	3
Behavioral Science Course <sup>+</sup>	3	Social Science Course <sup>+</sup>	3
AGH: Social Science Course <sup>++</sup>	3	Humanities (2000+ Arts and Science approved) <sup>+</sup>	3
Humanities Course <sup>+</sup>	3	1000+ elective	3
	15		15
Second Year			
Fall	Credits	Spring	Credits
Psych Developmental Course <sup>^</sup>	3	Psych Clinical/Abnormal Course <sup>^</sup>	3
Foreign Language 1 <sup>++</sup>	5	Foreign Language 2 <sup>++</sup>	5
Biological/Physical Science Course <sup>+</sup>	3	Psych 2000+ elective <sup>^</sup>	3
1000+ elective	3	1000+ elective	3
1000+ elective	1	1000+ elective	1
	15		15

Third Year			
Fall	Credits	Spring	Credits
PSYCH 3010 <sup>^</sup>	3	PSYCH 3020 <sup>^</sup>	3
Psych Biological/Neuroscience Course <sup>^</sup>	3	Biological/Physical Science Course (with LAB) <sup>+</sup>	3
Foreign Language 3 <sup>++</sup>	3	Social Science (2000+ Arts and Science approved) <sup>+</sup>	3
STAT 1200 <sup>^++</sup>	3	1000+ elective	3
1000+ elective (Writing Intensive) <sup>+</sup>	3	3000+ elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
Psych Capstone (Writing Intensive) <sup>^++</sup>	3	Psych 4000+ elective <sup>^</sup>	3
Behavioral Science Course (2000+ Arts and Science approved) <sup>+</sup>	3	Humanities Course <sup>+</sup>	3
Humanities Course <sup>+</sup>	3	3000+ elective	3
3000+ elective	3	3000+ elective	3
3000+ elective	3	3000+ elective	3
	15		15
Total Credits: 120			

<sup>^</sup> Course meets degree program requirements

<sup>\*</sup> Course meets University general education and/or campus graduation requirements

<sup>+</sup> Course meets College of Arts and Science foundation (Basic Skills)

## Minor in Psychology

The psychology minor requires 15 credits, distributed as shown below.

PSYCH 1000	General Psychology	3
Four regularly-scheduled psychology courses		12

At least two of these courses must be numbered 3000 or above. "Regularly-scheduled" includes all courses except special problems courses, which are PSYCH 4950 and PSYCH 4960: Readings.

Total Credits	15
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Students must receive a grade of C or better in all courses required for the minor. Grades of C- will not be accepted.

Only 6 credits in transfer courses will be accepted toward the minor.

## Graduate

### MA in Psychology

At this time, our Department is not admitting students who are seeking a terminal master's degree. However, our doctoral students earn an MA degree en route to the PhD.

**Please see the admission criteria for our doctoral degree program.**

Admission Contact Information

Graduate Student Services  
 gradpsych@missouri.edu  
 210 McAlester Hall  
 Columbia, MO 65211  
 573-882-0838  
 573-882-7710 (fax)

## PhD in Psychology

Admission Contact Information  
 Graduate Student Services  
 gradpsych@missouri.edu  
 210 McAlester Hall  
 Columbia, MO 65211  
 573-882-0838  
 573-882-7710 (fax)

### Admission Criteria

Fall deadline: December 1

- Minimum GPA: 3.0
- Minimum GRE score: no minimum, subject test is strongly recommended
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

An interview is required for admission to the clinical psychology program. Students earn an MA en route to the PhD, but we do not admit students seeking a terminal master's degree.

Most students accepted have an undergraduate major in psychology or its equivalent. Acceptance is based on training, quality of work, recommendations, GRE scores and other information. For additional information on admission requirements, consult Graduate Study in Psychology and Associated Fields, published annually by the American Psychological Association and available in most libraries.

### Required Application Materials

Note: *Submit all application materials directly to the Graduate School*

- Graduate School online application including:
- Department application (available at department website)
- Personal statement
- Three letters of recommendation
- One official copy of each college transcript where a degree was earned or is pending
- Official GRE score report (subject test report recommended)
- Official TOEFL score (if applicable)

### PhD Degree Completion Requirements

The PhD qualifying examination requirement is satisfied by successful completion of the MA degree. A master's degree with an empirical thesis is required for doctoral study. The master's with thesis is typically completed as part of a student's normal progress through the doctoral program.

### Students with Degrees from Other Universities

Students who enter the doctoral program with a master's (thesis) degree from another university can satisfy the MA requirement at this university by having their thesis and course work approved by a three-member thesis committee. The committee must be composed of one faculty member from the student's training area, one faculty member from another training area, and one MU faculty member from outside the department. Those entering the department with a master's degree obtained without an empirical thesis may meet this requirement by conducting an investigation under the supervision of their adviser and having the resulting thesis approved by a three-member committee with the composition identified above.

### Plan of Study

General requirements for the PhD include nine hours of distribution courses, 11 hours in statistics, 24 hours in the area of concentration, other elective courses, and research. Students must earn 83 hours to graduate with the PhD. Practica, internship and additional course work are required for the clinical program. Other requirements include a dissertation and comprehensive and final oral examinations. More detailed information about the rules and regulations for degree completion can be found in the Department of Psychological Sciences Graduate Student Handbook.

### Financial Aid from the Program

Financial aid is available through departmental research and teaching assistantships and from university fellowships.

## Religious Studies

Richard Callahan, Chair  
 College of Arts and Science  
 221 A&S Building  
 (573) 882-4769  
 rsinfo@missouri.edu  
<http://ReligiousStudies.missouri.edu>

### Faculty

**Associate Professors** R. J. Callahan\*, S. M. Cohen\*  
**Assistant Professors** E. Drott\*, C. Duncan\*, R. Gregory\*, N. Hofer\*, D. Kelley\*  
**Teaching Assistant Professors** D. Cohen\*, J. Flanagan\*

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 269)
- BA in Religious Studies (p. 269)
- Minor in Religious Studies (p. 270)

The department's field of study includes religious expressions from many cultures and in every period of history. Systematic study of this rich world of expression employs the widest range of academic tools and competencies, from the skills of the literary critic and historian to the analytic abilities of the social scientist and anthropologist. Because of this broad base, study in the department promotes fundamental academic skills and critical judgment and provides deeper understanding of national and international cultures. Thus, the religious studies major provides students with a foundation to pursue careers in business, government, counseling, law, medicine and journalism, as well as advanced professional study in religion. The department offers BA and MA degrees with majors in Religious Studies. A minor is also available.

### Double Majors

Students are encouraged to pursue dual majors that combine religion with other interests.

### Graduate

221 Arts & Science Bldg.  
 Columbia, MO 65211  
 573-882-4769  
<http://religiousstudies.missouri.edu/>

**Director of Graduate Studies:** Signe Cohen

- MA in Religious Studies (p. 270)

### About the Religious Studies MA Program

The master's program in religious studies at the University of Missouri is a two-year stand-alone graduate program in the academic study of

religion. Many of the program's alumni have gone on to PhD programs in religious studies or related disciplines, while others have completed the master's degree in order to enrich their educational lives or to prepare for work in journalism, education, law, or other fields that demand critical thinking and analytical skills.

The master's program offers training in the academic study of religion, with particular emphasis on theory and methods in religious studies. Students work closely with their advisors and mentors in order to develop and grow as scholars of the discipline. The department offers courses in the areas of Biblical Studies, History of Christianity, Religion in America, Islam, Judaism, Indigenous Religions, Hinduism, Buddhism, Religions of China and Japan, Women and Religion, and Religion and Neuroscience.

Students must complete a total of 30 credit hours at the graduate level, pass comprehensive exams in theory and methods in the academic study of religion, and complete a Master's thesis or portfolio.

## Undergraduate

### Department Level Requirements - Religious Studies

There are no requirements at the department level for this degree.

### BA in Religious Studies

#### Major Program Requirements

Students must earn a minimum GPA of 2.0 or higher in order to have the credit applied. In addition, students must complete all degree, college and university graduation requirements, including university general education (p. 18).

#### Major core requirements

REL_ST 1100	Introduction to Religion	3
or REL_ST 2110	Religions of the World	
REL_ST 3990	Majors Seminar	3
REL_ST 4100	Advanced Theories and Methods	3
REL_ST 4990	Senior Seminar in Religious Studies	3

#### Additional requirements

At least one course in Asian, Western, and Indigenous Religions.	18
<b>Total Credits</b>	<b>30</b>

### Semester Plan

Below is a **sample** plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
REL_ST 1100*	3	REL_ST 2310*	3
HIST 1100 or 1200	3	ENGLISH 1000	3
SPAN 1100	5	CL_HUM 1060	3
PSYCH 1000	3	ECONOM 1051	5

MATH 1100	3	SPAN 1200	5
	17		19
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
REL_ST 2500*	3	REL_ST 2100	3
SPAN 2100	3	Elective	3
BIO_SC 1010	3	GEOG 1100	3
English Literature	3	HIST 3820	3
PSYCH 2310	3		
	15		12
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
REL_ST 2610*	3	REL_ST 3200*	3
REL_ST 3710*	3	REL_ST 3990*	3
GEOG 1100	4	ANTHRO 1000	3
POL_SC 1100	3	AR_H_A 3760	3
	13		12
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
REL_ST 4100	3	Senior Seminar	3
PHYSICS 1050	3	Electives	9
Electives	9		
	15		12
Total Credits: 115			

\* Degree requirements that also meet University general education requirements

## Minor in Religious Studies

A minor in religious studies is available with the following requirements: a minimum of 15 credits (at least one course each in Asian, Western, and Indigenous Religions), including 6 in courses numbered 2000 or above. A minimum 2.0 MU GPA is required in all courses toward the minor.

## Graduate

## MA in Religious Studies

### Admission Contact Information

Prof. Signe Cohen  
 221 Arts & Science Bldg  
 Columbia, MO 65211  
 573-882-4760 or cohens@missouri.edu

### Admission Criteria

- Fall deadline:  
 February 1 (for consideration of financial aid)  
 April 1 (for students not seeking financial aid)
- Spring deadline: October 15
- Minimum GPA: 3.0

- Minimum GRE score: none set
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

## Required Application Materials

### To the Graduate School

All required Graduate School documents, including transcripts

### To the Religious Studies MA Program

Departmental application and writing sample  
 3 letters of recommendation (use departmental form)  
 GRE score report

## Additional Information

The match between the interests of applicants and the areas of emphasis offered in the program will be an important consideration in the evaluation of applications.

All application materials are available online, and applications should be submitted electronically at <https://app.applyyourself.com/?id=umc-grad>

Although electronic applications are preferred, a student may also print out the application materials and mail them to the Religious Studies Department at the following address:

The Director of Graduate Studies  
 The Department of Religious Studies  
 221 A&S  
 The University of Missouri  
 Columbia, MO 65211

International students should contact the Office for International Admissions. Students whose native language is not English should achieve a score of 550 or more on the TOEFL exam for admission to the program.

Applications must be completed at least six weeks before the start of graduate studies. Applicants seeking teaching assistantships or fellowships must submit applications no later than February 1. Notification of admission and awards will be made no later than April 1. Applicants who wish to enter the program in January of an academic year must submit materials no later than October 15.

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## Romance Languages

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Flore Zéphir, Chair  
Department of Romance Languages and Literature  
143 Arts and Science Building  
(573) 882-4874  
Fax: (573) 884-8171  
ZephirF@missouri.edu

The study of a foreign language allows for the development and refinement of communication, listening and speaking skills. Such study also endows students with a concern for world affairs and an appreciation of and respect for individual differences.

The Department of Romance Languages and Literatures offers language and literature courses in French, Italian, Portuguese and Spanish. Students may elect a major in Romance Languages with an emphasis in French or Spanish. Minors are also available in Afro-Romance literatures in Translation, French, Italian Area Studies, Luso-Brazilian Area Studies, Romance Literatures in Translation, and Spanish. The department also participates in the interdepartmental minor in film studies.

Double majors within the College of Arts and Science, as well as dual degree programs outside of the College of Arts and Science, can be arranged if the second degree is identified early. Combined programs with journalism, political science, agriculture, education and business are among the possibilities.

The department offers BA and MA degrees in Romance Languages with major emphasis in French and Spanish; an MA with a major in French Language Teaching or Spanish Language Teaching, and a PhD in Romance Languages. Minors are also available.

## Faculty

**Professor** R. Cavigiolo, J. Cordones-Cook\*\*, C. Lazzaro-Weis\*\*, M. J. Muratore\*\*, M. Ugarte\*\*, J. M. Zemke\*\*, F. Zéphir\*\*

**Associate Professor** A. Alaczar, M. Badiane\*\*, E. Blandón\*\*, J. Draper\*\*, R. B. Gallimore\*\*, V. M. Kaussen\*\*, C. D. Presberg\*\*, I. Reyna\*\*, D. Sipe, R. Tabanelli

**Assistant Professor** M. Moore\*, G. Pérez-Anzaldo#, M. Soria-López\*

**Teaching Associate Professor** D. Anzaldo-González\*, M. Marcos-Llinas, J. Otabela-Mewolo

**Teaching Assistant Professor** A. Aviles-Quinones\*, K. Fleak\*, D. M. Heston, J. Sandone

**Instructor** L. McCune, A. Wetzel

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 271)
- BA in Romance Languages (p. 272)
  - with emphasis in French (p. 272)
  - with emphasis in Spanish (p. 273)

## Graduate

Department of Romance Languages and Literature  
143 Arts and Science Building  
573-882-4874  
<http://romancelanguages.missouri.edu/grad.shtml>

**Director of Graduate Studies:** Charles Presberg

- MA in Romance Languages (p. 274)
  - with emphasis in French (p. 274)
  - with emphasis in Spanish (p. 277)
  - with emphasis in Language Teaching (p. 275)
- PhD in Romance Languages (p. 278)

## About the Department of Romance Languages and Literatures

The Department of Romance Languages and Literatures offers graduate degree programs with an emphasis in Spanish (p. 277), and French (p. 274), both with the option of an emphasis in foreign language teaching. The department's faculty and graduate student seminars are an interdisciplinary, interdepartmental series seeking to provide a collegial atmosphere in which scholars can present their recent work. The department strongly encourages study abroad as a way to reinforce language skills, broaden one's horizons, and add an unforgettable experience to a meaningful university education.

The Department of Romance Languages and Literatures at the University of Missouri has the country's only focus area in the field of Afro-Romance Studies. In order to facilitate research collaboration between our faculty members working in this field and scholars outside our institution, we have established the Institute for Languages and Literatures of the African Diaspora. The Institute serves first and foremost to expose black writers of French, Portuguese and Spanish expression to a wider audience.

## Specialization

The Department of Romance Languages and Literatures offers four fields of specialization at the doctoral level: French Literature, Francophone Literature, Spanish Literature or Spanish American Literature.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Undergraduate

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## Department Level Requirements- Romances Languages

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There are no requirements at the department level for this degree.

## BA in Romance Languages

### Major Program Requirements

The bachelor of arts degree in Romance Languages is offered in two emphasis areas: French (p. 272) and Spanish (p. 273). Students must choose one of the emphasis areas to earn the BA in Romance Languages. Details on the requirements for the programs are listed under each emphasis.

### Semester Plan

A sample plan of study has not been designed for this major, as students are required to select an emphasis. Refer to the semester plans designed for the emphasis in French (p. 272) or Spanish (p. 273).

## BA Romance Languages with Emphasis in French

### Major Program Requirements

Students may obtain a BA in Romance Languages with an emphasis in French with a minimum of 30 credits in French beyond FRENCH 2100. Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the major. Students must meet all major requirements listed below, as well as all College of Arts and Science and University graduation requirements, including University general education.

Students who work toward a double major (two degrees within the College of Arts and Science) may be able to complete the majors with a minimum of 120 credits. Students who are considering a dual degree program (in Arts and Science and in another school or college) are advised that a minimum of 132 credits are necessary.

To obtain the BA degree in Romance Languages with an emphasis in French, the following courses, or their equivalents, must be included in the graduation plan (numbers in parentheses indicate prerequisite courses).

#### Major core requirements

FRENCH 2160	Intermediate French Composition and Conversation	3
FRENCH 3160	Advanced French Composition and Conversation I	3
or FRENCH 3280 Commercial French		
FRENCH 3410	Introduction to Literary Analysis	3
FRENCH 3420	Introduction to French Literature I	3
FRENCH 3430	Introduction to French Literature II	3
FRENCH 4130	Stylistics	3

### Additional Requirements

- Students must complete five additional 4000-level courses (one of which must be stylistics and one must be a capstone) selected with the advisor's approval. FRENCH 4960: Special Readings in French cannot be used to fulfill this requirement except by permission of the department chair.
- Students beginning at a level higher than FRENCH 2160 due to placement testing must still complete 30 credits in order to receive the major.

- In addition, the student is required to take a Writing Intensive course in the major, normally designated sections of FRENCH 3420 or FRENCH 3430, and must complete a minor.
- It is highly recommended that students take FRENCH 2310: French Civilization as an elective and, if at all possible, study for a summer, a semester or a full year in a French-speaking country.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

First Year			
Fall	Credits	Spring	Credits
FRENCH 2160 <sup>^</sup>	3	FRENCH 3160 <sup>^</sup>	3
ENGLISH 1000 <sup>*</sup>	3	Science with Lab <sup>*</sup>	5
MATH 1100 <sup>*</sup>	3	Behavioral Science Course <sup>*</sup>	3
Social Science Course <sup>*</sup>	3	Social Science Course <sup>*</sup>	3
	12		14
Second Year			
Fall	Credits	Spring	Credits
Science Course <sup>*</sup>	3	FRENCH 3430 <sup>^</sup>	3
FRENCH 3410 <sup>^</sup>	3	Science Course <sup>*</sup>	3
Humanities Course <sup>*</sup>	3	Humanities Course <sup>*</sup>	3
Behavioral Science Course <sup>*</sup>	3	Humanities Course <sup>*</sup>	3
	12		12
Third Year			
Fall	Credits	Spring	Credits
FRENCH 3420 <sup>^</sup>	3	FRENCH 4000-level <sup>^</sup>	3
Social Science Course <sup>*</sup>	3	FRENCH 4130 <sup>^</sup>	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
FRENCH 4000-level <sup>^</sup>	3	FRENCH 4993 (Capstone) <sup>^</sup>	3
FRENCH 4000-level <sup>^</sup>	3	Elective Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Elective Course	3
Elective Course	3	Humanities Course <sup>*</sup>	3
	15		15
Total Credits: 110			

<sup>^</sup> Course meets degree program requirements

<sup>\*</sup> Course meets University general education and/or campus requirements



Electives may be replaced by courses that fulfill requirements for a double/dual major or a minor.

## BA Romance Languages with Emphasis in Spanish

### Major Program Requirements

Students may obtain a BA in Romance Languages with an emphasis in Spanish with a minimum of 30 credits in Spanish beyond SPAN 2100. Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the major. Students must meet all major requirements listed below, as well as all College of Arts and Science and University graduation requirements, including University general education (p. 18).

Students who work toward a double major (two degrees within the College of Arts and Science) may be able to complete the majors with a minimum of 120 credits. Students who are considering a dual degree program (in Arts and Science and in another school or college) are advised that a minimum of 132 credits are necessary.

To obtain the BA degree in Romance Languages with an emphasis in Spanish, the following courses, or their equivalents, must be included in the graduation plan (numbers in parentheses indicate prerequisite courses):

#### Major core requirements

SPAN 2160	Intermediate Spanish Composition and Conversation (SPAN 2100)	3
SPAN 3150	Advanced Spanish Conversation (SPAN 2160)	3
	OR SPAN 3720: Spanish Phonetics (SPAN 2160)	
SPAN 3160	Advanced Spanish Composition (SPAN 2160)	3
	OR SPAN 3280: Commercial Spanish (SPAN 2160)	
SPAN 3420	Introduction to Hispanic Literature I (SPAN 3160)	3
SPAN 3430	Introduction to Hispanic Literature II (SPAN 3160)	3

### Additional Requirements

Students must complete five 4000-level courses (one of which must be a capstone) selected with the advisor's approval. These courses must be distributed in one of the following options:

- Option 1: two peninsular lit., two Spanish-American lit., one course of choice (one course must be capstone).
- Option 2: one peninsular lit., one Spanish-American lit., one language/civilization, one capstone and one course of choice.

It should be noted that SPAN 4960 Special Readings in Spanish cannot be used to fulfill this requirement except by permission of the department chair. Students who plan to teach at any level should include courses SPAN 3160 and SPAN 3721, rather than their alternates.

- Students beginning at a level higher than SPAN 2160 due to placement testing must still complete 30 credits in order to receive the major.
- In addition, the student is required to take a Writing Intensive course in the major, normally designated sections of SPAN 3420 or SPAN 3430, and must complete a minor.
- It is highly recommended that students take SPAN 2310 Spanish Civilization as an elective and, if at all possible, study for a summer, a semester or a full year in a Spanish-speaking country.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
SPAN 2160 <sup>^</sup>	3	SPAN 3150 or 3721 <sup>^</sup>	3
ENGLISH 1000 <sup>*</sup>	3	Science/Science Lab <sup>*</sup>	5
MATH 1100 <sup>*</sup>	3	Behavioral Science <sup>*</sup>	3
Social Science <sup>*</sup>	3	Social Science <sup>*</sup>	3
	<b>12</b>		<b>14</b>
Second Year			
Fall	Credits	Spring	Credits
Science <sup>*</sup>	3	SPAN 3420 or 3430 <sup>^</sup>	3
SPAN 3160 or 3280 <sup>^</sup>	3	Science <sup>*</sup>	3
Humanities <sup>*</sup>	3	Humanities <sup>*</sup>	3
Behavioral Science <sup>*</sup>	3	Humanities <sup>*</sup>	3
	<b>12</b>		<b>12</b>
Third Year			
Fall	Credits	Spring	Credits
SPAN 3420 or 3430 <sup>^</sup>	3	SPAN 4000-level <sup>^</sup>	3
Social Science <sup>*</sup>	3	SPAN 4130 <sup>^</sup>	3
Elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
	<b>15</b>		<b>15</b>
Fourth Year			
Fall	Credits	Spring	Credits
SPAN 4000-level <sup>^</sup>	3	SPAN 4993 <sup>^</sup>	3
SPAN 4000-level <sup>^</sup>	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
Elective	3	Humanities	3
	<b>15</b>		<b>15</b>
Total Credits: 110			

<sup>^</sup> Course meets degree program requirements

<sup>\*</sup> Course meets University general education and/or campus requirements

Electives may be replaced by courses that fulfill requirements for a double/dual major or a minor.

### Graduate

## MA in Romance Languages

The master of arts degree in Romance Languages is offered in three emphasis areas. Students must choose one of the emphasis areas listed below:

- French (p. 274)
- Spanish (p. 277)
- Language Teaching (p. 275)

Details on the requirements for the programs are listed under each emphasis.

## MA in Romance Languages with emphasis in French

### Admission Contact Information

Mary Harris

143 Arts and Science

Columbia, MO 65211

573-882-5039

<http://romancelanguages.missouri.edu/grad.shtml>

### Admission Criteria

Fall deadline: February 15

Spring deadline: October 15

- Minimum GPA: 3.0 in field of major
- Masters applicants must have a bachelor's degree
- Minimum TOEFL scores (international applicants):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

**Note:** Applicants must also demonstrate adequate preparation in advanced language and literature courses. This will require their having completed at least four courses equivalent to a 4000-level course for masters applicants or a 7000 level course for doctoral applicants at the University of Missouri. At a minimum, three of these courses must be in literature. If the faculty determines a deficiency, they will require that the student complete remedial course work in literature during the first year of enrollment. The director of graduate studies will inform students of these additional requirements at the time of their admission.

### Required Application Materials

#### *To the Graduate School*

- All required Graduate School documents
- Official Transcript
- 10-15 page writing sample in language of desired degree program, must be uploaded to the online application
- 500-word Personal Statement, uploaded to the online application
- 3 letters of recommendation (submitted through Apply Yourself or mailed to the Romance Languages Department, 143 Arts & Science, University of Missouri, Columbia, MO 65211)
- Résumé or CV

### Choosing an Adviser

All graduate students in the department may choose, or the director of graduate studies will assign them, an academic adviser at the start

of their first semester of graduate study. Students must choose an academic adviser by the end of their first semester of graduate study.

### Plan of Study

The department offers MA degrees with an emphasis in both French and Spanish (Peninsular or Spanish-American literature).

### Minors

Students may also elect a minor field of study, which requires a minimum of 9 hours of course work completed in another department or other departments. Students interested in such minors should consult the section titled Plan of Study in the Graduate Catalog. These minor fields appear on students' plan of study, but not on their transcript. Students electing minors must complete the standard MA examination in their major field of emphasis (French or Spanish).

### MA Degree Requirements

Students must complete a total of 30 credit hours at the graduate-level to earn their MA degree. At least 15 hours must be in courses at the 8000 level or above. The plan of study for the MA with an emphasis in Spanish must include a minimum of nine hours of course work in Spanish peninsular literature and a minimum of nine hours of course work in Spanish-American literature. The plan of study for an MA with an emphasis in Spanish must also include three credit hours in the history of the Spanish language (completion of or the equivalent).

For the MA with an emphasis in either French or Spanish, the total number of credit hours in special readings (7960), problems (8085) or any combination of both may not exceed twelve. The number of credit hours in special readings (7960) within the student's major field may not exceed three per semester. Graduate Instructors with no pedagogical experience or those who have completed no graduate course in foreign language teaching methodology will be required to take French/Spanish 7120, Foreign Language Teaching Methodology.

Non-native speakers will be required to complete an online proficiency assessment with the appropriate course coordinator before a decision on their admission status is finalized by the department.

### Submitting Your Plan of Study to the Graduate School Office

MA candidates must submit a completed M-1 Plan of Study form to the Graduate School at least one semester before taking their MA examinations.

### Funding Through Graduate Instructorships

MA candidates normally receive 4 semesters of financial support from the University while completing their degree. This support will customarily take the form of a graduate instructorship, though it may take the form of either a research or teaching assistantship.

### Possible Fifth Semester of Support

In exceptional cases, students in good standing — with no grades of Incomplete and unproblematic teaching — may receive a fifth semester of support, at the discretion of the faculty. Faculty will award a fifth semester of support according to the department's need for instructors. Students must submit all requests for a fifth semester of support in writing to the director of graduate studies. No student will receive more than five semesters of support.

## Normal Teaching Load vs. Course Load

The minimum teaching assignment for MA candidates holding instructorships is 1 course per semester, although there may be an opportunity for two. International students may never teach more than 2 courses per semester owing to visa restrictions. All MA candidates must be registered in a minimum of 6 hours of course work for each semester in which they hold an instructorship. Students may enroll in up to 6 hours per semester of 8080 (Readings) if they have completed all their course work and are preparing for their MA exams.

## Annual Review

The faculty and course directors in both major languages meet during the fall and spring semesters to evaluate the teaching and academic performance of all graduate students. The director of graduate studies informs all students in writing of their status at the end of each semester. Students who fail to remove a grade of Incomplete will be limited to teaching one course per semester for as long that grade of Incomplete remains on their academic record.

## Master's Thesis

The writing of a thesis is optional. A minimum of 4 hours and a maximum of 6 hours of 8090 Research will be allowed for the thesis. Students are urged to obtain the Graduate School's guidelines for thesis/dissertation writing as the thesis must conform to the Graduate School's formatting and style specifications.

## Thesis Committee

Students choosing to write a thesis must name a thesis committee consisting of no fewer than three members of the doctoral faculty at the University of Missouri, one of whom should be from a department other than the Department of Romance Languages and Literatures.

## Comprehensive Examination for the MA degree

All candidates for the Master of Arts degree must pass a 6-hour written examination based on the MA reading list. The examination is given twice a year, generally in late October and late March.

The French Master's examination consists of six 1-hour parts covering literature of the Middle Ages/Renaissance, 17th, 18th, and 19th centuries, and two of the following three periods in the contemporary period: twentieth century French Literature, twentieth century Francophone Literature, contemporary literary theory.

The Spanish examination consists of two 3-hour examinations. The first component covers Peninsular Spanish literature from the Middle Ages to the present and the second component covers Spanish American literature from the Colonial period to the present.

At least half the examination must be written in the candidate's language of specialization.

## Grading of the Comprehensive Exam

The MA examination is graded as follows: High Pass, Pass, and Fail. In order to receive a passing grade on any section of the examination, a student must receive passing grades from two thirds of the examining committee. To pass the entire examination, students must receive passing grades on all sections. With permission from the examining committee, students who fail part of the examination may retake only the failed section or sections of the examination. Two failures of the

examination, in whole or in part, will terminate candidacy for the degree and result in dismissal from the program.

## MA in Romance Languages with emphasis in Language Teaching

### Admission

Students desiring to work for the degree of Master of Arts, Emphasis on Language Teaching (MALT) should apply directly online to the Graduate School. Applicants can find links for information, instructions for applying and the online application form on the Graduate School's site (<http://gradschool.missouri.edu/admissions>). This online form is submitted electronically to the Graduate School, along with the application fee.

Additionally, the following materials submitted via the Graduate School's Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) system:

- Official transcripts from the institution(s) previously attended
- TOEFL scores (international applicants only)
- Photocopies of diplomas earned at colleges/universities outside the US (international applicants only)

In addition, our department requires the following materials from all applicants:

- Departmental Graduate Studies Application
- Three Letters of Reference
- A 10-15 page-writing sample
- 500-word personal statement detailing the applicant's reasons for selecting the University of Missouri for graduate studies and academic/career goals. Applicants may also send other supporting materials, such as a résumé, if desired.

The application form and the form for reference letters are available on the Department's page (<http://romancelanguages.missouri.edu>).

### Eligibility

Candidates for the MA must hold a Bachelor's degree (or equivalent) with a grade point average of 3.0 or better in their major field of study. They must also demonstrate adequate preparation in advanced language and literature courses for admission. This will normally be four courses equivalent to a 4000-level course at the University of Missouri. At least three of these courses must be in literature or linguistics. If the Admissions Committee believes that a deficiency exists, it will prescribe additional course work (during the first year of enrollment) beyond the 30 credit hours necessary for the MALT degree. The Director of Graduate Studies will inform students of these additional requirements at the time of admission.

All non-native speakers of French/Spanish will be required to complete an online proficiency assessment prior to admission. Applicants will be contacted by the appropriate course coordinators to schedule this assessment. Students who are judged deficient in any of these areas are required to do remedial work. New graduate students who are required to do remedial work because of the departmental language proficiency examination will be retested within one year. Students must receive a passing score, or their candidacy will be terminated.

All graduate students will be assigned an advisor by the Director of Graduate Studies at the start of their first semester of graduate study.

## MALT Program of Study

A total of 30 hours selected from courses receiving graduate credit must be completed for the MALT (Master of Arts in Language Teaching). A minimum of 21 of the 30 hours must be taken in either French or Spanish. At least 15 hours must be in courses at the 8000 level or above. Of these 8000-level courses, six hours must be in the Department of Romance Languages. The remaining 9 hours may be taken from course work outside the department with the approval of the student's academic adviser.

Note: The College of Education no longer offers a certification program in the field of foreign language education. However, students who do not have a teaching certificate and who are interested in completing relevant courses in the field of education while working on their MALT will need to contact the professional advisors in the School of Education. These students, with advisor's consent, could use their 9 hours allowed outside the department-provided that they are graduate-level courses-toward courses in education. At the completion of their MA, students can work directly with the Missouri Department of Elementary and Secondary Education to see how they can be certified in the State of Missouri.

Please note also that the number of hours of credit allowed for Special Readings (7960) and Problems (8085) may not exceed twelve. MA candidates may not take more than one of these two independent readings course per semester.

Students wishing to transfer MA credits from another university may transfer up to six hours, provided these courses were taken within the last eight years.

MALT candidates must submit a completed M-1 Program of Study to the Graduate School at least one semester before completing their comprehensive examinations.

## Teaching Assistants

MALT students normally have 4 semesters of support in which to complete their degree. This support will customarily take the form of a Graduate Instructorship. MA students may not teach more than ten hours per semester. A fifth and final semester may be granted in exceptional circumstances to students in good standing (i.e., no incompletes, history of good teaching, etc.). This extra semester will be awarded on the basis of departmental need and will be granted only if a request is made formally and in writing to the Graduate Studies Committee, which will make its recommendation to the entire faculty. No student will receive support beyond the fifth semester.

The normal course load for MALT candidates holding teaching assistantships is 9 hours. All MALT candidates must register for a minimum of 6 hours of graded courses included in the Master's program in every semester in which they hold a teaching assistantship. Exceptions to this regulation must have the approval of the Graduate Studies Committee prior to registration. International students must not fall below six hours or they will lose their student status. Students who have completed all coursework may enroll in up to 6 hours per semester of 8080 (Readings) in order to prepare for the MALT exam.

The faculty and the course directors in each of the major languages will meet during the fall and winter semesters to evaluate the performance of all graduate students as students and as teaching assistants. The Director of Graduate Studies will inform all students in writing of their status following this formal performance review.

Any student who fails to have an incomplete removed within one year of its issuance will be limited to teaching one class per semester until the incomplete grade is removed. This excludes Dissertation/Thesis (9090) courses.

## Course Distribution

The course distribution for the MALT program is as follows:

### WITHIN THE DEPARTMENT

<b>* Language/Linguistics</b>	6
Course may be take from:	
FRENCH 7710 History of the French Language	3
FRENCH 7130 Stylistics	3
FRENCH 7720 Structure of Modern French	3
or any French language/linguistic course approved by the student's advisor	
<b>* Civilization/Culture</b>	3-6
FRENCH 7510 African Francophone Literature	3
FRENCH 7980 Special Themes in French	3
FRENCH 8087 Seminar in French	3
<b>* Literature</b>	3-6
French: any one or two courses in French or Francophone literature at the 7000 level or above (see Graduate Courses for wide range of offering)	
<b>* Methodology/Second Language Acquisition</b>	9
FRENCH 7120 Foreign Language Teaching Methodology	3
or SPAN 7120 Foreign Language Teaching Methodology	
FRENCH 8087 Seminar in French	3
or SPAN 8087 Seminar in Spanish	
FRENCH 8120 Bilingualism and Language Contact	3
or SPAN 8120 Bilingualism and Language Contact	

### OUTSIDE THE DEPARTMENT (UP TO 9 HRS)

\*\* For students interested in education, suggested courses from the College of Education can include:

- ESC\_PS 7000 Foundation of Teacher Prep I
- SPC\_ED 7020 Foundation of Teacher Prep II

#### Preparation II (4)

\*\* For students interested in ESL, courses can include:

- Structure of American English (3)
- History of the English Language (3)
- Regional and Social Dialects of English (3)

**Please Note:** Courses taken outside the department must be approved by the student's academic advisor.

## Comprehensive Examination for the MALT degree

All graduate students in Language Teaching are required to pass a series of examinations in order to fulfill degree requirements.

## \* Written Examination

All students take a six-hour written examination, which consists of three two-hour components. Two of the components include: a) Foreign Language Methodology and Second Language Acquisition; b) Applied Linguistics. In addition, each candidate will be examined in a third field of their choice, either civilization/culture or literature. The two-hour written questions will reflect the coursework completed by each candidate and appropriate texts suggested by faculty represented on the examination committee. These examinations are generally given in November and March.

The MALT examination is graded as follows: High Pass, Pass, and Fail. In order to receive a passing grade, the candidate must attain a Pass in all fields of the written examination. Should a candidate fail any part of the exam and wish second consideration for the degree (s)he must retake the failed section(s). Two failures eliminate the candidate from consideration for the MA in language teaching.

## MA in Romance Languages with emphasis in Spanish

### Admission Contact Information

Mary Harris  
 143 Arts and Science  
 Columbia, MO 65211  
 573-882-5039  
<http://romancelanguages.missouri.edu/grad.shtml>

### Admission Criteria

Fall deadline: February 15  
 Spring deadline: October 15

- Minimum GPA: 3.0 in field of major
- Masters applicants must have a bachelor's degree
- Minimum TOEFL scores (international applicants):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Applicants must also demonstrate adequate preparation in advanced language and literature courses. This will require their having completed at least four courses equivalent to a 4000-level course for masters applicants or a 7000 level course for doctoral applicants at the University of Missouri. At a minimum, three of these courses must be in literature. If the faculty determines a deficiency, they will require that the student complete remedial course work in literature during the first year of enrollment. The director of graduate studies will inform students of these additional requirements at the time of their admission.

### Required Application Materials

*To the Graduate School*

- All required Graduate School documents
- Official Transcript
- 10-15 page writing sample in language of desired degree program, must be uploaded to the online application

- 500-word Personal Statement, uploaded to the online application
- 3 letters of recommendation (submitted through Apply Yourself ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)) or mailed to the Romance Languages Department, 143 Arts & Science, University of Missouri, Columbia, MO 65211)
- Résumé or CV

### Choosing an Advisor

All graduate students in the department may choose, or the director of graduate studies will assign them, an academic advisor at the start of their first semester of graduate study. Students must choose an academic advisor by the end of their first semester of graduate study.

### Plan of Study

The department offers MA degrees with an emphasis in both French and Spanish (Peninsular or Spanish-American literature).

### Minors

Students may also elect a minor field of study, which requires a minimum of 9 hours of course work completed in another department or other departments. Students interested in such minors should consult the section titled Plan of Study in the Graduate Catalog. These minor fields appear on students' plan of study, but not on their transcript. Students electing minors must complete the standard MA examination in their major field of emphasis (French or Spanish).

### MA Degree Requirements

Students must complete a total of 30 credit hours at the graduate-level to earn their MA degree. At least 15 hours must be in courses at the 8000 level or above. The plan of study for the MA with an emphasis in Spanish must include a minimum of nine hours of course work in Spanish peninsular literature and a minimum of nine hours of course work in Spanish-American literature. The plan of study for an MA with an emphasis in Spanish must also include three credit hours in the history of the Spanish language (completion of or the equivalent).

For the MA with an emphasis in either French or Spanish, the total number of credit hours in special readings (7960), problems (8085) or any combination of both may not exceed twelve. The number of credit hours in special readings (7960) within the student's major field may not exceed three per semester. Graduate Instructors with no pedagogical experience or those who have completed no graduate course in foreign language teaching methodology will be required to take FRENCH 7120/SPAN 7120, Foreign Language Teaching Methodology.

Non-native speakers will be required to complete an online proficiency assessment with the appropriate course coordinator before a decision on their admission status is finalized by the department.

## Submitting Your Plan of Study to the Graduate School Office

MA candidates must submit a completed M-1 Plan of Study form to the Graduate School at least one semester before taking their MA examinations.

## Funding Through Graduate Instructorships

MA candidates normally receive 4 semesters of financial support from the University while completing their degree. This support will customarily take the form of a graduate instructorship, though it may take the form of either a research or teaching assistantship.

## Possible Fifth Semester of Support

In exceptional cases, students in good standing — with no grades of Incomplete and unproblematic teaching — may receive a fifth semester of support, at the discretion of the faculty. Faculty will award a fifth semester of support according to the department's need for instructors. Students must submit all requests for a fifth semester of support in writing to the director of graduate studies. No student will receive more than five semesters of support.

## Normal Teaching Load vs. Course Load

The minimum teaching assignment for MA candidates holding instructorships is 1 course per semester, although there may be an opportunity for two. International students may never teach more than 2 courses per semester owing to visa restrictions. All MA candidates must be registered in a minimum of 6 hours of course work for each semester in which they hold an instructorship. Students may enroll in up to 6 hours per semester of 8080 (Readings) if they have completed all their course work and are preparing for their MA exams.

## Annual Review

The faculty and course directors in both major languages meet during the fall and spring semesters to evaluate the teaching and academic performance of all graduate students. The director of graduate studies informs all students in writing of their status at the end of each semester. Students who fail to remove a grade of Incomplete will be limited to teaching one course per semester for as long that grade of Incomplete remains on their academic record.

## Master's Thesis

The writing of a thesis is optional. A minimum of 4 hours and a maximum of 6 hours of 8090 Research will be allowed for the thesis. Students are urged to obtain the Graduate School's guidelines for thesis/dissertation writing as the thesis must conform to the Graduate School's formatting and style specifications.

## Thesis Committee

Students choosing to write a thesis must name a thesis committee consisting of no fewer than three members of the doctoral faculty at the

University of Missouri, one of whom should be from a department other than the Department of Romance Languages and Literatures.

## Comprehensive Examination for the MA degree

All candidates for the Master of Arts degree must pass a 6-hour written examination based on the MA reading list. The examination is given twice a year, generally in late October and late March.

The French Master's examination consists of six 1-hour parts covering literature of the Middle Ages/Renaissance, 17th, 18th, and 19th centuries, and two of the following three periods in the contemporary period: twentieth century French Literature, twentieth century Francophone Literature, contemporary literary theory.

The Spanish examination consists of two 3-hour examinations. The first component covers Peninsular Spanish literature from the Middle Ages to the present and the second component covers Spanish American literature from the Colonial period to the present.

At least half the examination must be written in the candidate's language of specialization.

## Grading of the Comprehensive Exam

The MA examination is graded as follows: High Pass, Pass, and Fail. In order to receive a passing grade on any section of the examination, a student must receive passing grades from two thirds of the examining committee. To pass the entire examination, students must receive passing grades on all sections. With permission from the examining committee, students who fail part of the examination may retake only the failed section or sections of the examination. Two failures of the examination, in whole or in part, will terminate candidacy for the degree and result in dismissal from the program.

## PhD in Romance Languages

### Note to Internal Doctoral Applicants

Students who wish to advance to the doctoral program after completing their MA degree in the Department of Romance Languages and Literatures may do so only after receiving written approval from the MA examining committee. Alternatively, candidates may not advance to the doctoral program if the examining committee determines, after the MA examination, that their degree is terminal.

Students advancing directly from the MA to the PhD program need to complete only a Change of Degree Program form, which the department submits to the Graduate School.

Students who apply to the doctoral program one semester or more after completing their MA examinations must complete a Request to Re-enroll form and reapply to the doctoral program. They must submit a new departmental application and reference letters. They need not submit a new application to the Graduate School.

## Application and Admission Information

Admission Contact Information

Mary Harris

143 Arts and Science

Columbia, MO 65211

573-882-5039

<http://romancelanguages.missouri.edu/grad.shtml>

## PhD Admission Criteria

Fall deadline: February 15

Spring deadline: October 15

- Minimum GPA: 3.0 in field of major
- Doctoral applicants must have a master's degree.
- Minimum TOEFL scores (international applicants):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Applicants must also demonstrate adequate preparation in advanced language and literature courses. This will require their having completed at least four courses equivalent to a 4000-level course for masters applicants or a 7000 level course for doctoral applicants at the University of Missouri. At a minimum, three of these courses must be in literature. If the faculty determines a deficiency, they will require that the student complete remedial course work in literature during the first year of enrollment. The director of graduate studies will inform students of these additional requirements at the time of their admission.

## Required Application Materials

*Submit to the Graduate School using the online application system:*

- All required Graduate School documents
- Official Transcript (send to Graduate School at 210 Jesse Hall, University of Missouri, Columbia, MO 65211-1160)
- 10-15 page writing sample in language of desired degree program, must be uploaded to the online application
- 500-word Personal Statement, uploaded to the online application
- 3 letters of recommendation (submitted through Apply Yourself or mailed to the Romance Languages Department, 143 Arts & Science, University of Missouri, Columbia, MO 65211)
- Résumé or CV

**Note:** All application forms are on the Graduate School site

## Specialization

The Department of Romance Languages and Literatures offers four fields of specialization at the doctoral level: French Literature, Francophone Literature, Spanish Literature or Spanish American Literature.

Candidates may elect a secondary field, which entails a minimum of 9 hours of course work within another department, in consultation with their doctoral program committee. This secondary field appears on students' plan of study, but not on their transcript. Students electing a secondary field must complete a PhD examination that will include at least one question devoted to their secondary field.

## Choosing an Adviser

All graduate students in the department may choose, or the director of graduate studies will assign them, an academic adviser at the start of their first semester of graduate study. Students must choose an academic adviser by the end of their first semester of graduate study.

## Qualifying Examination

All PhD candidates must complete a qualifying examination during their first year in the program to determine their fitness for doctoral study.

## Exemptions

The faculty may excuse students from this requirement if those students received their MA degree from this department, earned a grade of High Pass on all sections of their MA examination, and enrolled in the PhD program the semester after fulfilling all requirements for the MA degree.

## Purpose and Questions

The qualifying examination provides an opportunity for the faculty to evaluate candidates and advise their future course of study in the program. The examination consists of two questions related to the candidate's course work during the previous and current semester: one question requires analysis of a text; the other, discussion of a general topic (e.g., a literary genre, a particular author, a critical or artistic movement, and so on). The candidate's academic adviser delivers both questions to the candidate three days before a meeting with the examining committee.

## Exam Meeting with the Committee

At this meeting, the candidate offers two oral presentations of 20-25 minutes each, based on the two questions. Following these presentations, the candidate responds to comments and questions from the examining committee. At the close of this meeting, the examining committee determines whether the candidate's performance warrants a grade of Pass or Fail. The examining committee communicates these results to the Graduate School in writing, on a D-1 form bearing the signatures of the candidate and all members of the committee. Students who receive a failing grade must retake this examination before the end of the following semester. A second failure on this examination terminates eligibility for the PhD degree and will result in dismissal from the graduate program.

## Arranging the Committee

All arrangements for the qualifying examination are the joint responsibility of the candidate and the candidate's academic adviser. Any tenured or tenure-track member of the faculty may act as academic adviser to students during their first year of doctoral study. The academic adviser need not act as the director of that student's PhD examination or dissertation committee.

## Submitting Results

Students who earn a passing grade on their qualifying examination submit the D-1 form to the Graduate School, communicating the results of the examination and formally naming their doctoral committee.

## Plan of Study & Degree Requirements

After the qualifying exam, students and their doctoral committee meet to devise a plan of study. The doctoral committee signs and submits this plan of study with the D-2 form to the Graduate School. Students in the PhD program must complete a minimum of 72 hours of course work, which includes a maximum of 30 credit hours earned as part of their MA degree. These credit hours must include course work in language teaching methodology (FRENCH 7120/SPAN 7120 or the equivalent) and, if applicable, the candidate's secondary field. Spanish doctoral candidates must also complete course work in Old Spanish.

## Foreign Language Requirements

PhD candidates must demonstrate reading proficiency in 2 languages other than English and their language of specialization (French or Spanish). They may satisfy this requirement, at a minimum, by completing intensive beginning courses in the required languages (4070 or the equivalent) with a grade of B- or better, or by passing written examinations administered by departments at the University of Missouri offering courses in those languages. Students choosing Latin as one of their foreign languages may satisfy this requirement by completing with a grade of B- or better, a beginning honors class (LATIN 1100H, or the equivalent). Students also fulfill this requirement if they demonstrate proficiency by objective measures (courses, examinations) that exceed this minimum standard, as approved by the Director of Graduate Studies.

Students must satisfy the foreign language requirement before they take their Comprehensive Examination for the PhD. Basic language courses carry no credit toward the PhD and are therefore not included in the Plan of Study.

## Latin Requirements for Students of Medieval and Renaissance Literatures

Students specializing in literature of either the Middle Ages or the Renaissance- literature produced within the period from the rise of the vernacular to the end of the seventeenth century- must demonstrate reading proficiency in Latin. In doing so, they fulfill half their foreign language requirement. They demonstrate proficiency in Latin according to the standard explained in the previous paragraph: by means of a beginning Honors course (LATIN 1100H), a written examination administered by the Classics Department, or equivalents of these.

## Language Requirements for Students With Secondary Field in Non-English Literature

Students pursuing a secondary field in a non-English literature different from that of their major field must complete with a final grade of B- or better at least three 7000-level courses (or the equivalent) in literature of their secondary field. Completing these courses fulfills half the foreign language requirement.

For example, a student specializing in French literature of the Romantic period may choose a secondary field of German literature of the Romantic period. That student must complete 3 courses in German literature at the 7000 level (or the equivalent). Completing these courses satisfies half the foreign language requirement.

## Financial Support: Graduate Instructorships

PhD candidates normally receive 6 semesters of financial support from the university while completing their plan of study and 4 additional semesters of support after completing their PhD examination. This support will customarily take the form of a Graduate Instructorship, though it may take the form of either a Research or Teaching Assistantship.

The minimum teaching assignment for PhD candidates holding instructorships is one course during their first semester of study. Depending on staffing needs, there may be an opportunity to teach two courses per semester. Students writing their dissertation may teach an additional course. International students may never teach more than 2 courses per semester owing to visa restrictions. All PhD candidates must be registered in a minimum of 6 hours of course work for each semester in which they hold an instructorship.

Students may enroll in a maximum of 6 hours per semester of 9080 (Readings) if they have completed all their course work and are preparing for their PhD exams. Students may enroll in a maximum of 12 hours of 9080 (Readings) over the course of their doctoral studies, provided this occurs within their first six semesters of financial support. After passing their PhD examination, students may retain their Instructorships if they enroll in Research (9090) for a minimum of 5 credit hours per year (2 in fall; 2 in spring; 1 in summer).

## Annual Review

The faculty and course directors in both major languages meet during the fall and spring semesters to evaluate the teaching and academic performance of all graduate students. The director of graduate studies informs all students in writing of their status at the end of each semester. Students who fail to remove a grade of Incomplete will be limited to teaching one course per semester as long that grade of Incomplete remains on their academic record. This restriction applies to courses other than Research (9090).

## The PhD Comprehensive Examination

### Reading List, Examining Committee, and Faculty Preparing Questions

Each candidate will name a PhD Examining Committee and, as necessary, other faculty members who will prepare examination questions relating to their respective periods of expertise. The Examining Committee consists of at least 4 members: 3 members of the regular (tenured or tenure-track) faculty from the Department of Romance Languages and Literatures, including the student's academic advisor, 1 outside member from a different department. All of them must belong to the graduate faculty at the University of Missouri. Beyond this minimum, candidates may name other members to the committee - recognized experts in the candidates field - from either the University of Missouri or another institution, with the approval of both the student's academic advisor and the Director of Graduate Studies.

A member of the regular faculty in the Department of Romance Languages and Literatures who is an expert in literature pertaining to each part of the PhD examination will prepare questions for that part. If there is only one available expert in a specific field (for example, only one regular faculty member who is an expert in Medieval literature of either France or Spain), that faculty member must prepare and grade examination questions relating to that field. If there is more than one expert available in a particular field (for example, more than one member of the regular faculty who is an expert in contemporary French literature, contemporary Spanish literature, or contemporary Spanish-American literature), the student may choose one of those faculty members to prepare and grade questions in that field.

All questions on the PhD Examination derive from a reading list that the candidate compiles with the collaboration and approval of the Doctoral Committee and of all other faculty preparing questions. This list aims at both breadth and depth, but mainly depth. It should include texts of literature, criticism, and history that are indispensable for an expert in the candidate's specialized field. Yet, in the non-specialized fields, this list should include a solid literary history of all genres in the period (drama, fiction, lyric, essay), while also including literary texts that would prove indispensable only for an undergraduate survey course that the candidate might teach on works of all periods and all genres over a span of two semesters. In other words, readings from this list should yield both a



generalist and a specialist - an instructor who can both design and teach a survey course, and an expert who can produce original scholarship.

## **Timetable of the PhD Comprehensive Examination in French and Spanish**

The candidate and the academic advisor set both the dates and the order for all parts of the Comprehensive Examination, in consultation with the Director of Graduate Studies. The Comprehensive Examination in French or Spanish consists of a written and an oral section. The written section comprises 4 parts of 3 hours per part. Candidates complete the written examination on 4 separate days - 1 part per day - within a period of 14 days. They complete the oral examination no later than five weeks after earning a passing grade on all parts of the written examination. This allows candidates to complete the written examination at the end of the fall semester and to complete the oral examination at the start of the spring semester of the same scholastic year.

Either the Director of Graduate Studies or someone delegated by the Director of Graduate Studies will administer the written part of the PhD Examination. Only members of the department faculty or departmental staff may administer the examination.

### **Oral Examination**

Students complete the oral examination after receiving a passing grade on all sections of the written examination. The oral examination will last 1-2 hours, part of which must be in the language of the candidate's specialized field. The oral exam allows candidates to clarify, strengthen or amplify the answers of the written exam. Only members of the Doctoral Committee must attend the oral examination.

With permission from the Doctoral Committee, students who fail part of the written or oral examination may retake only the failed part of parts. A minimum of 14 days must elapse before a student retakes a failed part or failed parts of the examination. Two failures of the examination, in whole or in part, will terminate candidacy for the degree and result in dismissal from the program.

### **Prospectus**

After passing both the written and oral parts of the PhD Examination, doctoral students present a prospectus of the dissertation. This presentation occurs immediately after completing and passing the oral part of the Examination. Candidates prepare the prospectus in consultation with the academic advisor and deliver it in writing at least one week before the date of the oral examination to all members of the Doctoral Committee. The Prospectus requires approval by all members of the Doctoral Committee.

The prospectus presents a working outline, with a working bibliography, of the proposed project - its topic, organization, and critical method. Just as important, the prospectus should present a line of inquiry that promises to contribute to human knowledge - a thesis, or a position that warrants defending by means of both critical analysis and empirical evidence.

### **Research and Dissertation**

Doctoral students register in 9090 (Research) once they have passed their PhD examinations. They will need to enroll for a minimum of 2 credit hours of 9090 during the fall and spring semesters and 1 hour during the summer semester in order to complete the 12 hours of dissertation credits required for graduation. In addition, the program for the doctoral degree must be completed within five years of passing the comprehensive examination. Individual departments or area

programs may stipulate a shorter time period. Doctoral students should complete all requirements for the degree, including the dissertation, within five years of passing the comprehensive examination. The Graduate School extends this deadline in extenuating circumstances. Nonetheless, students must request additional time in writing from the director of graduate studies. Failure to show sufficient progress on the dissertation may result in dismissal from the graduate program. Students should obtain the Graduate School's guidelines for thesis/dissertation writing since the dissertation must conform to the formatting and style specifications established by the Graduate School.

### **Defense**

Candidates and their directors schedule a formal defense of a dissertation after its acceptance by all members of the doctoral committee. This oral defense, conducted by members of the doctoral committee, is open to the public. For additional information, contact the Director of Graduate Studies in the Department of Romance Languages and Literatures.

## Russian

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Tim Langen, Chair  
College of Arts and Science  
451 Strickland Hall  
(573) 882-4328  
grs@missouri.edu

The Department of German and Russian Studies offers courses in German and Russian language, literature, film and civilization. It also offers instruction in Arabic, Chinese, Japanese, Hebrew and Korean. Many courses, such as civilization, culture, literature in translation and film courses, do not require knowledge of a foreign language.

The department offers the Bachelor of Arts with majors in German and in Russian, and the Master of Arts in German and in Russian and Slavonic Studies. The department also offers minors in German and in Russian. Many courses in the minor in East Asian Studies are taught in the Department of German and Russian Studies. The Film Studies program is also housed in the department.

## Faculty

**Professor** G. Barabtarlo\*  
**Associate Professor** T. Langen\*  
**Assistant Professor** M. Kelly\*  
**Associate Teaching Professor** N. Monnier\*

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 282)
- BA in Russian (p. 283)
- Minor in Russian (p. 283)

## Dual Degrees and Double Majors

As a double major or a dual degree has become an ever more popular choice, an increasing number of students choose German or Russian as one of their majors. Students looking forward to a career in medicine or in the sciences use a double major to ensure a thorough background in the humanities to balance their scientific studies. Double majors within the College of Arts and Science can be arranged and, if the second degree program is identified early, dual degree programs outside the college are also possible. Combined programs with journalism, international studies, education and business are frequent choices. Within the college, combinations with political science, history, philosophy, art history, and the sciences are popular double major programs.

## Graduate

College of Arts and Science  
451 Strickland Hall  
573-882-4328

<http://grs.missouri.edu/degprogs/russianguardstudies.html>

**Director of Graduate Studies:** Gene Barabtarlo

- MA in Russian and Slavonic Studies (p. 284)

The Master of Arts program in Russian and Slavonic Studies offers advanced study in the literature and culture of Russia. Course offerings are primarily in literature, but reflect a variety of interrelated fields, including religion, philology, intellectual history, and philosophy. In two years of coursework students receive training in the theory and history of Russian literature and culture in general, as well as an introduction to the history of the language.

## Careers

Students may go on to careers in a number of fields, including government work and international business; they will also be prepared to continue their studies at the doctoral level.

## Facilities and Resources

The library of the University of Missouri is particularly strong in Russian history and literature. We are also part of a consortium that provides quick access to the holdings of many other major academic and public libraries.

## Financial Support

In this program, qualified graduate students may have the opportunity to work as teaching assistants in language, literature or civilization courses. Incoming graduate students are normally offered paid positions as Teaching Assistants. To be eligible for a teaching assistantship, your application must be received by March 1. Teaching assistants (TAs) are normally appointed for one academic year (two semesters / nine months). The Fall Semester runs from late August to mid-December; the Spring Semester from mid-January to mid-May. TA appointments are normally renewed for the second year of study when teaching and progress toward the degree are satisfactory. Appointments after the second year may be available in special cases, depending upon departmental needs and resources. At present the TA position provides a stipend of approximately \$1,000 per month. In addition, fees for courses taken toward the MA are waived for TAs. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details. The Graduate School offers several valuable fellowships for which the department may nominate incoming students.

## Undergraduate

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### Department Level Requirements - Russian

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### Departmental Honors - Russian

Departmental honors are available for students majoring in Russian with a minimum 3.3 GPA. A three-course literature sequence must be completed with no grades below B or, at the discretion of the department, a thesis paper may be written.

Beginning Fall 2013: Departmental Honors are available for student majoring in Russian with a minimum 3.5 GPA in the Russian major and 3.3 GPA overall. Students must complete a minimum of three literature

courses, two of which must be at the 4000 level, with no grades below a B. At the discretion of the department, students may write a thesis paper in lieu of one of the 4000 level literature courses.

## BA in Russian

### Major Program Requirements

The major in Russian consists of 27 credits in Russian beyond RUSS 1200. Within these 27 hours, students must meet minimum requirements within three categories: language, literature, and culture (see below).

The Russian faculty strongly encourages all majors to spend at least one semester (or summer) studying abroad, preferably after their second year of the language. In addition, students must meet all degree, college and university graduation requirements, including those for university general education (p. 18).

Major core requirements (beyond the A&S language requirement)

The following courses or their equivalents must be included:

RUSS 2130	Second-Year Russian I	4
RUSS 2160	Second-Year Russian II	4
RUSS 3130	Intermediate Russian	3
or RUSS 3160	Intermediate Conversation and Composition	

Two of the following seven courses: 6

RUSS 2100	Classics and Iconoclasts: An Introduction to Russian Literature	
RUSS 3310	Heroes of Their Times: Individualism in Russian Literature	
RUSS 3320	Matters of Life and Death: The Fiction of Tolstoy and Dostoevsky	
RUSS 3330	Decline, Fall, and Resurrection in Modern Russian Literature	
RUSS 3350	The Split Tree of Russian Literature: Contemporary Russian Prose	
RUSS 3380	Sinners, Saints, and Madmen: 19th Century Russian Literature	
RUSS 3390	True Fictions: Russian Prose since 1900	

One 4000-level literature course 3

RUSS 2310 Between Heaven and Earth: Russian Civilization \* 3

or RUSS 2320 The Arts of Survival: Civilization in Soviet Times

Electives

Elective courses and equivalents to replace the required courses above should be selected in consultation with the advisor

Total Credits 23

\* Both RUSS 2310 and RUSS 2320 are Writing Intensive Russian civilization courses.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
RUSS 1100	6	RUSS 1200	6

HIST 1100	3	Course for second major / minor	3
ENGLISH 1000	3	MATH 1100	3
Foundation Requirements (humanities)	3	Foundation Requirements (behavioral Sciences)	3
	15		15
Second Year			
Fall	Credits	Spring	Credits
RUSS 2130	4	RUSS 2160	4
RUSS 2310	3	RUSS 3320	3
Course for second major / minor	3	Course for second major / minor	3
Foundation Requirements (sciences, Math Reasoning Proficiency)	3	Foundation Requirements (humanities)	3
Foundation Requirements (social science)	3	Foundation Requirements (sciences)	3
	16		16
Third Year			
Fall	Credits	Spring	Credits
RUSS 3130	3	RUSS 3630	3
RUSS 3310	3	Foundation Requirements(science with lab)	5
Foundation Requirements (humanities)	3	Foundation Requirements(behavioral sciences)	4
Course for second major / minor	3	Course for second major /minor / elective	3
Course for second major / minor	3		
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
RUSS 3890	3	4000-level Russian literature course	3
4000-level Russian literature/culture course	3	Capstone course for second major / elective	3
Foundation Requirements (humanities)	3	Foundation Requirements (social sciences)	3
Second major/ minor / elective	3	Second major/ minor / elective	3
Second major/ minor / elective	3	Second major/ minor / elective	3
	15		15
Total Credits: 122			

### Minor in Russian

The department offers a minor in Russian, consisting of 15 credits beyond RUSS 1200. A minimum of 6 of these 15 credits must be in Russian courses numbered 3000 or above. In addition, a minimum of 9 of the 15 credits must be completed in residence.

### Graduate

## MA in Russian and Slavonic Studies

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### Admission Contact Information

Professor Gene Barabtarlo Send email to Dr. Barabtarlo:  
barabtarlog@missouri.edu  
451 Strickland Hall  
Columbia, MO 65211  
573-882-4328

### Admission Information

Before applying, please send an informal letter of intent or inquiry to Dr. Barabtarlo at either the physical address or e-mail address above.

### Admission Criteria

Fall deadline: March 1 (domestic); February 1 (international)

**Note:** to be eligible for a teaching assistantship, application must be received by March 1

Spring deadline: September 1 (domestic); May 1 (international)

Minimum GPA: 3.0 in last 60 hours

Undergraduate major or minor in Russian or equivalent

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Note: No language other than English and Russian is required for admission.

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Program:*

- 2 letters of recommendation

### Degree Requirements

Students must complete a minimum of 30 hours of graduate-level courses with a GPA of B or higher. In accordance with Graduate School policy, no fewer than 24 of these must be Russian and Slavonic Studies courses at the 7000 or 8000 level, with at least 12 at the 8000 level. In addition, students must demonstrate adequate language skills in English and Russian.

### Thesis

A master's thesis is optional.

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## Sociology

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J. Gubrium, Chair  
College of Arts and Science  
312 Middlebush Hall  
(573) 882-8331  
sociologyug@missouri.edu

Sociology is a discipline founded over 100 years ago to bring the scientific method to the study of human societies. It has pioneered in the development of methods and techniques designed to provide accurate and verifiable information about contemporary societies. It is the inventor of survey research and a host of statistical measures. The techniques created by sociologists are now used in all disciplines concerned with human behavior.

Sociologists today conduct research and reason from research findings to generate deeper understandings of how societies work. The generation of theoretical statements and the testing of those statements in a wide variety of social settings is the core of sociological work. Sociologists are knowledge builders, rather than change agents, although there is an emergent group of scholars who apply sociological knowledge to create changes in organizations, individuals and communities. Sociology contributes to human improvement by seeing that change can be based on credible information and reasoned understanding of how humans work together in groups or larger aggregates.

### Faculty

**Professor** E. E. Brent Jr.\*\*, J. Galliher\*\*, J. F. Gubrium\*, I. Pearce\*\*  
**Associate Professor** W. H. Brekhus\*\*, S. Brooks\*\*, J. M. Hermesen\*\*, V. L. Johnson\*\*, C. Y. Lo\*\*, A. Prasad\*\*  
**Assistant Professor** E. Bjornstrom\*\*, E. Brown\*\*, E. Morales\*\*, S. Prasad\*\*, J. Rodriguez\*, R. Scott\*\*  
**Professors Emeritus** B. Bank\*\*, J. K. Benson\*\*, B. Biddle\*\*, D. Granberg, P. Hall, R. M. Hessler\*\*, A. C. Twaddle\*\*, C. E. Vaughan, T. Vaughan

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 285)
- BA in Sociology (p. 285)
- Minor in Sociology (p. 287)

### Graduate

College of Arts and Science  
312 Middlebush Hall  
573-882-8331  
<http://sociology.missouri.edu/graduate/requirements.shtml>

**Director of Graduate Studies:** Clarence Lo

- MA in Sociology (p. 287)
- PhD in Sociology (p. 287)

### About the Program

The Department of Sociology engages students in research, utilizing qualitative and quantitative research methodologies, in order to analyze issues and problems affecting societies. The core of doctoral training is in classical and contemporary theory, and research methods including quantitative, historical, and feminist methodologies, and interviews and field work.

### Specializations

Students may focus their studies on any two of the following graduate program areas:

- Culture and Identity
- Deviance and Social Control
- Health, Aging, and Environment
- Political Economy, Power, and Movements
- Social Inequalities

Within these program areas, students conduct research on such topics as gender, health-care policy, popular culture, hunger, race, criminology, sexualities, and elites and protest movements in the global economy.

### Financial Aid from the Program

Financial support for students includes teaching and research assistantships, both of which include remission of educational fees. International students cannot be awarded teaching assistantships until they have completed one semester of residence at MU and pass a test of spoken English.

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## Undergraduate

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### Department Level Requirements - Sociology

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#### Departmental Honors

Students with a cumulative GPA of at least 3.3 are eligible for departmental honors in sociology. Qualified students who seek this option must write an honors thesis under the supervision of a sociology faculty member. Students who take the honors thesis option are not required to take SOCIOL 4970 (p. 285). Students enroll in SOCIOL 4995 (p. 285) for 3 credits *each semester* of the senior year for a total of 6 credits.

### BA in Sociology

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#### Major Program Requirements

A Bachelor of Arts with a major in Sociology consists of 30 credits organized to provide progressively more sophisticated levels of sociological analysis culminating in a capstone experience. It is expected that students start with entry courses, progress to basic courses and then to upper-level electives. In addition, students must complete all degree, College of Arts and Sciences and University graduation requirements, including University General Education.

**Major core requirements**
**Entry courses**

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 2200	Social Inequalities	3

**Basic courses**

SOCIOL 2950	Social Research I	3
SOCIOL 3100	Recent Theories in Sociology (prerequisite: SOCIOL 2200)	3

**Post-basic courses**

Three additional sociology courses numbered 3000 or above; may include no more than 3 credits in SOCIOL 4940, SOCIOL 4942, or SOCIOL 4960	9
Additional hours in sociology	6
An additional 6 credits in elective coursework in the major	

**Capstone course**

SOCIOL 4970	Senior Seminar	3
Should be taken in the last semester of undergraduate work		

**Departmental honors**

SOCIOL 4995	Honors in Sociology (1st semester of senior year)	3
SOCIOL 4995	Honors in Sociology (2nd semester of senior year)	3

Students with a cumulative GPA of at least 3.3 are eligible for departmental honors in sociology. Qualified students who seek this option must write an honors thesis under the supervision of a sociology faculty member. Students who take the honors thesis option are not required to take SOCIOL 4970. Students enroll in SOCIOL 4995 for 3 credits each semester of the senior year.

**Statistics**

A course in statistics is not required for the major. However, such a course is highly recommended, especially for students considering graduate or professional school.

**Suggested courses:**

STAT 1200	Introductory Statistical Reasoning	
STAT 1300	Elementary Statistics	
SOCIOL 4120	Social Statistics	

**Total Credits** 30

**Optional Tracks**

The course work in sociology fits into five recommended tracks of study. Although sociology majors are *not required* to select a track, students who want a closer tie between the major and future employment are encouraged to do so. Each track has recommended courses in the major, complementary internships, and service learning opportunities. (Note: Tracks are not listed on transcripts or diplomas.) These tracks are outlined below.

**Track: Law, Justice and Society**

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 1650	Social Deviance	3
SOCIOL 3010	Social Problems	3
SOCIOL 3600	Criminology	3
SOCIOL 4500	Sociology of Social Policy	3
SOCIOL 4600	Contemporary Corrections	3
SOCIOL 4610	Society and Social Control	3

**Track: Power, Inequalities and Social Change**

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 2210	The Black Americans	3
SOCIOL 3200	Class, Status, and Power	3
SOCIOL 3210	Sociology of Globalization	3
SOCIOL 3320	Sociology of Gender	3
SOCIOL 3510	Public Opinion and Communication	3
SOCIOL 3520	Collective Behavior	3
SOCIOL 4220	Race and Ethnic Relations	3
SOCIOL 4230	Women, Development, and Globalization	3

**Track: Sexuality, Health and the Life Course**

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 1360	The Female Experience: Body, Identity, Culture	3
SOCIOL 2230	Social Perspectives on Aging	3
SOCIOL 3010	Social Problems	3
SOCIOL 3300	Queer Theories/Identities	3
SOCIOL 3320	Sociology of Gender	3
SOCIOL 3420	The Family	3
SOCIOL 3460	Technology and Society	3
SOCIOL 3440	Sociology of Health	3
SOCIOL 4210	Sociology of Aging	3
WGST 4420	Studies in Gender, Culture, and Politics	3

**Track: Culture, Identity and the Media**

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 2300	Self and Society	3
SOCIOL 2310	Culture and Mass Media	3
SOCIOL 3300	Queer Theories/Identities	3
SOCIOL 3310	Social Psychology	3
SOCIOL 3400	Politics of the Media	3
SOCIOL 3430	The Sociology of Sport	3
SOCIOL 3450	The Sociology of Religion	3
SOCIOL 3510	Public Opinion and Communication	3
SOCIOL 4320	Culture, Identity and Interaction	3

**Track: Organizations, Work, Technology and the Economy**

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 3200	Class, Status, and Power	3
SOCIOL 3210	Sociology of Globalization	3
SOCIOL 3460	Technology and Society	3
SOCIOL 3520	Collective Behavior	3
SOCIOL 3700	Organizations and Institutions	3
SOCIOL 3710	The Sociology of Work	3
SOCIOL 4230	Women, Development, and Globalization	3

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
SOCIOL 1000	3	SOCIOL 2200	3
ENGLISH 1000	3	MATH 1100	3
Humanities Elective	3	Humanities Elective	3
Social Science Elective (Missouri State Law Requirement)	3	Social Science Elective	3
Science Elective	3	Science Elective with Lab	4
	15		16
Second Year			
Fall	Credits	Spring	Credits
SOCIOL 1650	3	SOCIOL 2950	3
Foreign Language level 1	3	SOCIOL 3600	3
Humanities Elective	5	Foreign Language level 2	5
Social Science Elective (upper level)	3	Humanities Elective (upper level)	3
Math/Proficiency Elective (preferably Statistics)	3	Behavioral Science Elective	3
	17		17
Third Year			
Fall	Credits	Spring	Credits
SOCIOL 3200	3	SOCIOL 3100	3
Foreign Language level 3	3	Elective - upper level	3
Behavioral Science Elective (upper level)	3	Elective - upper level	3
Writing Intensive Elective	3	Elective	3
Elective	3	Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
SOCIOL 3010	3	SOCIOL 4970	3
Elective - upper level	3	SOCIOL 4600	3
Elective - upper level	3	Elective	3
Elective	3	Elective	3
Elective	3	Elective	3
	15		15
Total Credits: 125			

## Minor in Sociology

To minor in sociology, a student must complete a total of 15 credits of sociology coursework as follows:

SOCIOL 1000	Introduction to Sociology	3
SOCIOL 2200	Social Inequalities	3
Two courses at the 3000-level or above		6
One other sociology course at any level		3
Total Credits		15

At least nine credit hours for the minor must be from MU courses.

## Graduate

### MA in Sociology

#### About the Master of Arts in Sociology

At this time, our Department is not admitting students who are seeking a terminal master's degree. However, our doctoral students earn an MA degree en route to the PhD.

Please see the admission criteria for our doctoral degree program (p. 287).

### PhD in Sociology

#### Admission Contact Information

Graduate Admissions Coordinator (oakesm@missouri.edu)  
 312 Middlebush Hall  
 Columbia, MO 65211  
 573-882-8331

#### Admission Criteria

Fall deadline: January 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE score: case-by-case
- 15 hours of undergraduate sociology with a grade of B or better, including one course in sociological theory and a basic statistics course

#### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Sociology Program: <http://sociology.missouri.edu/graduate/admission.shtml>

- GRE score report
- Departmental application
- 3 letters of recommendation
- Statement of research interests
- Copy of Graduate School application (needs to be printed out when done online)
- Copies of transcripts (it is helpful to have unofficial copies sent to the department)
- One page Application for Financial Support
- Research paper, master's thesis, senior thesis, or term paper

#### PhD Plan of Study

The PhD program requires a minimum of 30 hours of course work, including 8100 and two additional seminars in sociological theory (SOCIOL 9187 and SOCIOL 9487) and SOCIOL 8120, SOCIOL 7120 (or its equivalent), SOCIOL 8130, and two seminars in sociological research methods (SOCIOL 7110, SOCIOL 8187, SOCIOL 9287, SOCIOL 9288,

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SOCIOL 9687, or SOCIOL 9837), plus six courses targeted to the student's specialty interests.

## **Exams and Research**

All students are required to submit a research paper no later than their fourth semester of residence. Students with a Master's Thesis in sociology can fulfill this requirement as early as their first semester. At least eight months before the date on which they expect to complete the degree, candidates must pass a comprehensive examination centered on two of the five graduate program areas. Students must prepare and successfully defend a dissertation that makes an original contribution to the discipline.



## Statistics

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Dongchu Sun, Chair  
College of Arts and Science  
146 Middlebush Hall  
(573) 882-6376  
[www.stat.missouri.edu](http://www.stat.missouri.edu)  
[dooleyj@missouri.edu](mailto:dooleyj@missouri.edu)

Information is needed to solve the many problems of today's world. How much information? What kind? After it is obtained, what must be done with it? Statisticians are trained to help answer these questions. Early admission into the Statistics Department will allow students to plan their programs so that the math and statistics prerequisites can be taken in the most efficient sequence.

The department offers BA, BS, MA and PhD degrees with a major in Statistics. A minor is also available.

## Faculty

**Professor** N. Flournoy\*\*, Z. He\*\*, P. L. Speckman\*\*, D. Sun\*\*, J. Sun\*\*, C. K. Wikle\*\*

**Associate Professor** S. Chakraborty\*\*, M. A. Ferreira\*\*, S. Holan\*\*, A. Micheas\*\*, J. Qiu\*\*, L. A. Thombs\*\*

**Assistant Professor** S. Guha\*\*, T. Ji\*, M. Robbins\*

**Associate Teaching Professor** L. D. Ries\*

**Assistant Teaching Professor** J. Fresen\*, L. B. Hearne\*, S. Lee\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 290)
- BA in Statistics (p. 290)
- BS in Statistics (p. 291)
- Minor in Statistics (p. 292)

## Graduate

Kathleen Maurer, Coordinator of Graduate Studies  
146 Middlebush  
Columbia, MO 65211  
573-882-6376  
<http://www.stat.missouri.edu/>

**Director of Graduate Studies:** Paul Speckman

- MA in Statistics (p. 292)
  - with emphasis in Biostatistics (<http://catalog.missouri.edu/undergraduategraduate/collegeofartsandscience/statistics/ma-statistics-emphasis-biostatistics>)
- PhD in Statistics (p. 293)
- Graduate Minor in Statistics (p. 295)

## About Statistics

The statistics department faculty is known for both cutting edge methodological and collaborative research and for outstanding teaching. Faculty members are currently investigating statistical problems in the fields of ecology, genetics, economics, meteorology, wildlife management, epidemiology, AIDS research, geophysics, and climatology. The program's faculty members have ongoing collaborative programs across disciplines such as biostatistics, bioinformatics, economics, atmospheric science, psychology and with the Missouri Department of Conservation.

The graduate program provides opportunities for graduate study and thesis direction in various areas of probability and statistics, both theoretical and applied. A variety of consulting and collaborative opportunities allow both faculty and graduate students to conduct cooperative and interdisciplinary research. Regular statistics colloquia provide opportunities for faculty and outside speakers to present the results of their research. Faculty and graduate students also participate in weekly seminar series in Bayesian statistics, bioinformatics, and biostatistics.

## Dual Master's Degree in Economics and Statistics

The department offers a cooperative MA degree with the Economics Department. Students may obtain MA degrees in economics and statistics with 48 hours of course work numbered 7000 or higher from the University of Missouri instead of the 52 or more required for separate degrees. (These 48 hours may not include any of the following: Economics 7351, 7353, or Statistics 7510, 7530, 7710.) Eighteen or more hours are required from the Department of Economics. At least 15 hours must be numbered 8000 or higher with no more than four hours of 8090. Students must take the core economics courses 8451 and 8453 and research workshop 8413 (2 credit hours). Eighteen or more hours are required from the Department of Statistics. At least 15 hours must be numbered 8000 or higher with no more than three hours of 8090. Statistics 7750 and 7760 and Mathematics 7140 are required if equivalent courses were not taken as an undergraduate.

All candidates must submit a thesis or written project demonstrating an independent effort towards producing original work satisfactory for each degree. The candidate may complete separate theses/projects for both economics and statistics or a single joint thesis/project satisfying both requirements.

## Career Opportunities

Statisticians are in demand in education, medicine, government, business and industry as well as in the biological, social and physical sciences.

## Facilities & Resources

The Department of Statistics maintains a state-of-the-art computer network with Linux workstations and servers for research and personal productivity software on PCs. Students have access to the network through PCs in student offices and through the statistics department computer laboratory. An extensive library of software including R, SAS, and common programming languages is maintained. Students also have access to the campus computing network. The statistics department is located in newly renovated space in Middlebush, with easy access to the main library's outstanding collection of books and journals in statistics.

## Financial Aid from the Program

Fellowships and teaching and research assistantships are available to qualified graduate students. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Undergraduate

### Department Level Requirements - Statistics

#### Credit for Beginning Courses

(Applies to all students and all majors)

- A student may not receive credit toward an undergraduate degree for more than one of STAT 1200, STAT 1300 and STAT 1400.
- A student may not receive credit toward an undergraduate degree for more than one of STAT 2500 and STAT 2530.
- Subject to the above restrictions, a student may receive a maximum of 4 credits toward an undergraduate degree for any combination of STAT 1200, STAT 1300, STAT 1400, STAT 2200, STAT 2500 and STAT 2530.
- A student may not receive credit toward an undergraduate degree for any statistics course numbered 2999 or below if a statistics course numbered 4000 or above was successfully completed prior to or concurrent with the course in question. Exceptions may be approved at the discretion of the department.

### Department Degree Requirements - Statistics

The Department of Statistics approves majors in statistics only for students who have met the following criteria:

- Completion of at least one statistics course at the 3000-level or above (or equivalent)
- Cumulative GPA of at least 2.50 overall
- Have earned a grade of C or higher in each statistics course completed

Students are encouraged to supplement their work in statistics with courses from areas such as economics, biology, accounting, finance, marketing, management, psychology, sociology, engineering, agriculture and atmospheric science. In addition, students must complete all degree, college and university graduation requirements (p. 17), including university general education (p. 18).

#### Options

Students may pursue either a BA or a BS degree. For both degrees, students may pursue either a traditional track or an applied track. Students who are interested in graduate study in statistics are strongly encouraged to follow the traditional track.

### Departmental Honors

To be admitted to the undergraduate honors program in the Department of Statistics, a student must have completed at least 12 of the 21 credits of statistics courses required for the major, have a grade-point average

of at least 3.25 in all completed statistics courses, and identify a faculty member from the department who agrees to supervise the student's honors research project.

In order to receive the departmental honors designation, students who have been accepted into the program must graduate with a grade-point average of at least 3.25 in statistics courses, prepare a senior thesis based on their honors project, and present the results of the thesis in a departmental colloquium or other public forum approved by their mentor. They also must earn a grade of "B" or better in 3 credits of STAT 4999.

## BA in Statistics

### Major Program Requirements

Students must complete the university general education (p. 18) requirements and the Department Level Requirements (p. 290), in addition to the degree requirements below.

#### Mathematics courses

##### Traditional track

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4140	Matrix Theory	3

##### Applied track

MATH 1500	Analytic Geometry and Calculus I	5-6
or MATH 1300	Finite Mathematics	
& MATH 1400	and Calculus for Social and Life Sciences I	

6 additional credits in statistics (beyond those used to fulfill the statistics requirements of the degree) or approved statistically-oriented courses; must be numbered 4000 or above and may not include STAT 4050 Connecting Statistics to Middle and Secondary Schools

#### Statistics Courses

##### Traditional Track

STAT 4970	Senior Seminar	3
STAT 4710	Introduction to Mathematical Statistics	3
or STAT 4750	Introduction to Probability Theory	

15 additional credits offered by the department, at least 12 of which must be numbered 3000 or above and may not include STAT 4050: Connecting Statistics to Middle and Secondary Schools or more than 3 credits of STAT 4999: Departmental Honors in Statistics

##### Applied Track

18 additional credits offered by the department, at least 15 of which must be numbered 3000 or above and may not include STAT 4050: Connecting Statistics to Middle and Secondary Schools or more than 3 credits of STAT 4999: Departmental Honors in Statistics

#### Computing Courses

##### Both tracks

CMP_SC 1040	Introduction to Problem Solving and Programming	3
or CMP_SC 1050	Algorithm Design and Programming I	

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1160 <sup>+</sup>	5	MATH 1500	5
ENGLISH 1000 <sup>+</sup>	3	CMP_SC 1040	3
Elective	3	Foreign Language II <sup>+</sup>	5
Foreign Language I <sup>+</sup>	5	American History or Government <sup>+</sup>	3
	16		16
Second Year			
Fall	Credits	Spring	Credits
MATH 1700	5	MATH 2300	3
STAT 2500	3	STAT 3500	3
Foreign Language III <sup>+</sup>	3	Behav Science Elective <sup>+</sup>	3
WI Elective	3	Hum/Fine Arts Elective <sup>+</sup>	3
		Soc Science Elective <sup>+</sup>	3
	14		15
Third Year			
Fall	Credits	Spring	Credits
MATH 4140	3	Behav Sci Elective <sup>+</sup>	3
Hum/Fine Arts Elective <sup>+</sup>	3	Hum/Fine Arts Elective <sup>+</sup>	3
Soc Science Elective <sup>+</sup>	3	STAT 4530	3
STAT 4510	3	STAT 4110	3
Elective	3	Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
STAT 4750	3	STAT 4760	3
Hum/Fine Arts elective	3	STAT 4970 <sup>+</sup>	3
Electives	9	Electives	8
	15		14
Total Credits: 120			

\* Courses used as area in lieu of foreign language

+ Course meets University General Education and/or campus requirements

## BS in Statistics

### Major Program Requirements

Students must complete the university general education (p. 18) requirements and Department Level Requirements (p. 290) in addition to the degree requirements below.

#### Mathematics courses

##### Traditional track

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4140	Matrix Theory	3

##### Applied track

MATH 1500	Analytic Geometry and Calculus I	5-6
or MATH 1300 & MATH 1400	Finite Mathematics and Calculus for Social and Life Sciences I	

6 additional credits in statistics courses (beyond those used to fulfill the statistics requirements of the degree) or approved statistically-oriented courses; must be numbered 4000 or above

#### Statistics courses

##### Traditional Track

STAT 4970	Senior Seminar	3
STAT 4710	Introduction to Mathematical Statistics	3
or STAT 4750	Introduction to Probability Theory	

15 additional credits offered by the department, at least 12 of which must be numbered 3000 or above and may not include STAT 4050: Connecting Statistics to Middle and Secondary Schools or more than 3 credits of STAT 4999: Departmental Honors in Statistics

##### Applied Track

18 additional credits offered by the department, at least 15 of which must be numbered 3000 or above and may not include STAT 4050: Connecting Statistics to Middle and Secondary Schools or more than 3 credits of STAT 4999: Departmental Honors in Statistics

#### Computing courses

##### Both tracks

CMP_SC 1040	Introduction to Problem Solving and Programming	3
or CMP_SC 1050	Algorithm Design and Programming I	

AND 3 additional credits in computer science or other approved computing courses (STAT 4110: Statistical Software and Data Analysis may be used as part of this requirement if it is not counted in statistics group above.)

#### Professional writing courses

ENGLISH 2030	Professional Writing	3
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## Foreign Language Option for Students Pursuing a BS Degree

Students pursuing the BS degree may elect to take an alternative to a foreign language. Such students must complete no fewer than 12 upper-class credits that are not from the parent department, are not normally required of departmental majors and do not appear elsewhere in the graduation plan. This program must be carefully planned to form a coherent unit and must be approved by the director of undergraduate studies.

The following are examples of foreign language alternatives:

- mathematical sciences
- biological sciences
- behavioral sciences
- physical sciences
- business

- engineering
- economics

## Semester Plan

First Year			
Fall	Credits	Spring	Credits
MATH 1160 <sup>+</sup>	5	MATH 1500	5
ENGLISH 1000 <sup>+</sup>	3	CMP_SC 1040	3
Hum/Fine Arts Elective <sup>+</sup>	3	Soc/Behav Science Elec <sup>+</sup>	3
American History of Government <sup>+</sup>	3	Bio/Phys Science lab <sup>+</sup>	5
Elective	3		
	17		16
Second Year			
Fall	Credits	Spring	Credits
MATH 1700	5	MATH 2300	3
STAT 2500	3	STAT 3500	3
ENGLISH 2030	3	Hum/Fine Arts Elective <sup>+</sup>	3
Hum/Fine Arts Elective <sup>+</sup>	3	WI Elective <sup>+</sup>	3
Elective	3	Elective	3
	17		15
Third Year			
Fall	Credits	Spring	Credits
MATH 4140	3	STAT 4530	3
STAT 4510	3	STAT 4110	3
Elective	6	Soc/Behav Science Elective <sup>*</sup>	3
Foreign Language Substitute <sup>*</sup>	3	Foreign Language Substitute <sup>*</sup>	3
		Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
STAT 4750	3	STAT 4760	3
Electives	8	STAT 4970 <sup>+</sup>	3
Foreign Language Substitute <sup>*</sup>	3	Electives	4
	14		10
Total Credits: 119			

\* Course used as area in lieu of foreign language

+ Course meets University General Education and/or campus requirements

## Minor in Statistics

A minor in statistics requires a minimum of 15 credits in statistics courses numbered 3000 or above. The courses used to complete the minor must be chosen in consultation with the director of undergraduate studies and must include at least one of the following:

STAT 3500	Introduction to Probability and Statistics II	3
STAT 4710	Introduction to Mathematical Statistics	3

STAT 4750	Introduction to Probability Theory	3
A maximum of 3 of the 15 credits may be in:		
STAT 4002	Topics in Statistics-Biological/Physical/Mathematics	1-99
or STAT 4085	Problems in Statistics for Undergraduates	

## Graduate

### MA in Statistics

#### Admission Criteria

Fall deadline: January 15  
Spring deadline: October 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
74	535

- Minimum GPA: 3.0 in math and statistics courses to enter master's program
- Bachelor's degree from accredited college or university in related area

Undergraduate courses in statistics are recommended but not required. Consideration also is given to rank in graduating class, trends in grade records, maturity and experience, and other criteria bearing on qualifications.

Before entering the graduate program, a student should have a background that includes three semesters of calculus (or equivalent), one semester of matrix theory, and at least one post-calculus course in probability and statistics. Some required courses at the 7000 level not taken as an undergraduate may be taken for graduate credit as part of the graduate program.

#### Required Application Materials

##### To the Graduate School:

- All required Graduate School documents

##### To the Program:

- Departmental application
- 3 letters of recommendation (use departmental form)
- Letter of intent
- GRE score report

#### Degree Completion Requirements

The general requirements for receiving a master's degree are at least 30 semester hours of course work at the 7000 level or higher, of which at least 18 hours must be from the Department of Statistics at MU. The 30 hours may not include credit hours of

STAT 7050	Connecting Statistics to Middle and Secondary Schools	3
STAT 7510	Applied Statistical Models I	3
STAT 7530	Analysis of Variance	3
STAT 7710	Introduction to Mathematical Statistics	3
STAT 8090	Master's Thesis Research in Statistics (more than 1-99 a total of six hours of)	

At least 15 semester hours of course work at the 8000 level or above must be taken from the Department of Statistics at MU. The 15 semester hours cannot include more than a total of three hours of STAT 8090.

Additional courses recommended but not required are:

STAT 7110	Statistical Software and Data Analysis	3
STAT 7310	Sampling Techniques	3
STAT 7410	Biostatistics	3
STAT 7420	Applied Survival Analysis	3
STAT 7430	Applied Longitudinal Data Analysis	3
STAT 7450	Applied Statistical Methods for Bioinformatics	3
STAT 7610	Applied Spatial Statistics	3
STAT 7810	Nonparametric Methods	3
STAT 7830	Categorical Data Analysis	3
STAT 7850	Introduction to Stochastic Processes	3
STAT 7870	Time Series Analysis	3
STAT 8310	Data Analysis I	3
STAT 8320	Data Analysis II	3
STAT 8370	Statistical Consulting	3
STAT 8410	Statistical Theory of Bioinformatics	3
STAT 8640	Bayesian Analysis I	3
STAT 9250	Statistical Computation and Simulation	3
STAT 9310	Theory of Linear Models	3
STAT 9320	Advanced Linear Models	3
STAT 9410	Survival Analysis	3
MATH 7700	Advanced Calculus of One Real Variable I	3
CMP_SC 1050	Algorithm Design and Programming I	3
or CMP_SC 2050	Algorithm Design and Programming II	3

## Remedial Courses

The following courses are required if equivalent courses were not taken as an undergraduate: MATH 7140, STAT 7750 and STAT 7760. These courses may not be used for more than six of the required 30 hours.

## Applied Track Masters of Arts Degree

### Required core courses

Students must complete the following six courses or equivalent.

STAT 7110	Statistical Software and Data Analysis	3
STAT 7540	Experimental Design	3
STAT 7750	Introduction to Probability Theory	3
STAT 7760	Statistical Inference	3
STAT 8310	Data Analysis I	3
STAT 8320	Data Analysis II	3

In addition, students must take four elective courses, at least three of which must be selected from the department of statistics course offerings numbered 8000 or above.

### Examination

Students in the applied track must pass written and oral master's exams administered by a departmental committee.

## Regular Track Masters of Arts Degree

### Original Written Work

All candidates must submit a written report on an independent effort toward producing original work. This report may, with the adviser's consent, take the form of a thesis, a written review on a set of papers in statistics, or a written report on an independent study project, which may include an original application of statistics. For this work, a student must register for at least three semester hours of STAT 8090.

### Presenting the Work

All candidates are required to present an open seminar on the results of the written report. The report should be made available for public review, through the Department of Statistics office, for at least one week before the examination.

### Examination

The MA examination covers material presented in the written report and the seminar and may also cover course work.

## Satisfactory Progress

### Length of Study

A master's candidate is expected to complete the master's degree within three calendar years beginning with the first semester of enrollment unless approval is obtained from the graduate faculty of the Department of Statistics.

### Grade Requirements

Any student, while a graduate student in this program, who receives a grade of C or lower in six or more hours of courses offered by the Department of Statistics or a grade of C or lower in nine or more hours of all courses taken will be dismissed from the graduate program unless contrary action is taken by the graduate faculty of the department.

For each credit hour over three hours with a grade of C or lower in courses offered by the Department of Statistics at the 7000 level and above, the student must receive a credit hour with a grade of A in courses offered by the department at the 7000 level and above.

## PhD in Statistics

### Admission Criteria

Fall deadline: January 15  
Spring deadline: October 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
74	535

- Minimum GPA: 3.5 in math and statistics to enter PhD program
- Master's degree from accredited college or university in related area

Before entering the graduate program, a student should have a background that includes three semesters of calculus (or equivalent), one semester of matrix theory, and at least one post-calculus course in probability and statistics. Some required courses at the 7000 level not taken as an undergraduate may be taken for graduate credit as part of the graduate program.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Program:

- Departmental application
- 3 letters of recommendation (use departmental form)
- Letter of intent
- GRE score report

## Qualifying Examination

The Qualifying exam will be offered to students in the statistics department doctoral program or to master's students in statistics who are approved by the Admissions Committee. All graduate students who expect to be in the PhD program must take the qualifying exam at the earliest possible time after completing the courses required for the exam. Any exceptions to these time limits must be obtained in writing from the Director of Graduate Studies with approval from the voting faculty. The qualifying exam will be offered two times per year, once at the beginning of the Fall semester (August) and once at the beginning of the Spring semester (January). The exam will consist of two parts, to be given on separate days. Each part will be designed to be completed within a four-hour period. Part I will cover STAT 7750 Introduction to Probability Theory and STAT 7760 Statistical Inference. Part II will cover STAT 8310 Data Analysis I and STAT 8320 Data Analysis II. Students who fail a part of the qualifying exam on the first try must take that part of the exam again the next time the exam is offered if they choose to continue in the PhD program. On the second attempt, students are expected to take only the parts of the exam that they failed on the first attempt. In general, a student may attempt all or part of the exam at most two times. In rare and special situations, a student may appeal to the Director of Graduate Studies for a third attempt and be given the opportunity with approval from the voting faculty.

## Doctoral Committee

Within one semester of passing the qualifying examination, a student must choose a doctoral program committee in consultation with his or her adviser. This committee consists of at least five members, at least three of whom are members of the doctoral faculty in statistics and at least one from another MU doctoral program.

## Preliminary Examination

Before taking the preliminary exam, the student is required to have passed the qualifying exams and chosen his/her major professor. Students must take the preliminary exam at the earliest possible time after the student has passed the qualifying exam and completed the courses required for the preliminary exam. Any exceptions to these time limits must be obtained in writing from the Director of Graduate Studies with approval from the voting faculty. The preliminary exam will be offered two times per year, once at the beginning of the Fall semester (August) and once at the beginning of the Spring semester (January). The exam will consist of two parts, to be given on separate days. Part I will cover STAT 9710 Mathematical Statistics I and STAT 9720 Mathematical Statistics II, and part II will cover STAT 9310 Theory of Linear Models. Part I will be designed to be completed in four hours and Part II will be designed to be completed in three hours. Students who fail a part of the preliminary exam on the first try must take that part of the exam again the next time the exam is offered if they choose to continue in the PhD

program. On the second attempt, students are expected to take only the parts of the exam that they failed on the first attempt. In general, a student may attempt all or part of the exam at most two times. However, if it is the student's second attempt and the student fails one or both parts of the exam, the voting faculty may, upon consideration of the exam performance and other information deemed relevant, vote that the student be allowed to take the failed portion(s) of the exam a third (and final) time.

## Grading and Evaluating of the Qualifying and Preliminary Examinations

A "blinded" approach will be used when grading and evaluating the qualifying and preliminary examinations. Specifically, each student taking the exam will be given a unique ID that will be used throughout the entire grading and evaluating process. Each blinded part of the exam will be evaluated individually as pass or fail. The blinded method of evaluation will be strictly adhered to. That is, no conditional passes/fails will be given and no information other than the performance on the exam will be used to determine a pass or fail on each part of the examination.

## Required Course Work

Before taking the comprehensive examination, students should complete six courses taken at MU or at comparable institutions.

Select six of the following:

STAT 9100	Recent Developments in Statistics
STAT 9250	Statistical Computation and Simulation
STAT 9320	Advanced Linear Models
STAT 9370	Multivariate Analysis
STAT 9410	Survival Analysis
STAT 9510	Theory of Nonparametric Statistics
STAT 9530	Data Mining and Machine Learning Methods
STAT 9640	Bayesian Analysis II
STAT 9810	Advanced Probability
STAT 9820	Stochastic Processes

(Different 9100s can be counted more than once.) Other courses may be substituted at the discretion of the student's doctoral program committee.

## Comprehensive Examination

After successfully completing the preliminary exam and the required coursework, the student is eligible to take the comprehensive examination. This examination consists of a written and oral section as specified in the Graduate School catalog. This examination must be completed at least seven months prior to the final defense of the dissertation.

## Dissertation

A dissertation, prepared under the direction of a dissertation supervisor, is required. The dissertation should be presented in an open seminar as part of the final examination, which is to be conducted by the final examination committee. The dissertation should be made available for public review, through the Department of Statistics office, for at least one week before the examination.

## Additional Requirements

Additional requirements for the PhD in statistics are determined by the student's program committee and the director of graduate studies.

## Graduate Minor in Statistics

### Master's Minor

To receive a designated minor in statistics for a master's degree, at least 12 credit hours of course work at the 7000 level or higher must be completed from the Department of Statistics at MU. The courses should be unified in theme and must be approved by the Director of Graduate Studies of the Department of Statistics.

The courses must be completed with an average grade of B (3.0) or higher.

The courses may not include:

STAT 7002	Topics in Statistics-Biological/Physical/Mathematics
STAT 7070	Statistical Methods for Research
STAT 7085	Problems in Statistics for Non-majors
STAT 8085	Problems in Statistics for Majors - Masters
STAT 9085	Problems in Statistics for Majors - PhD

The courses may not include more than one course from:

STAT 7710	Introduction to Mathematical Statistics
STAT 7750	Introduction to Probability Theory

### PhD Minor

To receive a designated minor in statistics for a PhD degree, at least 15 credit hours of course work at the 7000 level or higher must be completed from the Department of Statistics at MU.

The courses must include:

STAT 8310	Data Analysis I
STAT 8320	Data Analysis II

But may not include:

STAT 7002	Topics in Statistics-Biological/Physical/Mathematics
STAT 7020	Statistical Methods in the Health Sciences
STAT 7050	Connecting Statistics to Middle and Secondary Schools
STAT 7070	Statistical Methods for Research
STAT 7085	Problems in Statistics for Non-majors
STAT 7510	Applied Statistical Models I
STAT 7530	Analysis of Variance
STAT 8085	Problems in Statistics for Majors - Masters
STAT 8090	Master's Thesis Research in Statistics
STAT 9085	Problems in Statistics for Majors - PhD

Students must have at least one course in calculus-based statistics and the equivalent of at least two courses in an applied statistics sequence. The calculus-based statistics requirement can be met by STAT 7710 or STAT 7760 or above, but no more than 6 hours of STAT 7710, STAT 7750, and STAT 7760 can be counted towards the 15 hours. The applied sequence requirement can be satisfied by either STAT 7510/STAT 8220 or STAT 8310/STAT 8320. At most one course from STAT 7510 and

STAT 8310 can be counted and at most one course from STAT 8220 and STAT 8320 can be counted towards the 15 hours.

The plan of study must be approved by the Director of Graduate Studies of the Statistics Department and be completed with an average grade of B (3.0) or higher. Each student is encouraged to seek approval of his/her plan of study as soon as possible.

## Theatre

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Clyde Ruffin, Chair  
College of Arts and Science  
Rhynsburger Theatre  
129 Fine Arts Center  
(573) 882-2021  
<http://theatre.missouri.edu>

The Department of Theatre offers students an appreciation of theatre as a fine art, sharpens the talents of those who seek careers in theatre and provides students with methods of stimulating and using their imagination and intensifying their communication skills.

The department offers BA, MA and PhD degrees with a major in Theatre. A minor is also available.

## Faculty

**Professor** S. Burgoyne, J. M. Miller, C. Ruffin, D. A. Crespy

**Associate Professor** C. D. Black, M. H. Carver

**Assistant Professor** K. Brown, B. Carlson

**Assistant Teaching Professor** J. A. Drtina, C. Gleason

**Associate Teaching Professor** K. S. Packard, R. D. Packard

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 297)
- BA in Theatre (p. 297)
  - with emphasis in Performance (p. 298)
  - with emphasis in Design/Technical (p. 297)
  - with emphasis in Writing for Performance (p. 298)
- Minor in Theatre (p. 298)

## Double Majors

Many students in theatre choose either a double major or a minor in another area. In either case, the student must see a theatre advisor for approval.

## Graduate

Theatre Graduate Programs  
College of Arts and Science  
129 Fine Arts Center  
573-882-2021  
<http://theatre.missouri.edu/>

**Director of Graduate Studies:** Heather Carver

- MA in Theatre (p. 299)
- PhD in Theatre (p. 300)

## About the Department of Theatre

The MU Department of Theatre has a distinguished history that began shortly after 1900 when a small group of aspiring thespians resolved to enhance the cultural life of the campus by producing plays in an abandoned dining room in Lathrop Hall. In 1925, Professor Donovan Rhynsburger joined the MU faculty and established the Missouri Workshop Theatre. For over 85 years, the department has sustained a national and international reputation as a major center for theatre and performance scholarship and dramatic art production. In 2007 "Academic Analytics" ranked MU Department of Theatre #4 nationally for scholarly productivity in Theatre Literature, History, and Criticism (reported in Chronicle of Higher Education, November 11, 2007). MU Theatre offers graduate and undergraduate programs.

A professional faculty comprises internationally recognized scholars and artists who develop the talents, skills and knowledge of students by teaching them to combine scholarship with artistry. MU has consistently produced fine theatre and notable alumni, including Tennessee Williams, George C. Scott, Tom Berenger, Chris Cooper, Jon Hamm, Ethel Pitts Walker, and Barbara Molette. MU students have won the prestigious David Library Award seven times, several nationally coveted awards like the Mark Twain Comedy Prize, and departmental productions have been cited for national awards by the Kennedy Center American College Theater Festival, the National Communication Association, and the Association of Theatre in Higher Education. Graduate students in the department have won numerous campus, professional and national awards, fellowships and research grants for their scholarship and artistry. The department is proud of its legacy of artistic excellence and the enrichment it brings to the cultural life of the campus and community.

## Facilities

Rhynsburger Theatre. Named after Donovan Rhynsburger, MU's principal theatre for dramatic productions is in the Fine Arts Building, which also houses the music and art departments. The 278-seat proscenium theatre has a large stage and fly system with well-equipped costume and scenic shops located adjacent to the stage. The theatre houses faculty offices, classrooms, shops, dressing rooms and other production support spaces. Students interested in lighting and sound production will find a variety of equipment and modern control systems on which to learn their craft. We're also thrilled to announce the addition of a new, state-of-the-art professional computer graphics lab in 2012.

Corner Playhouse. The Corner Playhouse provides an opportunity for students and faculty to present smaller, often more experimental productions in a flexible space. Seating up to 125, the theatre is designed to accommodate any stage configuration. Across the street from the Rhynsburger Theatre, the Corner Playhouse also houses dressing rooms, graduate student offices and classrooms.

## Satisfactory Progress: General Guidelines for MA and PhD in Theatre

### Probationary Status

The following constitute grounds for placing a student on departmental probation:

Earning a grade of C or below in any departmental course taken for graduate credit will result in probationary status. A grade of incomplete in any course will result in probationary status for the subsequent semester. Incomplete grades must be changed to a grade of A or B by the end



of the probationary semester (dissertation research incompletes are evaluated as S/U until the dissertation is defended). Failure to comply in a satisfactory manner with all responsibilities related to graduate assistantships. Graduate students in our department are expected to conduct themselves in a manner reflecting the university's commitment to professional integrity, collegiality, and good citizenship. Students who consistently fail to conduct themselves in this manner may be subject to probation or dismissal. In the case of each student on departmental probation, the director of graduate studies will confer with the adviser (in the case of an MA student), or the members of the program committee (in the case of a PhD student) to determine the grounds for removal of probation, and will communicate this decision to the student.

## Annual Review

Each Fall semester the director of graduate studies convenes the Graduate Studies Committee to review the progress and performance of all graduate students.

Each graduate student in residence should meet with his or her adviser within the first two weeks of each semester to determine whether satisfactory progress has been maintained, and the adviser shall report the results of this meeting to the director of graduate studies.

## Losing & Regaining Financial Support

Termination of departmental financial support will result if the student is considered to be making unsatisfactory progress and the student's program may be terminated. Departmental financial support may be restored when the student has made satisfactory progress toward a graduate degree for one semester, has made an A or a B in all incomplete courses, and is judged to be off probation by the director of graduate studies.

## Undergraduate

### Department Level Requirements - Theatre

#### Departmental Honors

To graduate with honors in theatre, a student must earn a minimum overall MU GPA of 3.3 and earn a minimum GPA of 3.5 in courses in theatre completed at the University of Missouri.

## BA in Theatre

### Major Program Requirements

The major in Theatre consists of core courses and an emphasis area. In addition, all students must complete all College of Arts and Sciences and University graduation requirements, including University General Education (p. 18). All courses used to satisfy requirements for the major must be completed with a grade of C or higher.

<b>Major core requirements</b>	<b>15</b>
THEATR 1320 Beginning Scenic Construction Lab	3
or THEATR 1340 Beginning Costume Construction Lab	
THEATR 2300 Production Workshop I	1
THEATR 2710 Introduction to Theatre History	3

THEATR 2800 Principles of Script Analysis	3
THEATR 3300 Production Workshop II	1
THEATR 4990 Capstone in Theatre	1

#### Select 3 hours from:

THEATR 1720 African-American Theatre History	3
THEATR 3700 World Dramatic Literature	3
THEATR 3750 New American Theatre	3
THEATR 3770 The Theatre Experience: From Page to Stage and Screen	3
THEATR 4700 Studies in Theatre History	3
THEATR 4720 American Musicals	3
THEATR 4800 Studies in Dramatic Theory	3
THEATR 4820 Studies in Dramatic Literature	3
THEATR 4830 Studies in Dramatic Criticism	3

## Emphasis Areas

Theatre students must also complete an emphasis area in Performance (p. 298), Design/Technical (p. 297) or Writing for Performance (p. 298).

## Semester Plan

Refer to the semester plan for the Performance emphasis (p. 298), or contact the academic departments for assistance with academic planning.

## BA in Theatre with Emphasis in Design/Technical

### Major Program Requirements

Department Level Requirements (p. 297)

Design/technical classes chosen from	16
THEATR 1360 Stage Makeup	1
THEATR 2330 Stage Management	3
THEATR 2360 Stagecraft	3
THEATR 2510 Introduction to Theatre Design	3
THEATR 3310 Costume Crafts	3
THEATR 3320 Theatrical Patternmaking	3
THEATR 3330 Advanced Costume Construction	3
THEATR 3340 Scene Painting	2
THEATR 3530 Computer Graphics in Theatre Design	3
THEATR 3540 Advanced Stage Makeup	2
THEATR 3550 Sound Design	3
THEATR 3560 Scene Design	3
THEATR 4530 Stage Lighting Design	3
THEATR 4570 Theatrical Costume Design	3
Performance classes	3

## Semester Plan

See the Performance (p. 298) emphasis for a sample semester plan.

## BA in Theatre with Emphasis in Performance

### Major Program Requirements

Department Level Requirements (p. 297)

THEATR 4570	Theatrical Costume Design	3
Performance classes chosen from		14
THEATR 1250	World Theatre Workshop	2
THEATR 1360	Stage Makeup	1
THEATR 1420	Stage Movement for the Actor	2
THEATR 2200	Introduction to Performance Studies	3
THEATR 2410	Performance Workshop	1
THEATR 3200	Performance of Literature	3
THEATR 3230	Vocal Performance Technique	3
THEATR 3420	Acting I	3
THEATR 3430	Acting II	3
THEATR 3600	Theatrical Directing	3
THEATR 4220	Acting III	3
THEATR 4240	Theory and Practice of Theatre of the Oppressed	3
THEATR 4460	Musical Theatre Performance	3
THEATR 4600	Advanced Directing	3
Design / technical classes		2-3

### Semester Plan

See also Technical Theatre and Writing for Performance emphasis areas.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
Behavioral Science	3	Am. Government or History	3
Foreign Language I	5	Foreign Language II	5
THEATR 1320 or 1340	3	THEATR 2800	3
THEATR 2710	3		
	17		14
Second Year			
Fall	Credits	Spring	Credits
Humanities*	3	Foreign Language III	3
Biological/Physical/Math Science <sup>+</sup>	3	Biological/Physical/Math Science	4-5
Social Science	3	General Elective	3
THEATR 2300	1	Theatre Performance Electives	6
Theatre Design/Tech Elective	3		
	13		16-17
Third Year			
Fall	Credits	Spring	Credits
Humanities	6	Social Science <sup>++</sup>	3
Behavioral Science <sup>++</sup>	3	General Electives	6
Theatre Performance Electives	6	THEATR 3300	1

THEATR 4570	3	Electives	3
	18		13
Fourth Year			
Fall	Credits	Spring	Credits
Biological/Physical/Math Science	3	Humanities <sup>++</sup>	3
Theatre Performance Elective	6	THEATR 3700	3
THEATR 4990	1	Upper Division WI Course	3
General Electives	9	3000+-level Elective	3
	19		12
Total Credits: 122-123			

\* Writing Intensive

+ Math Reasoning Proficiency

++ Course numbered 2000 or above

## BA in Theatre with Emphasis in Writing for Performance

### Major Program Requirements

Department Level Requirements (p. 297)

THEATR 2510	Introduction to Theatre Design	3
THEATR 2920	Beginning Playwriting	3
THEATR 3200	Performance of Literature	3
THEATR 3920	Intermediate Playwriting	3
Two courses chosen from		6
THEATR 3600	Theatrical Directing	3
THEATR 3700	World Dramatic Literature	3
THEATR 3930	Screenwriting for Television and Film	3
THEATR 4920	Advanced Playwriting: Problems	3
THEATR 4220	Acting III	3
THEATR 4460	Musical Theatre Performance	3
THEATR 4600	Advanced Directing	3
THEATR 4930	Adaptation of Literature for the Stage	3
THEATR 4935	Adaptation of Literature for Film	3

### Semester Plan

See the Performance (p. 298) emphasis for a sample semester plan.

## Minor in Theatre

A minor in theatre consists of two core courses and 12 additional credits in theatre.

<b>Two Core Courses</b>		6
THEATR 1320	Beginning Scenic Construction Lab	3
or THEATR 1340	Beginning Costume Construction Lab	
THEATR 2800	Principles of Script Analysis	3
<b>Additional Theatre credits (at least 6 must be 3000 or above)</b>		12

## Graduate

## MA in Theatre

Graduate Contact/Administrative Assistance  
 Tina Edholm (edholmc@missouri.edu)  
 129 Fine Arts Building; Columbia, MO 65211  
 573-882-2021  
<http://theatre.missouri.edu/gradprogram/index.html>

Director of Graduate Studies  
 Dr. Heather Carver  
 129 Fine Arts Building; Columbia, MO 65211  
 573-882-2021  
 carverh@missouri.edu

### Admission Criteria

<http://theatre.missouri.edu/gradprogram/index.html>

Deadline: January 15 for the following fall semester admission. We only admit once a year, barring extraordinary circumstances.

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
112	650

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	600	500	4.0
On or After August 1, 2011	160	146	4.0

- Minimum GPA: 3.0 in the last 60 hours

Probationary admission is possible. The director of graduate studies will advise the student in writing of what must be done to change the probationary admission to regular admission.

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Theater Program:*

- 3 letters of recommendation
- GRE score report
- Statement of purpose
- Scholarly writing sample

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

### Curriculum Requirements

The degree of Master of Arts in Theatre will be awarded upon completion of the curriculum outlined below with a GPA of 3.0 or better.

### Completed Undergraduate Curriculum

Most students have completed this course of study before seeking admission to MU. However, applicants holding undergraduate degrees in disciplines other than theatre will be asked to complete those courses, which were not part of their undergraduate curriculum. In some cases professional theatre experience may substitute for certain courses. Twelve courses in the undergraduate curriculum should be distributed as follows:

Basic skills: at least one course in each of the following: voice and articulation, movement for the stage, script analysis, technical theatre; At least one upper-division course in each of the following: acting, directing, dramatic literature, theatre history; at least two upper-division courses in technical theatre; and two upper-division theatre electives.

### Graduate Curriculum

The student must complete at least 24 graduate hours while in residence as a graduate student at MU. The academic program should be established in consultation with an adviser not later than the end of the first full semester of residence. No more than six semester hours of graduate work may be transferred from another university. The student submits Form M-1, Application for Degree of Master of Arts to the Graduate School listing the courses to be taken to complete the graduate curriculum.

### Independent Project

Each candidate for the MA must complete an independent project, which should be specified on the M-1 form as part of the plan of study.

There are three options:

1. This may be a thesis, for which up to six semester hours of credit in Theatre Research may be earned.
2. Another option is to write an original performance/play, translate a play/performance, or complete a project in acting, design, adaptation/devising, dramaturgy, solo performance or directing. Credit of up to three semester hours may be earned in a graduate problems course.
3. A student may create and successfully execute a research project to earn three semester hours in a graduate course in independent research.

### Satisfactory Progress: General Guidelines for MA in Theatre

#### Probationary Status

The following constitute grounds for placing a student on departmental probation:

Earning a grade of C or below in any departmental course taken for graduate credit will result in probationary status. A grade of incomplete in any course will result in probationary status for the subsequent semester. Incomplete grades must be changed to a grade of A or B by the end of the probationary semester (dissertation research incompletes are evaluated as S/U until the dissertation is defended). Failure to comply in a satisfactory manner with all responsibilities related to graduate assistantships. Graduate students in our department are expected to conduct themselves in a manner reflecting the university's commitment to professional integrity, collegiality, and good citizenship. Students who consistently fail to conduct themselves in this manner may be subject

to probation or dismissal. In the case of each student on departmental probation, the director of graduate studies will confer with the adviser (in the case of an MA student), or the members of the program committee (in the case of a PhD student) to determine the grounds for removal of probation, and will communicate this decision to the student.

## Annual Review

Each Fall semester the director of graduate studies convenes the Graduate Studies Committee to review the progress and performance of all graduate students.

Each graduate student in residence should meet with his or her adviser within the first two weeks of each semester to determine whether satisfactory progress has been maintained, and the adviser shall report the results of this meeting to the director of graduate studies.

## Losing & Regaining Financial Support

Termination of departmental financial support will result if the student is considered to be making unsatisfactory progress and the student's program may be terminated. Departmental financial support may be restored when the student has made satisfactory progress toward a graduate degree for one semester, has made an A or a B in all incomplete courses, and is judged to be off probation by the director of graduate studies.

## Master's Final Examination

Master's degree students who have been maintaining satisfactory progress toward a degree for a period of 24 months are expected, barring unusual and extenuating circumstances, to be prepared to write the master's final examination.

Each candidate for the MA is required to pass a final examination to demonstrate mastery of the fundamental principles of the work included in the course of study. An examining board consisting of at least three members of the faculty shall administer the examination.

In consultation with his or her adviser the student selects four areas for examination from among those listed below:

At least two but no more than three areas may be selected from among:

Theatre History and Historiography  
 Dramatic Literature and Criticism  
 Dramatic and Performance Theory  
 Performance Studies and Writing for Performance

At least one but no more than two areas must be selected from among:

History, Theory or Pedagogy of Acting or Directing  
 History, Theory or Pedagogy of Dramaturgy  
 History, Theory or Pedagogy of Theatrical Design  
 History, Theory or Pedagogy of Performance Studies  
 History, Theory or Pedagogy of Playwriting/Writing for Performance

## Length of Exam

Two hours are allotted for answering the question(s) for each area, making a total of eight hours for the examination.

## Notifying the Graduate School of Results

As soon as the performance on the Master's Final Examination has been evaluated, the student's adviser informs the Graduate School, using the appropriate M-form.

If one area examination is unsatisfactory, the examining board will give the student an oral examination on that area, with special emphasis on the questions or questions missed. If two area examinations are unsatisfactory, the student is failed.

## PhD in Theatre

### Admission Contact Information

Graduate Contact/Administrative Assistance  
 Tina Edholm (edholmc@missouri.edu)  
 129 Fine Arts Building; Columbia, MO 65211  
 573-882-2021  
<http://theatre.missouri.edu/gradprogram/index.html>

Director of Graduate Studies  
 Dr. Heather Carver  
 129 Fine Arts Building; Columbia, MO 65211  
 573-882-2021  
[carverh@missouri.edu](mailto:carverh@missouri.edu)

### Admission Criteria

Deadline: January 15. We only admit once a year, barring extraordinary circumstances.

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
112	650

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	600	550	5.0
On or After August 1, 2011	160	146	4.0

- Minimum GPA: 3.0 in the last 60 hours
- GPA of 3.5 or better in master's program

### Required Application Materials

*To the Graduate School:*

All required Graduate School documents

*To the Program:*

- 3 letters of recommendation
- GRE score report
- Statement of purpose
- Scholarly writing sample
- Professional resume or portfolio
- Creative (dramatic) writing samples

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Careers

The doctorate in theatre at MU aims to provide knowledge and research skills necessary to launch the successful student on a career of scholarly and artistic investigation of theatre history, performance theory and criticism, performance studies, playwriting and other modes of writing for performance (such as adaptation and translation), dramaturgy, performance and theatre pedagogy.

## Qualifying Examination

During the first semester of residence, the student completes a qualifying examination. The Graduate Affairs Committee of the Department of Theatre meets with the student to discuss the student's academic background, career goals and research interests for an oral review and discussion of their proposed course of study. The adviser submits the D-1 form, Qualifying Process/Confirmation of Adviser, reporting on the departmental qualifying process.

## Advisory Committee: Form D-1

Doctoral Program Committee asks the graduate dean to approve a committee of four graduate faculty members to help the student plan and carry out a program. One member of the Doctoral Program Committee must come from outside the Department of Theatre.

## Program Planning

As early as is practical, usually in the student's second semester on campus, the student should meet with the Doctoral Program Committee to plan a doctoral program. The student should prepare a trial plan in consultation with the faculty adviser who serves as chair of the Doctoral Program Committee and reports the approved plan of study to the graduate dean on Form D-2: Doctoral Plan of Study.

## Theatre Department Course Work

Although the Graduate School requires no specific number of hours of class work, the Department of Theatre typically requires students entering the program with a master's degree to complete about 40 semester hours of graduate level course work in the theatre department, including three semester hours of Dissertation Research, devoted to writing a dissertation prospectus. For more specific information regarding required coursework, see <http://theatre.missouri.edu/gradprogram/index.html>.

## Doctoral Minor

The department also requires the student to complete a doctoral minor, a nine-semester-hour unified area of study outside the Department of Theatre.

## Research Tool Options

The PhD in Theatre also includes a research tool requirement that may be satisfied in several ways:

1. Option One: Present evidence of translation ability in each of two foreign languages in one of the following ways: by receiving an acceptable score on a GFSLT Humanities examination if the language is French, German or Spanish (Acceptable scores at this time are: French 570, German 560 and Spanish 540) by receiving certification of competence from a qualified examiner if other languages are presented by showing on one's transcript a grade of B or better on a literature course at MU. (This course must

require reading of works in the foreign language. The course may be taken during the doctoral program or within the five years prior to beginning the program.)

2. Option Two: Demonstrate a high degree of fluency in one foreign language by individual examination conducted by the appropriate language department at MU.
3. Option Three: Choose one language and one block of courses. Demonstrate translation ability for one language as in Option One. Complete with grades of B or better six semester hours in graduate courses taken outside of the department that represent a coherent unit of study, providing a research tool applicable to the candidate's dissertation research.
4. Option Four: Choose two blocks of courses. Complete with grades of B or better two blocks of course work of six hours each in graduate level courses taken outside of the department that must represent to the candidate's advisory committee a coherent unit of study. One or both blocks should provide a research tool for the candidate's dissertation.

## Participation in Productions

The doctoral student is encouraged to participate in University Theatre and studio theatre productions and may, in some cases, be required to do so. Academic credit is available.

## Satisfactory Progress Guidelines for the PhD in Theatre

### Probationary Status

The following constitute grounds for placing a student on departmental probation:

- Earning a grade of C or below in any departmental course taken for graduate credit will result in probationary status.
- A grade of incomplete in any course will result in probationary status for the subsequent semester. Incomplete grades must be changed to a grade of A or B by the end of the probationary semester (dissertation research incompletes are evaluated as S/U until the dissertation is defended).
- Failure to comply in a satisfactory manner with all responsibilities related to graduate assistantships. Graduate students in our department are expected to conduct themselves in a manner reflecting the university's commitment to professional integrity, collegiality, and good citizenship.
- Students who consistently fail to conduct themselves in this manner may be subject to probation or dismissal. In the case of each student on departmental probation, the director of graduate studies will confer with the adviser (in the case of an MA student), or the members of the program committee (in the case of a PhD student) to determine the grounds for removal of probation, and will communicate this decision to the student.

### Annual Review

Each Fall semester the director of graduate studies convenes the Graduate Studies Committee to review the progress and performance of all graduate students.

Each graduate student in residence should meet with his or her adviser within the first two weeks of each semester to determine whether

satisfactory progress has been maintained, and the adviser shall report the results of this meeting to the director of graduate studies.

## Losing & Regaining Financial Support

Termination of departmental financial support will result if the student is considered to be making unsatisfactory progress and the student's program may be terminated. Departmental financial support may be restored when the student has made satisfactory progress toward a graduate degree for one semester, has made an A or a B in all incomplete courses, and is judged to be off probation by the director of graduate studies.

## Satisfactory Progress Before the Comprehensive Exam

Each semester prior to the semester in which comprehensive examinations are taken, satisfactory progress is maintained when a student completes nine semester hours of graduate level work with a grade of B or above. Incomplete grades are given only under extraordinary circumstances and with the approval of the graduate faculty. Doctoral students who have been maintaining satisfactory progress toward a degree for a period of 36 months are expected, barring unusual and extenuating circumstances, to be prepared to write comprehensive examinations.

## Satisfactory Progress During and After Comps

For the semester in which comprehensive examinations are taken and in semesters after comprehensive exams and orals are passed, satisfactory progress is maintained when, in the judgment of the student's dissertation adviser, the student is making satisfactory progress toward completion of the dissertation.

Students who leave MU having completed all but the dissertation must maintain continuous enrollment by registering for two semester hours of Dissertation Research each fall and spring term and one hour in the summer term. Failure to register negates a student's candidacy.

## Graduate School Regulations on Satisfactory Progress

The Graduate School regulations regarding a reasonable rate of progress for doctoral students enrolled during or after Fall 2000: Effective for students beginning their doctoral studies during or after Fall Semester 2000, a PhD student must successfully complete the comprehensive exam within a period of five years beginning with the first semester of enrollment as a PhD student. For an extension of this time limit, the student must petition the Graduate School by submitting a request to the adviser, who, in turns, submits, via the departmental director of graduate studies, a written recommendation to the Graduate School. The Theatre Department recommends taking comprehensive exams no later than the third year of consecutive full enrollment. Only students who have taken and passed their exams by May of their third year of assistantship will be considered for a fourth year of assistantship with the department.

All requests for extensions should be endorsed by the departmental director of graduate studies and should be accompanied by a description of the process whereby currency in the discipline is certified, if required by the department.

## Dissertation Proposal/Prospectus

Before comprehensive exams may be scheduled, students will be required to complete a 5-page Dissertation Proposal, concisely but clearly expressing the purpose, justification, method and general organizational plan for the dissertation. A bibliography is also required (bibliography is not included in 5 pp. minimum). The theatre department faculty members on student's doctoral committee must approve this proposal. After successful completion of comprehensive exams, the student will expand the dissertation proposal into a Dissertation Prospectus — a more detailed and thorough description of the dissertation project. The prospectus should provide a clear statement of the purpose of the dissertation, describe the need for the knowledge the dissertation report will supply, outline the research questions and demonstrate the procedures by which the scholar will answer these questions. The candidate will present the prospectus to the Doctoral Program Committee and will be prepared to defend it.

## Comprehensive Examination

After completing the research tool option, a substantial amount of the course work and after obtaining the approval of the 5-page proposal from the Doctoral Program Committee, the student takes the comprehensive examination. The comprehensive examination provides an opportunity for the student to demonstrate a thorough grasp of the history and principles of theatre. The examination provides the Doctoral Program Committee with a window looking back upon the student's training as well as a chance to estimate the student's potential as a problem solving scholar of theatre. Readers of the examination look for more than a reiteration of the content of standard sources of information about dramatic art. The examinee should demonstrate an ability to analyze problems and data, to formulate theses or points of view, and to locate, evaluate and organize evidence to support a contention—the essential skills of scholarship. The comprehensive examination in theatre allows candidates not only to tell what they know but also to demonstrate what they can do with information. Comprehensive exams are scheduled once each semester, during the first third of the current semester.

## Stages of the Comprehensive Exam

The examination is given in two stages.

- Stage One consists of a written examination, over the history of theatre, dramatic theory, criticism, writing for performance, performance studies, and theatre pedagogy, and an additional (written) examination consisting of one or two questions posed by the outside member of the Doctoral Program Committee. The examination is evaluated by the student's Doctoral Program Committee, which decides whether or not the student should be advanced to the oral examination.
- Stage Two is the oral examination administered by the Doctoral Program Committee. This examination provides an opportunity for the student to correct, amend, or defend assertions made in the written examination, although the oral examination is not bound by any limits established by the written examination. Ordinarily of two hours duration, the oral is also an opportunity for the student to demonstrate skill in oral explanation and argument.

## Criteria for Passage of the Comprehensive Exam

The result of the comprehensive examination shall be marked pass if all of the Doctoral Program Committee members recommend a pass

on the entire examination, both written and oral sections. Should the examination be marked fail, the committee may recommend that the candidate retake the examination after a minimum period of 12 weeks. A report of the committee's decision (Form D-3), carrying the signatures of all members of the committee, is sent to the Graduate School and to the student no later than two weeks after the comprehensive examination is terminated.

If a failure is reported, the committee also must include in the report an outline of the general weaknesses or deficiencies of the student's work. The student and the committee members are encouraged to work together to identify steps the student might take to become fully prepared for the next examination. If at any time the student believes that the advice given by the committee is inadequate, the student may send a written request for clarification to the committee. A copy of this request should be sent to the Graduate School. The committee must respond to this request in writing within two weeks with a copy to the Graduate School. Failure to pass two comprehensive examinations automatically prevents candidacy for the doctorate in theatre at MU.

## **Completing the Dissertation**

The final step is completion and approval of the doctoral dissertation. The director of graduate studies can provide the student a copy of Guidelines for Preparing Theses and Dissertations.

## **Formatting**

Dissertations in the Department of Theatre should be formatted according to the latest edition of *A Manual for Writers of Term Papers, Theses, and Dissertations*, ed. Kate L. Turabian or the *MLA Handbook*; the chosen format must meet with the dissertation advisor's approval.

## **Graduate School Paperwork**

Form D-4, Report of the Doctoral Dissertation Defense, indicates that the student has defended the dissertation at an oral examination.

## **Advisory and Committee Approval of the Dissertation**

No draft of the dissertation can be considered a final draft until the adviser (First Reader) has approved it. All dissertation committee members must have at least 10 days to read the dissertation before the last date for oral examination as published by the Graduate School. Unanimous approval of the dissertation by four committee members constitutes satisfactory completion of this examination.

## Additional Minors and Certificates - A&S

### Undergraduate

- Minor in Aerospace Studies (p. 304)
- Minor in Afro-Romance Literatures in Translation (p. 304)
- Minor in Astronomy (p. 304)
- Minor in Black Studies (p. 304)
- Minor in Canadian Studies (p. 305)
- Minor in East Asian Studies (p. 305)
- Minor in French (p. 305)
- Minor in Italian Area Studies (p. 305)
- Minor in Jazz Studies (p. 306)
- Certificate in Jazz Studies (p. 306)
- Minor in Latin American Studies (p. 306)
- Minor in Leadership and Public Service (p. 306)
- Minor in Luso-Brazilian Area Studies (p. 306)
- Minor in Medieval and Renaissance Studies (p. 307)
- Minor in Military Science (p. 307)
- Certificate in Multicultural Studies (p. 307)
- Minor in Peace Studies (p. 307)
- Minor in Romance Literatures in Translation (p. 308)
- Minor in South Asian Studies (p. 308)
- Minor in Spanish (p. 308)
- Minor in Strategic Studies (p. 309)
- Minor in Women's and Gender Studies (p. 309)

### Graduate

- Minor in Black Studies (p. 309)
- Certificate in Jazz Studies (p. 310)
- Certificate in Life Span Development (p. 310)
- Minor in Medieval and Renaissance Studies (p. 311)
- Minor in Museum Studies (p. 312)
- Minor in Psychological Statistics and Methods (p. 312)
- Certificate in Science Outreach (p. 312)
- Minor in Women's and Gender Studies (p. 313)

## Undergraduate

### Minor in Aerospace Studies

A minor in Aerospace Studies is available upon the completion of 15 semester hours, of which 12 hours are taught by Aerospace Studies. The additional 3 hours must be approved by the Department of Aerospace Studies and be in the academic area of history, political science, sociology, military science disciplines, or peace studies.

## Minor in Afro-Romance Literatures in Translation

Students may obtain a minor in Afro-Romance literatures in translation by completing the courses listed below.

SPAN 1100 & SPAN 1200 & SPAN 2100	Elementary Spanish I and Elementary Spanish II and Elementary Spanish III	13
ITAL 1100 & ITAL 1200	Elementary Italian I and Elementary Italian II	10-12
or PORT 1100 & PORT 1200	Elementary Portuguese I and Elementary Portuguese II	

Three 2000-level literature-in-translation courses chosen from the following list (at least two language groupings must be represented):

FRENCH 2350	New World Francophone Literature in Translation	3
RM_LAN 2310	Literature of the African Diaspora	3
SPAN 2340	Hispanic Minority Literature	3

Two 3000-level or 4000-level courses chosen from the following list:

FRENCH 3710	Survey of Minority & Creole Languages of the U.S. & the Caribbean	3
or SPAN 3710	Survey of Minority & Creole Languages of the U.S. & the Caribbean	
PORT 3001	Topics in Portuguese-General	1-3
or PORT 3005	Topics in Portuguese-Humanities/Fine Arts	
RM_LAN 4310	Literature of the African Diaspora	3

Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the minor.

## Minor in Astronomy

A student whose major is in another department may receive a minor in astronomy with the completion of the following courses with grades of C- or better: PHYSCS 2750 University Physics I, PHYSCS 2760 University Physics II (10 credit hours), PHYSCS 3010 Introduction to Modern Astrophysics (3 credit hours), plus two additional astronomy courses at the 3000/4000 level or above.

A student must have a total of 19 credit hours to receive a minor in astronomy. At least nine of the 19 credit hours must be completed on-campus. A course in which a grade of D+ or below was received will not count towards the minor. To receive your minor in astronomy, you must print and fill out the minor form (<http://physics.missouri.edu/wp-content/uploads/2012/04/fileAstronomyMinorForm.pdf>), have it signed by the Director of Undergraduate Studies in the Physics Department, and then take it to 107 Lowry Hall.

## Minor in Black Studies

Students seeking a minor in black studies must complete 15 credits, including those listed below.

BL_STU 2000	Black Studies	3
One course in each of three content areas (one must focus on black women)		9
History		



**Society**
**Culture**

- Students are also encouraged to take a course in three regional areas of study: Africa, African America, and the Black Diaspora.
- A minimum of 6 credits numbered 2000 or above and at least one 3000-level course must be taken.
- At least 9 credits must be in courses other than readings, methods, techniques or problems.
- A maximum of 3 credits of the minor can be taken in black studies courses outside the College of Arts & Science.

## Minor in Canadian Studies

A Minor in Canadian Studies allows you to

- participate in Study Abroad programs in Canada
- enhance your degree and career options
- learn about the culture, history, and politics of Canada

With a minor in Canadian Studies, students will be better equipped to deal with political, economic, social and even cultural issues that will arise vis-a-vis Canada, a close military ally and trading partner. In an era that features the internet, Free Trade, and most importantly, issues of border security and national defense, knowledge of Canada is particularly useful in a number of careers. The Canadian Studies Program is an interdisciplinary program which includes Political Science, Geography, Anthropology, Romance Languages, and Public Affairs. The minor concentration in Canadian Studies will require 15 hours of credits. Courses may be selected from any two of the disciplines listed below.

**Courses in Political Science**

POL_SC 2600	Canadian Politics and Government	3
POL_SC 4660	Canada in North America	3
POL_SC 4986	Special Readings in Political Science (consult with professor if interested)	1-99

Canadian Politics: Fundamentals and Selected Topics

**Courses in Geography**

GEOG 2120	United States and Canada	3
GEOG 1100	Regions and Nations of the World I	3
GEOG 3780	World Political Geography: Patterns and Processes	3

**Courses in Anthropology**

ANTHRO 2030	Cultural Anthropology	3
ANTHRO 1300	Multiculturalism: An Introduction	3
ANTHRO 4600	Ethnographic Studies of Selected Cultures	3

**Courses in Romance Languages and Literatures**

FRENCH 2370	French Women Writers (in translation)	3
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The French Novel of Quebec

**Courses in English**

ENGLSH 4129	Ethnic Literature, 1890 to Present	3
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## Minor in East Asian Studies

Students select 15 credits from at least two departments. At least 6 credits must be at the 2000 level or above. The elementary levels of language (Japanese, Chinese, Korean) may not be used to meet any of these hour requirements for the minor. Intermediate level courses (at

the 2000 level and higher) language courses may be used to meet these requirements. The Office of Special Degree Programs, 210 Switzler Hall, provides student advisement.

In addition to courses offered in Chinese, Japanese, and Korean language programs (civilization courses, literature courses, film courses, theater courses), there are relevant courses offered in Religious Studies, History, Political Science, Philosophy, and Geography. Students are encouraged to consult with the advisor in Special Degree Programs or instructors in Chinese, Japanese, or Korean.

## Faculty for East Asian Studies

### Chinese

**Assistant Teaching Professor** Michael Volz

**Lecturer** Huichung Liang

### Japanese

**Assistant Teaching Professor** J. Martin Holman

**Lecturer** Chieko Kellar

### Korean

**Associate Teaching Professor** Seungkwon You

## Minor in French

Students may obtain a French minor by completing a minimum of 15 credits beyond FRENCH 2100, of which at least 6 credits must be in literature. Courses taught in English and cross-listed courses taught in English do not count toward the minor. The courses listed below are the most likely choice.

FRENCH 2160	Intermediate French Composition and Conversation	3
FRENCH 3160	Advanced French Composition and Conversation I	3
or FRENCH 3280 Commercial French		
FRENCH 3410	Introduction to Literary Analysis	3
FRENCH 3420	Introduction to French Literature I	3
FRENCH 3430	Introduction to French Literature II	3

Students beginning at a level higher than FRENCH 2160 due to placement testing must still complete the minimum of 15 additional credits in order to receive the minor. A minimum of 9 credits, including 3 in literature, must be taken in residence.

Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the minor.

## Minor in Italian Area Studies

Students may obtain a minor in Italian area studies by completing at least 9 credits in Italian language beyond ITAL 1200, e.g.: ITAL 2160, ITAL 3150 or ITAL 3160. An additional 6 credits must be chosen from the list below:

ITAL 2001/2005	Undergraduate Topics in Italian-General	1-3
ITAL 2310	Italian Civilization	3
ITAL 3001/3005	Topics in Italian-General	1-3
ITAL 3310	20th Century Italian Fiction in Translation	3

Italian culture/topics emphasis courses offered by other programs/departments (e.g., History, Art History, Music or International Studies).

Normally, 9 credits must be completed in residence at MU. However, students are permitted to count 6 credits toward the minor from an officially sanctioned semester or year-long foreign study program in Italy. Six credits toward the minor can also be earned in summer programs abroad, such as the summer intensive language program offered by the University of Bergamo (near Milan) or by the Centro Fiorenza in Florence or on the Island of Elba.

Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the minor.

## Minor in Jazz Studies

Student who have chosen a major in a non-music field may complete a minor in jazz. The Minor is not intended for beginners, but for students with basic musical knowledge. Hence the prerequisites (MUSIC\_NM 1211 or MUS\_THRY 1220) for three of the required courses (MUS\_I\_VT 1620, MUS\_I\_VT 4645, and MUS\_THRY 4210) and auditions required for Jazz Ensembles. Approval for declaration of the Jazz Minor must be received from the Director of Jazz Studies.

A minimum of 15 credits is required, including the following:

MUS_THRY 4210	Jazz Harmony and Arranging I	2
MUS_THRY 4211	Jazz Harmony and Arranging II	2
MUS_I_VT 1620	Jazz Piano Class	1
MUS_I_VT 4645	Jazz Improvisation	2
MUSIC_NM 1311	Jazz, Pop, and Rock	3
MUS_ENS 1841 & MUS_ENS 1846	Instrumental Ensemble and Chamber Music (Large Jazz Ensemble & Small Jazz Ensemble)	2
MUSIC_NM 2445	Studio Instruction for Non-Majors (Or additional hours in Jazz Ensembles)	3
<b>Total Credits</b>		<b>15</b>

## Certificate in Jazz Studies

Music Majors (BM, BA Music) and Music Education majors (BSEd) may earn a Certificate in Jazz Studies by completing this core of courses in jazz. Approval for admission into the Certificate program must be received from the Director of Jazz Studies.

A minimum of 12 credits is required, including the following:

MUS_THRY 4210	Jazz Harmony and Arranging I	2
MUS_THRY 4211	Jazz Harmony and Arranging II	2
MUS_I_VT 1620	Jazz Piano Class	1
MUS_I_VT 4645	Jazz Improvisation	2
MUS_H_LI 4317	Historical Studies in Jazz and Popular Music	3
MUS_ENS 1841	Instrumental Ensemble	2
<b>Total Credits</b>		<b>12</b>

## Minor in Latin American Studies

Students who have completed the language requirement in Spanish or Portuguese (or equivalent) may select, in conjunction with an advisor, 15 additional credits of approved course work. The minor in Latin American studies must be approved by the Director of Special Degree Programs.

## Minor in Leadership and Public Service

The Minor in Leadership and Public Service combines an academic component of courses in leadership, public policy, ethics, and social issues with a strong focus on service-learning, community service, and public service internships.

Consider this minor if you are:

- Interested in a self-crafted minor that provides a framework for your own leadership goals
- Set on developing the skills needed to succeed in both the non-profit sector and government
- Determined to give back on a local, national, and international level
- Looking for an opportunity to set yourself apart from the applicant pool for both graduate and professional school

For more information, contact:

Kirsten Pape  
 MU Office of Service Learning  
 208 Lowry Hall  
 Columbia, MO 65211  
 573-882-0227  
 servicelearning@missouri.edu

## Minor in Luso-Brazilian Area Studies

Students may obtain a minor in Luso-Brazilian Area Studies by completing at least 9 credits in the Portuguese language beyond Portuguese 1200, e.g. PORT 2160, PORT 3160, and PORT 4960.

An additional 6 credits may be chosen from the following list:

PORT 2310	Brazilian Civilization	3
PORT 3001/3005	Topics in Portuguese-General	1-3
PORT 3420	Survey of Brazilian Literature	3
PORT 3875	Brazilian Cinema	3
SPAN 2330	Latin American Civilization	3

Luso-Brazilian culture/topics emphasis courses offered by other programs/departments (e.g. Anthropology, History, Music, Political Science).

Normally 9 credits must be completed in residence at MU. However, students are permitted to count 6 credits toward the minor from an officially sanctioned semester or year-long foreign study program in Brazil or Portugal. These include the MU in Rio de Janeiro program at the Pontificia Universidade Catolica and the CIEE Universidade Nova de Lisboa program.

Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a minimum GPA of 2.0 in the minor.

## Minor in Medieval and Renaissance Studies

Think dead languages, medieval literature, and old castles are cool? Love your Shakespeare or Art History class and interested in learning more about the Middle Ages or the Renaissance? Then explore the possibility of a MARS undergraduate minor, in which students do coursework on medieval and Renaissance topics, receiving outstanding instruction from faculty in up to eleven different academic departments. For students interested in medieval and Renaissance history, art, literatures, religion, music, languages, and culture, the MARS minor offers the possibility of furthering interests while studying more broadly towards your major. Meet others interested in the same things as you, incorporate classwork you've already done, and learn new things about the Middle Ages and Renaissance, all while showing prospective employers or graduate schools the depth of your study with an official minor in MARS!

### Requirements

- A minimum of fifteen (15) hours of approved coursework (see list below) in two different departments outside the student's major department.
- At least nine (9) hours of the fifteen must be in courses numbered 2000 or above.
- At least three (3) hours of the fifteen must be taken in a course numbered 3000 or above.
- A minimum of nine (9) hours must be taken in residence.
- A minimum GPA of 2.0 is required in all courses in the minor.
- Only one course from Classics may count towards the minor
- Students may specialize in either medieval or Renaissance, but must take at least one course in both.
- Students and their advisors may petition the Chair of MARS (Dr. Emma Lipton, English) to have coursework with relevant content counted. Students may count courses toward the minor that are also used to fulfill general education requirements in the College of Arts and Science. Many upper-level courses in European languages and literatures may be used to fulfill the minor requirements.

Departments keep a list of courses approved for the MARS minor on file for advisors. For a full description of the minor, including a list of all courses currently counted toward the minor, go to [http://medren.missouri.edu/MARS\\_MinorDocument2012.pdf](http://medren.missouri.edu/MARS_MinorDocument2012.pdf).

## Minor in Military Science

With departmental approval, students may earn a minor in military science and leadership by successfully completing the following courses:

MIL_SC 3230	Leadership and Problem Solving	3
MIL_SC 3240	Leadership and Ethics	3
MIL_SC 3250	Leadership and Management	3
MIL_SC 3260	Officership	3

Additionally, students must complete an approved course in American military history.

## Certificate in Multicultural Studies

The College of Arts and Sciences offers a Certificate in Multicultural Studies. Students earning the certificate will become familiar with multicultural and diversity issues. In an increasingly global environment, students earning this certificate will be better prepared to understand and to facilitate cross-cultural interactions in their future careers, as well as in their general life experiences.

### Requirements

Students are required to complete a coherent program of 15 credit hours from a list of approved courses\*. Approved courses for the certificate critically evaluate and examine issues of social inequality and social stratification (e.g., gender, race, ethnicity, religion, region, sexuality, and/or class inequality) globally and in the United States. Courses must be chosen from at least 2 different departments/programs. At least 6 credits must be completed at the 3000 level or above. One course (up to 3 credit hours minimum and 6 credit hours maximum) may include an applied experience of cultural difference\*. Approved research-based undergraduate courses, transcribed Study Abroad and other experiences approved through the Center for International Programs and Studies, and transcript-designated "Service Learning" coursework are among the possibilities. Only coursework in foreign languages that is numbered above 2100 is applicable, and the maximum number of such credit hours is 6. A grade of C- or higher must be earned in each course, and students must maintain a cumulative GPA of 2.0 for overall coursework counting towards the certificate. Consistent with MU policy on certificates, an undergraduate degree and certificate must be awarded simultaneously.

\* Contact Rebecca Martínez, Coordinator, Multicultural Studies Certificate, at [martinezr@missouri.edu](mailto:martinezr@missouri.edu) for a list of approved courses and approval of applied experience.

## Minor in Peace Studies

A minor in peace studies requires a minimum of 15 credits. PEA\_ST 1050 Introduction to Peace Studies is required, plus 12 additional credits. Online writing intensive versions of 1050 are available. It is recommended that at least six of the credits be drawn from the following list:

### Area 1: International and Civil War and Peace

PEA\_ST 2200 Nuclear Weapons: Environmental, Health and Social Effects

PEA\_ST 2410 Philosophies of War and Peace

PEA\_ST 3230H Terrorism and Conflict Resolution - Honors

PEA\_ST 3610 Ireland, 1100s to 1850

PEA\_ST 3611 Ireland, 1850-1923

PEA\_ST 3612 Ireland, 1920-Present

PEA\_ST 4331 Nonproliferation Issues for Weapons of Mass Destruction

### Area 2: Global Social and Environmental Justice

PEA\_ST 1120 Population and Ecology

PEA\_ST 2000 Exploration in Social and Economic Justice

PEA\_ST 2284 Critical Dialogs: Global Environmental Policy Conflicts

PEA\_ST 2285 Large Corporations, Economic Crisis, Social Responsibility

PEA_ST 3401	Global Health	
PEA_ST 3600	Criminology	
PEA_ST 3870	Social Revolution in Latin America	
<b>Area 3: Nonviolent Social Movements, Process, and Change</b>		
PEA_ST 2182	Critical Dialogues: Nonviolence in Peace/ Democracy Movements	
PEA_ST 3520	Collective Behavior	
PEA_ST 3521	Group Decision Making Processes	
PEA_ST 3522	New Media, Conflict and Control	
PEA_ST 4341	Building Communities from the Grassroots	
<b>Area 4: Cultures, Intellectuals, And Global Migration</b>		
PEA_ST 2280	Race, Democracy, and Violence in Cuba and Haiti	
PEA_ST 2320	Spanish Literature in Translation	
PEA_ST 3140	Art of War and Peace	
PEA_ST 3400	Politics of the Media	
PEA_ST 3780	World Political Geography	
PEA_ST 4600	Political and Social Philosophy	
PEA_ST 4830	Journalism and Conflict	
<b>Area 5: Indigenous Peoples, Human Rights, and The Imperial State</b>		
REL_ST 2100	Indigenous Religions	
ENGLSH 2490	Introduction to Native Studies	
ENGLSH 3490	Native Writing and Representation	
GEOG 3560	Native American Geographies	
PEA_ST 4550	Gender and Human Rights in Cross Cultural Perspective	

## Minor in Romance Literatures in Translation

To obtain a minor in Romance Literatures in Translation, students must complete the basic language sequence shown below.

SPAN 1100 & SPAN 1200 & SPAN 2100	Elementary Spanish I and Elementary Spanish II and Elementary Spanish III	13
or FRENCH 1100 & FRENCH 1200 & FRENCH 2100	Elementary French I and Elementary French II and Elementary French III	
ITAL 1100 & ITAL 1200 or PORT 1100 & PORT 1200	Elementary Italian I and Elementary Italian II Elementary Portuguese I and Elementary Portuguese II	10-12

Students must also complete three 2000-level literature-in-translation courses and two 3000-level literature-in-translation courses (one of which must be either ITAL 3310 or PORT 3001) chosen from the list below:

FRENCH 2320	French Literature and Thought in English Translation I	3
FRENCH 2330	French Literature in Translation II	3
FRENCH 2350	New World Francophone Literature in Translation	3
FRENCH 2370	French Women Writers (in translation)	3
ITAL 2850	Italian Cinema	3

ITAL 3310	20th Century Italian Fiction in Translation	3
ITAL 3820	Films of Federico Fellini	3
PORT 3001/3005	Topics in Portuguese-General	1-3
SPAN 2320	Spanish Literature in Translation	3
SPAN 2340	Hispanic Minority Literature	3

Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the minor.

## Minor in South Asian Studies

The South Asian Studies minor is a course of study that allows a student to acquire specialized knowledge about South Asia in a variety of disciplines, e.g., anthropology, history, philosophy, religious studies, political science, sociology, women and gender studies and language studies.

To obtain a minor in South Asian Studies, a student must:

- Complete 15 hours of coursework relating to South Asia. The courses approved for the South Asian Studies minor are listed at <http://southasia.missouri.edu/minor.html>.
- At least nine of the 15 hours must be at the 2000 level or above.
- A student is required to take courses in two or more departments.
- A minimum of six hours must be taken in residence.
- A grade of C or better is required for all courses counting toward the South Asian Studies minor.

A minor in South Asian studies can easily be combined with a major in anthropology, philosophy, history, religious studies, political science, geography, journalism, sociology, women & gender studies, etc.

## Minor in Spanish

Students may obtain a Spanish minor by completing a minimum of 15 credits beyond SPAN 2100, of which at least 6 credits must be in literature. Courses taught in English and cross-listed courses taught in English do not count toward the minor. The courses listed below are the most likely choice.

SPAN 2160	Intermediate Spanish Composition and Conversation	3
SPAN 3150 or SPAN 3721	Advanced Spanish Conversation Spanish Phonetics	3
SPAN 3160 or SPAN 3280	Advanced Spanish Composition Commercial Spanish	3
SPAN 3420	Introduction to Hispanic Literature I	3
SPAN 3430	Introduction to Hispanic Literature II	3

Students beginning at a level higher than SPAN 2160 due to placement testing must still complete the minimum of 15 additional credits to receive the minor. A minimum of 9 credits, including 3 in literature, must be taken in residence.

Additionally, course work must be completed with a grade in the C range or higher in each of the required courses and students must maintain a 2.0 GPA in the minor.

## Minor in Strategic Studies

For general questions about the minor, contact:

Stephen Quackenbush, Program Director  
573-882-2082  
quackenbushs@missouri.edu

Lindsey Hagglund, Academic Advisor  
573-882-2580  
HagglundL@missouri.edu

The minor in Strategic Studies is designed for those students who wish to acquire the knowledge and analytical skills that are critical for working in a career field related to national security. The minor is appropriate for students of almost any major, particularly political science, economics, history, geography, journalism, and engineering. The program is also well suited for students in Army, Navy, or Air Force ROTC, providing a solid background for officers encountering the changing strategic environment of the twenty-first century.

The program affords students a unique opportunity to gain a broad perspective on security issues, allowing focus on areas where they may have additional educational requirements not offered in their chosen major field of study. Students may work for the defense department, national intelligence agencies, or other federal agencies, or any number of jobs related to security in the private and non-profit sectors.

Fifteen (15) credits are required for the minor in strategic studies, selected from the list below. Of these, six hours must be from political science, and three hours must be from military science. Students in the minor must maintain a B average (3.0 GPA) for courses in the minor.

### Select from the courses below

POL_SC 4410	Politics and War	3
POL_SC 4411	Genocide, Terrorism and Civil War	3
POL_SC 4412	Strategy and Warfare	3
POL_SC 4540	American Foreign Policies	3
MIL_SC 3160	Death by a Thousand Cuts: Counterinsurgency/ Insurgency the American Experience	3
MIL_SC 3161	The American Experience in Vietnam	3
MIL_SC 3162	Counterinsurgency in Asia	3
MIL_SC 3163	U.S. Military History in the Western Tradition	3
HIST 4080	American Foreign Policy from Colonial Times to 1898	3
HIST 4250	U.S. Foreign Relations, 1898-1945	3
HIST 4260	The Age of Ascendancy: U.S. Foreign Relations, 1945 - Present	3

As part of the program, new courses are being developed in areas such as coercive diplomacy and human security.

## Minor in Women's and Gender Studies

A Women's and Gender Studies minor can be a component of any undergraduate degree granted at MU.

The curriculum includes women's and gender studies core courses as well as cross-listed courses from several departments throughout the University. These courses assume that knowledge cannot be

separated from the study of women and gender, and that gender and sexuality are fundamental categories of analysis in all disciplines. The department stresses interdisciplinary scholarship and teaching that are broadly comparative and range across multiple cultures, national and transnational contexts, and historical periods. Its faculty employ a broad range of theoretical approaches and methods.

When students graduate with a Women's and Gender Studies minor they should be able to:

- Apply cross-cultural and global awareness to "big questions" about women and gender
- Have a comprehensive grasp of intersectionality and matrices of domination
- Think critically: i.e. consider an issue from multiple perspectives; locate, evaluate and interpret diverse sources, including statistics; engage in critical self-reflection
- Construct arguments with evidence obtained from research
- Work collaboratively
- Recognize sexist/racist writing and thinking
- Connect knowledge and experience, theory and activism, Women's and Gender Studies materials with other courses
- Communicate effectively in writing and speech
- Apply knowledge for social transformation, citizenship
- Use gender (and other identity categories) as a category/ies for analysis

A student minoring in Women's and Gender Studies is required to fulfill all requirements for their major degree program, and in addition complete at least 15 credits of Women's and Gender Studies courses, including:

WGST 1120	Bodies, Cultures, and Nations	3
WGST 2010	Gender and Identity: Understanding Intersectionality	3
Additional WGST credits numbered 2000-level or above		6
Additional WGST elective credits		3

## Graduate

### Graduate Minor in Black Studies

#### Contact Information

Black Studies Program  
313 Gentry Hall  
573-882-6229  
<http://blackstudies.missouri.edu/>

#### About the Black Studies Program

The central mission of the Black Studies Program is to prepare students to critically understand, conduct research, and interpret the complex histories, societies, and cultures of people of African descent in the United States, Africa and the Diaspora.

The Program's interdisciplinary design encourages specialization within the University of Missouri's broad liberal arts curriculum. As a result, students and faculty may conduct research that develops new or builds upon existing concepts, theories, and approaches to the study of the evolving experiences and contributions of the African Diaspora. In so doing, Black Studies prepares students to competently participate in

diverse and competitive global societies where they may contribute viable practical solutions to critical challenges on multiple levels.

## Affiliates of the Black Studies

The Black Studies Program encourages the use of multicultural curriculum throughout many different departments. Faculty members and affiliates of the program design new ways to incorporate topics of Black Studies in their courses. Programs affiliating with Black Studies include art, educational leadership and policy analysis, English, history, human development and family studies, journalism, law, music, political science, religious studies, romance languages, sociology, theatre, and women & gender studies.

## Resources

The Walter Daniel Resource Center is supported by a foundation set up by the estate of the late Dr. Walter C. Daniel. Dr. Daniel came to MU in 1973 as the University's first Vice Chancellor. He was instrumental in helping reorganize the University's administration. However, his success as an administrator never overshadowed his love of teaching and working with students. Located in 328 Gentry Hall, the books, periodicals, reference materials and media resources in this center will supplement and complement existing university resources on the histories, cultures, and societies of people of African descent in Africa, the U.S., and throughout the Diaspora available to the University community. Additionally, the center houses Dr. Daniel's extensive private library of African American literature, as well as an extensive collection of primary and secondary sources including numerous periodicals and scholarly journals. The library also offers a small video collection which can be viewed on site. At the present time the library is a read-only research facility.

## Plan of Study

An individual program of specialization in Black Studies may be arranged within the framework of a conventional graduate degree in any one of several fields. The options within a regular degree program are employed to include maximum exposure to courses emphasizing the multicultural histories, cultures, and societies of people of African descent in Africa, the U.S., and throughout the Black Diaspora. Courses outside the major department, but in related fields, are incorporated into the student's study plan. Students interested in pursuing a Black Studies specialty within their chosen fields should consult a departmental advisor, who is an affiliate of the Black Studies Program, to assist in course selection. Lacking such an advisor, students should contact the Director of the Black Studies Program for assistance or send an email to Mary Beth Brown in the Black Studies Program.

## Graduate Certificate in Jazz Studies

The Graduate Certificate in Jazz Studies is a one-year program that provides opportunities for continued development of skills in jazz-specific areas, such as improvisation, pedagogy, and arranging. The certificate is available to degree-seeking and non-degree seeking students alike, non-music as well as music majors, and is designed as an intensive into jazz performance. The program will deepen the student's preparation for a career in jazz performance or prepare the student for further study in jazz.

## Graduate Certificate in Life Span Development

Dr. Nicole Campione-Barr, Coordinator  
 Lifespan Development Graduate Certificate Program  
 204D McAlester Hall  
 email: [campionebarrn@missouri.edu](mailto:campionebarrn@missouri.edu)  
 phone: 884-1681

### About the Certificate (Educational Objective)

Developmental psychology and lifespan developmental studies include the scientific study of psychological changes that occur over the life course. Therefore, developmental studies are inherently interested in many of the same questions of other areas of psychology, education, family studies, etc., but by investigating the ways in which particular psychological processes change and develop from infancy to adolescence, and through to adulthood. The purpose of the graduate certificate in lifespan development is to provide students in other areas of psychological study, or human behavior broadly defined, a better understanding of the ways in which psychological functions change with age, as well as the challenges and special considerations that are a part of research with children and adolescents and how they may be different from those of working with adults.

### Plan of Study

The requirements for acceptance and completion of work for the certificate are as follows:

- 1) The student must be enrolled and in good standing in a doctoral-level program at MU (available to degree-seeking students only).
- 2) A request to be included in the certificate program must be made in advance of final completion of courses to Nicole Campione-Barr, PhD. This can be done via e-mail or hard copy, however, the request must also be approved by the student's major advisor.
- 3) A formal plan of study must be submitted to the Graduate School no later than the semester prior to graduation. This must be signed by the certificate coordinator (Nicole Campione-Barr) and the director of graduate studies of the student's major department.
- 4) Students must complete a minimum of 15 credit hours to be awarded the certificate, following the below guidelines:

**Core Courses: students are required to take 3 core courses**

PSYCH 8410	Psychology of Development	3
or H_D_FS 8210	Theories of Human Development	
PSYCH 8420	Cognitive Development	3
or H_D_FS 8420	Cognitive Development	
PSYCH 8440	Social and Emotional Development	3
or H_D_FS 8440	Social and Emotional Development	
<b>Electives*</b>		<b>6</b>

Options within the Department of Psychological Sciences, and Human Development and Family Studies are listed below. Other pre-approved options are listed and include courses in Communication Sciences and Disorders, Educational School and Counseling Psychology, Social Work, and Special Education. Courses other than those listed may be appropriate, but should be approved prior to registration.

Developmental psychology such as PSYCH 7420
PSYCH 9440 Studies in Developmental Psychology
PSYCH 8050 Research in Psychology - Non-Thesis
PSYCH 9050 Research in Psychology - Non-Dissertation
H_D_FS 8012 Family Dynamics and Intervention
H_D_FS 8110 Developmental Perspectives on Health and Illness
H_D_FS 8220 Family Theories
H_D_FS 8300 Advanced Seminar on Multicultural Families
H_D_FS 8450 Adolescence and Emerging Adulthood
H_D_FS 8460 Life Course Perspective
H_D_FS 8470 Identity Development
H_D_FS 8610 Remarriage & Stepfamilies: Development, Dynamics, & Intervention
H_D_FS 8630 Gendered Relations in Families
H_D_FS 8640 Family Interaction
H_D_FS 8710 Children, Families and Public Policy
H_D_FS 8770 Poverty
H_D_FS 8085 Problems in Human Development and Family Studies
H_D_FS 8090 Research in Human Development and Family Studies
ESC_PS 7160 Developmental Aspects of Human Learning
ESC_PS 8015 Child and Adolescent Development
ESC_PS 8580 Social and Cultural Identity Development
ESC_PS 8135 Foundations of Career Psychology
C_S_D 7810 Psycholinguistics
C_S_D 7830 Individual Differences in Language Processing
C_S_D 7840 Language and Development in Infancy
SOC_WK 7360 Working with Minority Youth
SOC_WK 7390 Helping Strategies With Children and Adolescents
SPC_ED 7325 Language Development of Exceptional Students
SPC_ED 8340 Advanced Studies in Developmental Disabilities

5) When needed, advising will be provided to students by lifespan development certificate coordinator (Nicole Campione-Barr), in conjunction with the student's major advisor.

## Need for Certificate Program

For students within the child clinical psychology Ph.D. program of study there is a need for some students to gain greater exposure to developmental studies. Currently, the department of Psychological Sciences offers a dual child clinical and developmental psychology degree program. This program is extremely rigorous, however, and students and faculty within the Department of Psychological Sciences have identified a need for more in-depth study in developmental science without the commitment of a second degree. In creating

the certificate program, however, it was determined that graduate students in other related fields may also wish to pursue further study in lifespan development. In particular, students in education, social work, communication science and disorders, and additional areas within psychology may benefit from greater understanding of developmental processes which could be gained through the required and elective course work outlined in this certificate program.

## Impact on Current Programs of Study

The impact to current programs of study is expected to be relatively minimal other than the inclusion of potentially a few more students enrolled in the aforementioned classes.

## Advisory Committee Members

Debi Bell, Psychological Sciences  
 Nicole Campione-Barr, Psychological Sciences  
 Marilyn Coleman, Human Development & Family Studies  
 Larry Ganong, Human Development & Family Studies  
 Jean Ispa, Human Development & Family Studies  
 Amanda Rose, Psychological Sciences

## Participating/Affiliated Faculty - Various faculty from the following departments:

Psychological Sciences  
 Human Development and Family Studies  
 Communication Science and Disorders  
 Educational, School, and Counseling Psychology  
 Special Education  
 Social Work

## Graduate Minor in Medieval and Renaissance Studies

**Considering a graduate MARS minor?** While most students still choose to study in a traditional disciplinary framework, a MARS minor allows students to expand the breadth of their studies and research by taking coursework in over 11 different departments on campus. So much of the research on the Middle Ages and the Renaissance is interdisciplinary in nature, and the MARS minor helps students gain expertise in areas outside of their home discipline while simultaneously offering a quick and comprehensive way for prospective employers to understand their specialization and background.

**Requirements:** Courses that may be applied toward this minor are taught by faculty members from the departments of Art History and Archaeology, Classical Studies, English, Germanic and Russian Studies, History, Music, Philosophy, Religious Studies, and Romance Languages and Literatures. Under certain circumstances, a minor in Medieval or Renaissance studies may also be arranged for MA programs. A student must be accepted for advisement by the major department. Then, in consultation with the major advisor, who must be a specialist in the medieval or Renaissance period, an interdisciplinary curriculum for the minor is prepared and submitted to the Medieval and Renaissance Studies Committee for approval.

- A doctoral candidate in one of these departments offering a PhD may elect a minor concentration in interdisciplinary Medieval or Renaissance Studies by taking at least three appropriate courses outside the department, as well as all appropriate ones within it.

Thus one earns, for example, a PhD in Art History and Archaeology with specialization in Medieval Studies, or a PhD in History with specialization in Renaissance Studies.

- At least nine (9) hours in relevant 7000 or 8000 level courses outside the major department are required to constitute the minor.
- Because the program places considerable emphasis on foreign languages, all doctoral candidates must study at least two languages.

**Perks:**

- The Newberry Library Center for Renaissance Studies consortium
- MU graduate Association for Medieval and Renaissance studies
- Renaissance reading group
- A listserv announcing campus-related activities for MARS members

For more information contact:

Dr. Emma Lipton  
 Chair of MARS  
 liptone@missouri.edu

## Graduate Minor in Museum Studies

This minor, offered by the Museum of Art and Archaeology and the Department of Art History and Archaeology, provides students with a systematic introduction to the history, philosophy, and role of museums. The program blends academic theory with practical experience to provide students with an opportunity to build a foundation applicable for work in either university or public museums.

**Curriculum:** The program comprises six courses designed to introduce students to the history and role of museums in society; to the philosophical, legal and administrative issues that face the modern museum; and to the exhibition and preservation skills required of a museum curator. The emphasis of the program is on museum management, curatorial responsibilities (collections management and exhibition) and educational interpretation. Internships and field trips to local museums provide additional insight into the world of museum professionals.

- Individual courses are listed under the Department of Art History and Archaeology. Successful completion of the program is accomplished through 12 credit hours of required course work, including AR\_H\_A 7130, AR\_H\_A 8130 and AR\_H\_A 7980, and is recognized when the student successfully completes an M.A. in his or her academic field of study. An individual's course of study will be arranged with the program director.
- The minimum period required to complete the minor is four semesters, or three semesters and one summer. Courses are open to advanced undergraduate students, but admission to the program is open only to those who have completed a BA degree.

**Admissions:** Students who undertake the museum studies minor are normally already enrolled as graduate students in degree-granting academic departments. Students should apply at the beginning of the fall semester to the Director of Graduate Studies, 109 Pickard Hall, for admission to the program.

## Graduate Minor in Psychological Statistics and Methods

The Minor in Psychological Statistics and Methods is a joint program between the Department of Psychological Sciences and the Department of Statistics.

A total of seven courses at the 7000 level or above in statistics and methods is required. The course options are dependent on the doctoral program in which the student is admitted. More detailed specification of the courses required in the plan of study may be stipulated by the student's major department and the student should consult with them in this regard.

**Doctoral students in the Department of Psychological Sciences or Statistics** must take at least two of the seven required courses outside their major department.

**A grade of B or better is required in the following courses:**

PSYCH 9710	Multivariate Statistics in Psychology	3
PSYCH 9720	Latent Variable Models in Statistical Analysis	3
PSYCH 9715	Multilevel Modeling	3

**Quantitative Psychology - one of the following is required:**

PSYCH 9520	Psychometrics	3
PSYCH 9725	The Literature Review	3
PSYCH 9750	Advanced Structural Equation Modeling	3
PSYCH 9760	Categorical Data Analysis	3
PSYCH 9735	Psychological Process Models	3

**Two approved courses at the 7000 level or above in the Department of Statistics, Mathematics, or in other departments provided those courses are primarily statistics-oriented or methods-oriented. \***

\* The following courses **cannot** be used to fulfill minor requirements: STAT 7050, STAT 7510, STAT 7530, STAT 7560, STAT 4970, STAT 7020, STAT 7070, STAT 8220, STAT 8370.

Doctoral students in other departments must take five courses within the Department of Psychological Sciences or the Department of Statistics, at least two of which are in statistics and two of which are in psychology.

Questions regarding the minor in Psychological Statistics and Methods should be directed to:

Phil Woods  
 Training Area Director  
 philipkwood@gmail.com

## Graduate Certificate in Science Outreach

The educational objectives of the Certificate in Science Outreach Program are to teach students how to integrate research and outreach, and how to facilitate a dialogue with the lay public. Course work will concentrate on increasing the ability of students to communicate science to broad audiences of different ages and different levels of education. Practice and application of outreach will develop the "broader impacts" component of the research, and will emphasize actual interaction with audiences, to promote understanding and appreciation of science, and support for scientific research.



Required Courses:

BIO_SC/AN_SCI 8725/PHYSICS 8350/LTC 8725	Science Outreach: Public Understanding of Science	1-2
LTC/BIO_SC 8726	Integrating Science with Outreach	1-6
LTC/BIO_SC 8724	College Science Teaching	3

For more information, contact the certificate Co-Directors:

Anna Waldron  
573-882-2737  
waldrona@missouri.edu

Gavin King  
573-882-3217  
kinggm@missouri.edu

## Graduate Minor in Women's and Gender Studies

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### Contact Information:

Joan Hermesen, Chair  
Mary Jo Neitz, Director of Graduate Studies  
325 Strickland Hall  
(573) 882-2703

### Eligibility for Minor

The Women's and Gender Studies Graduate Minor is available to all students pursuing a graduate degree at MU.

### Plan of Study

15 credit hours will be chosen to complement the student's main area of graduate study. Students may take up to six hours in their home department. Students will gain expertise in the methodologies and theories in Women's and Gender Studies.

The minor requires the following six credit hours:

WGST 8020	Graduate Feminist Theory	3
WGST 8040	Seminar: Problems and Issues in Feminist Scholarship	3

For lists of permanent courses and current offerings, visit <http://wgst.missouri.edu/graduate/index.html>.

## Robert J Trulaske, Sr. College of Business

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### Administration

Joan T. A. Gabel, Dean  
Stephen Ferris, Associate Dean  
Mary Beth Marrs, Associate Dean  
Jeff Wiese, Assistant Dean  
Joseph Stephens, Assistant Dean  
Vairam Arunachalam, Director, School of Accountancy  
Dan French, Chair, Finance Department  
Doug Moesel, Chair, Management Department  
Murali Mantrala, Chair, Marketing Department

### Contact Information

110 Cornell Hall  
(573) 882-6346

The Robert J. Trulaske Sr., College of Business, established in 1914, educates students for professional opportunities and responsibilities in the private and public sectors. The college includes the School of Accountancy (the first established at a major public university) and the departments of Finance, Management and Marketing. The college offers an undergraduate degree in business administration, a combined bachelor's and master's degree program in accountancy, master's degrees in business administration, and doctoral degrees in accountancy and business.

Students' educational experiences are enhanced through the scholarly activities of the faculty, who conduct research on significant, timely issues. Students in the college are exposed to relevant theories and concepts applied to real-world operations of private and public enterprises. Students gain added practical insights through internships, field projects, guest speakers and executives-in-residence. The college's agencies provide information, research, continuing education and managerial assistance to practitioners and organizations throughout Missouri and in other states.

The Trulaske College of Business accepts CLEP subject examinations, departmental exams and Advanced Placement (College Board) credit. More information may be obtained from academic advisors in the undergraduate Trulaske College of Business and the Credit by Examination section in the beginning of this catalog.

### Department of Finance

Through the study of finance, students learn to independently analyze security markets, understand the basic valuation techniques and use their knowledge to make investment decisions. In addition, students learn basic theoretical concepts in corporate finance and their application to corporate financing and investment decisions. Course work focuses on the areas of investments, portfolio management, real estate appraisal, financial institutions and corporate finance.

### Department of Management

Management is defined by the Academy of Management as including "all processes, structures, and behaviors that are related to the work of organizations, as well as the dynamics of industries, economies,

and other environmental forces that affect organizations and their employees." Management course work at MU is quite diverse, covering the areas of human resource management, human behavior in organizations, organization theory, strategic management, entrepreneurship, information systems, e-commerce, operations management and business law.

### Department of Marketing

Marketing focuses on creating and managing customers. It deals with the strategies, tactics and business processes involved in researching markets, deciding which markets and segments to pursue, identifying what unique value to provide, and then assembling the products, services, people and partner firms needed to build, communicate and deliver that value.

### Exploratory Course

Students wanting to explore business administration as a major should take MANGMT 1010 (p. 339) Contemporary Business Practices.

### Double Emphasis

Students may have a dual emphasis of Finance and Real Estate, or may add on an economics emphasis to any other BSBA emphasis program.

### Undergraduate

- Admissions
- Degree core Requirements
- Academic Regulations
- Enrolling in Other Institutions
- Advising
- Business Career Services
- Professional Development Programs

### Admissions

#### Freshmen

Freshman applicants to the Robert J. Trulaske Sr., College of Business (students applying to MU from high school) will be admitted to the lower division if they meet campus admission requirements. Admission to the lower division does not guarantee admission to the BSBA degree program and emphasis areas or the Accountancy program. Admission to an upper-level emphasis area is based on the UM cumulative grade of record, successful completion of the business and professional core courses, and completion of the Professional Development requirements.

#### Transfer Students

Students in good standing in another school or college at MU must submit a Transfer of Division form to the Trulaske College of Business. Such students may be admitted to the lower division if they can complete degree-program admission requirements by the completion of 60 credits (60 credits for Accountancy students).

External transfer students who request admission to the Trulaske College of Business will be admitted to the lower division if they can complete degree-program admission requirements by the completion of 60 credits. Students are encouraged to have their transcripts evaluated by an academic advisor in the Trulaske College of Business prior to their enrollment at MU.

Course work completed with a grade of D- or better at an accredited two- or four-year institution will be accepted if the courses are appropriate equivalents of the required MU courses and if the equivalent MU courses do not require a grade in the C range. Only six hours of business course work at the 3000-level can be transferred for the degree requirements. The college does not accept developmental or vocational/technical course work.

Credits transferred from accredited community or junior colleges usually include general education, upper level or pre-accountancy admission requirements and unrestricted elective courses. The Trulaske College of Business accepts a maximum of 64 credits from a community or junior college toward the bachelor's degree. When more than 64 credits have been completed, the additional courses are evaluated on a course-by-course basis for applicability to lower-division requirements.

A student holding an associate of arts degree from an accredited Missouri Community College will have fulfilled general education requirements (p. 18). However, this does not exempt the student from satisfying the specialized degree, major or emphasis prerequisites of the college in the areas of accounting, economics, math and statistics.

Students transferring to the college without an associate of arts degree will have their transcripts evaluated on a course-by-course basis and must meet the entrance requirements of the college in the same way as other MU students. Students transferring to the Trulaske College of Business will be required to meet the Professional Development requirements based on the earliest semester of continuous enrollment in college after high school graduation.

## Probationary Admissions

Students are placed on academic probation if they are admitted to the college without fully meeting the good-standing requirements of the school. (See the section on Probation Suspension and Dismissal (p. 316) for these requirements.)

## Degree Core Requirements

### Credit Hour Requirements

In addition to University general education (p. 18) and graduation requirements, students must meet the following requirements:

- Students must complete a minimum of 120 credits from accredited colleges or universities for all BSBA emphasis areas except International Business, which requires 136-141 credits. (See separate section for international business major requirements.) Additionally, the joint BSACC and the MAcc degree program requires students to complete a minimum of 150 credit hours.
- In completing the 120 credits for graduation, students may count no more than 30 credits within their emphasis area.

A student who has a degree in another curricular area may receive a Bachelor of Science in Business Administration degree upon completion of all requirements for the degree.

## Professional Development Program

In addition to completing required coursework to earn a Bachelor of Science, Business Administration degree, students must fulfill the requirements of the Professional Development Program (PDP). The goal of the PDP is to offer opportunities to all BS BA and Accounting students to develop core competencies and values necessary for success in their professional careers.

As a graduation requirement, the program is comprised of the following:

- Completion of designated professional activities to acquire points for admission to the upper division. Once admitted to the upper division, students will continue to earn points to meet the graduation requirements. Specific activities may be required.
- Completion of BUS\_AD 3500 (p. 326) the semester immediately following admission to the upper division. This course is a pre-requisite to the completion of the required BUS\_AD 4500 (p. 326). These two courses cannot be completed concurrently without prior approval. BUS\_AD 3500 (p. 326) must be completed in residence.
- Completion of BUS\_AD 4500 (p. 326) once admitted to the upper division. This will include completion of a professional level internship/practicum experience. Internships/Practicums can be completed over a summer or semester-long period of time (intercession assignments will not meet the PDP requirement). Students must seek final approval of their internship/practicum experience from the PDP Director before beginning the assignment. BUS\_AD 4500 (p. 326) must be completed in residence.

If a student fails to meet the requirements of the PDP at either the lower or upper division, the student will not be allowed to continue in or graduate from the Trulaske College of Business.

## Professional Development Graduation Requirement

- The student must earn a minimum of 70 PDP points (maximum of 100) at the lower division for official admittance to the upper division. Once admitted, students must earn a total of 200 PDP points to meet the requirement.
- The student must earn a C- (or higher) in BUS\_AD 3500 (p. 326) to satisfy the requirement.
- BUS\_AD 4500 (p. 326) is graded as Satisfactory/Unsatisfactory. Students must complete practicum course to a satisfactory level of 70% or greater to receive a passing grade for the course

## Capstone

Students must complete MANGMT 4970 Strategic Management to meet the capstone requirement. Students must earn a C- or better to earn credit for this course in order to graduate.

## Required Work in Residence

Students must complete 30 of the last 36 hours of courses in residence at MU, enrolled in the Trulaske College of Business.

## Latin Honors

Graduation with Latin Honors is determined by grade point average from either the last 50 undergraduate credits in the UM system or overall UM System undergraduate credits, whichever is higher. Grade point average requirements for Latin Honors are 3.5 for *cum laude*; 3.7 for *magna cum laude* and 3.9 for *summa cum laude*.

## Academic Assessment

Students are required to complete a college-wide assessment exam in addition to a University assessment exam during their capstone course.

## Academic Regulations

### Credits by Examination

The Trulaske College of Business accepts CLEP subject examinations, departmental exams and advanced placement (College Board) credit. More information may be obtained from academic advisors in the Trulaske College of Business and the Credit by Examinations section (p. 660).

### Maximum Credits Enrolled

A student with a cumulative GPA of 3.0 or higher may register for more than 18 credits for a fall or spring term, with permission of the assistant dean of undergraduate programs.

### Independent Study

Contact Mizzou Online (self paced) for a listing of courses that may be taken online. A student may take no more than six hours of 3000 or higher business courses through Mizzou Online (self-paced), excluding BUS\_AD 4500.

## Probation, Suspension and Dismissal

### Grade Point Average Requirements

Minimum GPAs must be maintained in the following categories to remain in good standing with the Trulaske College of Business:

- Students in the Upper Level for Business must maintain a 2.50 GPA in all MU accounting and business courses. Students in the Upper Level Accountancy, must maintain a 3.0 GPA in order to graduate.
- All students must earn a 2.00 term and cumulative GPA on courses completed in the UM System.

### Probation

See the Academic Standing (p. 660) section of this catalog.

- A student in good academic standing whose term GPA subsequently falls below 2.0 but is 1.0 or above (0.5 or above for a first term Freshman) is placed on academic probation.
- A student whose cumulative GPA for courses offered by the Trulaske College of Business is below a 2.0 is placed on probation. (Courses offered by the college are those with the curricular designations of ACCTCY, BUS AD, ECONOM, FINANC, MANGMT and MRKTNG.) This only applies to students admitted to an upper level BSBA emphasis.
- A student placed on academic probation must establish a 2.0 term GPA, a 2.0 UM System cumulative GPA and a 2.0 MU Trulaske College of Business cumulative GPA within two successive terms of enrollment; otherwise, the student is ineligible to enroll.
- Students placed on probation may become ineligible to enroll in the Trulaske College of Business at the end of the first term of probation if they become subject to one or more of the first three dismissal provisions below.

## Dismissal

See University requirements outlined in the Academic Standing (p. 660) section of this catalog.

Students become ineligible to enroll in the Trulaske College of Business if one or more of the following occurs:

- The fall or spring term GPA falls below 1.0.
- For a student who has been admitted to upper level, the cumulative GPA for courses offered by the Trulaske College of Business is below a 2.0 GPA. This includes all MU accountancy and business courses regardless of whether the courses are completed before or after admission to a BSBA emphasis area.
- The student fails to remove probationary status at the completion of the second successive term on probation (summer terms excluded).

A student who has been ineligible to enroll for a period of one year may be readmitted only on the approval of the assistant dean of the college. As a condition of readmission, the assistant dean may set forth stipulations about minimum standards of academic work that must be maintained by the student. After readmission, if the student again becomes ineligible to enroll, his or her ineligibility is considered permanent.

## Satisfactory/Unsatisfactory Grades

The S/U grading system is limited to unrestricted elective courses or courses only offered with a S/U grade.

## Enrolling in Other Institutions

The Trulaske College of Business has no restrictions on a student enrolling in another institution simultaneously as long as university residency requirements are met.

A student may take no more than six credit hours of online or transfer business course work at the 3000-level or higher.

## Advising

Academic Advising Contact  
Undergraduate Advising Office  
111 Cornell Hall  
(573) 882-7073  
businessadvising@missouri.edu

Students admitted to a degree program in the college are assigned an academic advisor. The academic advisor works with students in determining course work needed to complete a degree. In addition, students are assigned a faculty advisor in their emphasis area who can assist with career planning and selection of professional electives and emphasis support courses. Students are responsible for determining an appropriate schedule of courses each semester and are encouraged to meet with their academic advisor for assistance.

## Business Career Services

Business Career Services (BCS) is a valuable resource for all levels of TCoB students. BCS provides students individual career coaching, guidance and advice in areas such as resume and cover letter construction/revision, mock interviews, interview preparation, salary negotiations, and much more. Business Career Services partners with

numerous companies serving as a liaison to bridge employer with employee. BCS sponsored events such as Corporate Visit Days and Emphasis Panel (Accountancy, Finance & Banking, Management, Marketing, Real Estate, Sales, Entrepreneurial, Consulting, Government, Health Care, and Human Resources) provide students with firsthand knowledge of what is required to be competitive in the job market upon graduation from the Trulaske College of Business. All students are encouraged to register with BCS and begin utilizing these services as early as freshman year. BCS hosts three career fairs annually.

## Professional Development Program

The mission of the Professional Development Program is to provide every BSBA and lower division Accounting student with substantive professional development experiences during their degree program. Professional Development refers to activities, both inside and outside of the classroom, that provide students with the opportunity to develop and practice skills that are needed to perform successfully in professional roles after graduation. Students who graduate with a BSBA degree from the Robert J. Trulaske Sr., College of Business will have content knowledge and advanced professional competencies that are necessary for success in the business world.

## Graduate

Founded in 1914, the Robert J. Trulaske, Sr. College of Business enrolls about 350 graduate students as well as 4,000 undergraduates. The primary mission of the college is to prepare students to succeed in the world of business and to advance the body of knowledge about the world of business. The college has four academic units – Accountancy, Finance, Management, and Marketing – with 64 full-time faculty members.

The Trulaske College offers PhD degrees in both accountancy and business administration, an MBA degree, a 150-hour program that confers both undergraduate and master's degrees in accountancy, and an undergraduate degree in business administration. Over time, the college's degree programs and faculty research productivity have earned national acclaim.

The college takes great pride in its graduates. More than 31,000 alumni are contributing their expertise to the public and private sectors in every state in the U.S. and in a host of foreign countries. The Trulaske College's graduate-level degree programs, dual degrees, and certificates are described below.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Accountancy

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Vairam Arunachalam, PwC/Silvoso Distinguished Professor and Director,  
School of Accountancy

Phyllis Moore, Director, 150-hour and Master of Accountancy Programs

Robert J. Trulaske, Sr. College of Business  
303 Cornell Hall  
(573) 882-4463

### Academic Advising Contact

Phyllis Moore  
303 Cornell Hall  
(573) 882-4463

### Scholarship Contact

Phyllis Moore  
Robert J. Trulaske, Sr. College of Business  
303 Cornell Hall  
(573) 882-4463

The accountancy program at the University of Missouri has long been nationally recognized for its excellence. MU accountancy faculty have published leading textbooks and research articles and have served at high levels in numerous professional accounting associations. The school offers a combined BSAcc and MAcc degrees.

Students wanting to explore accountancy as a major should take ACCTCY 2036.

## Admissions

Accountancy prepares students for the competitive field of accounting with a combination of classroom study, practical experience, and student organizations, all in a degree that is nationally recognized for its excellence. The bachelor of science and master of accountancy degree programs are merged into an integrated 150-hour curriculum to be entered into as a junior. A limited number of students may also be accepted into the MAcc-only program.

Admission decisions will be made at the end of the spring semester for *fall admissions only*. Meeting the minimum requirements does not guarantee admission. Admission cutoffs will be revised each year in order to control accountancy undergraduate enrollment at a limit that can be served with current authorized faculty staffing and still maintain program quality and meet accreditation guidelines. Students meeting the minimum requirements will be selected for admission based on their UM cumulative grade point average until the enrollment for that year is reached. A limited number of students may be selected by considering grades and other criteria such as demonstrated commitment, experience, leadership and other exceptional circumstances.

Students not admitted to the 150 credit hour degree program in the School of Accountancy may meet Trulaske College of Business admission requirements and transfer into a business administration emphasis area, depending on available space.

A student may take no more than six credit hours of 3000 or higher business courses through Mizzou Online or non-MU courses off campus, excluding BUS\_AD 4500. Study abroad courses are also excluded from this requirement.

## Faculty

**Professor** V. Arunachalam\*\*, J. R. Francis\*\*, I. K. Khurana\*\*

**Associate Professor** E. G. Mauldin\*\*, M. R. Pereira\*\*, K. W. Shaw\*\*

**Assistant Professor** M. Glendening\*, K. Kim\*, M. Subasi\*, Q. Zhao

**Teaching Professor** B. M. Cunningham

**Associate Teaching Professor** C. Prestigiacomo\*

**Assistant Teaching Professor** K. Hockman, P. Kleen, R. Wilson\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 320)
- BSAcc in Accountancy (p. 320)

## Undergraduate Level

Information on students who are admitted to MU and who indicate an interest in becoming accountancy or business majors is subsequently forwarded to the Undergraduate Programs Office of the College of Business (111 Cornell Hall, 573-882-7073). Qualified applicants with less than 54 semester hours of college courses completed will be admitted to the lower (pre-professional) level of the Trulaske College of Business. Applicants with more than 54 semester hours of college credit may be admitted to a specific upper (professional) level college of business program, e.g., the 150-Hour Accountancy Program, if they meet the program's admission requirements. Students who transfer into the Trulaske College of Business' upper or lower levels from another Mizzou school or college must submit a Transfer of Division form in order to be considered for admission.

The combined BSAcc/MAcc (150-hour) program is open to qualified undergraduate students at Mizzou as well as qualified undergraduates who transfer to MU from other colleges and universities. Interested students not already admitted to Mizzou should visit the Office of Admissions website (<http://admissions.missouri.edu/apply>). Undergraduate students are also responsible for completing all Trulaske College of Business requirements. These requirements can be found here (p. 314).

## Admission to the Joint BSAcc and MAcc Degree Program

In the School of Accountancy, the bachelor's and master's degree programs are merged into a 150-credit program. Students should be admitted to the BSAcc/MAcc degree program by the time they have completed 60 hours. The following program prerequisites are required for admission.

ACCTCY 2036    Accounting I\*  
(p. 318)                      and Accounting II \*  
& ACCTCY 2037  
(p. 318)

or ACCTCY 2136H (p. 318) & ACCTCY 2137H (p. 318)	Honors Accounting I and Honors Accounting II	
ECONOM 1014 (p. 318)	Principles of Microeconomics **	3
or ECONOM 1024 (p. 318)	Fundamentals of Microeconomics	
ECONOM 1015 (p. 318)	Principles of Macroeconomics **	3
ENGLISH 1000 (p. 318)	Exposition and Argumentation	3
MANGMT 1010 (p. 318)	Contemporary Business Practices	1
MATH 1100 (p. 318)	College Algebra	3
MATH 1300 (p. 318)	Finite Mathematics ***	3
MATH 1400 (p. 318)	Calculus for Social and Life Sciences I ***	3
STAT 2500 (p. 318)	Introduction to Probability and Statistics I***	3

- \* Both ACCTCY 2036 (p. 318) and ACCTCY 2037 (p. 318) must be taken in residence or both must be taken at another campus.
- \*\* ECONOM 1051H (p. 318) may be taken in place of ECONOM 1014 (p. 318)/ECONOM 1024 (p. 318) and ECONOM 1015 (p. 318)
- \*\*\* Needs a grade of C- or better in MATH 1300 (p. 318) or MATH 1400 (p. 318) and STATISTICS 2500.

**Minimum GPAs to be eligible to apply include each of the following:**

- 3.0 UM cumulative grade of record
- 3.0 GPA in ACCTCY 2036 (p. 318)/ACCTCY 2136H (p. 318) AND ACCTCY 2037 (p. 318)/ACCTCY 2137H (p. 318) (includes grades from other institutions)
- 3.0 GPA over the following pre-accountancy courses: (Including grades from outside UM System)

ACCTCY 2036 (p. 318) & ACCTCY 2136H (p. 318)	Accounting I and Honors Accounting I	3
ACCTCY 2037 (p. 318) & ACCTCY 2137H (p. 318)	Accounting II and Honors Accounting II	3
ECONOM 1014 (p. 318) or ECONOM 1024 (p. 318)	Principles of Microeconomics Fundamentals of Microeconomics	3
ECONOM 1015 (p. 318)	Principles of Macroeconomics	3
ENGLISH 1000 (p. 318)	Exposition and Argumentation	3
MATH 1300 (p. 318)	Finite Mathematics	3

MATH 1400 (p. 318)	Calculus for Social and Life Sciences I	3
STAT 2500 (p. 318)	Introduction to Probability and Statistics I	3

Students must also complete the Professional Development Program (PDP) point requirement for admission to the School of Accountancy and for graduation. Students must earn a minimum of 70 PDP points (maximum of 100) at the lower division for official admittance to the upper division. Once admitted, students must earn a total of 200 PDP points for graduation.

## Graduate

Robert J. Trulaske, Sr. College of Business  
 School of Accountancy  
 303 Cornell Hall  
 573-882-4463

**School of Accountancy Director:** Vairam Arunachalam  
**Director of 150 Hour and Master of Accountancy Programs:** Phyllis Moore  
**Director of PhD Program:** Jere Francis

- MAcc in Accountancy (p. 321)
- PhD in Accountancy (p. 322)

## About Accountancy Graduate Programs

The School of Accountancy offers graduate work leading to the master of accountancy and doctor of philosophy degrees. Graduate programs in accountancy prepare students for advanced professional careers in public, private and governmental accounting, and for careers in teaching and research.

Alert to change and recognizing that accounting education at the graduate level should be ahead of current practice, the School's programs require course work stressing advanced knowledge in accounting theory and practice, quantitative methods, economics and business. Opportunities exist on and off campus for exchanging ideas with practicing accountants and for participating in the solution of their professional problems.

Among the school's special facilities are a comprehensive collection of accounting and investment services, computer databases, technical journals and microfilm copies of annual reports, government documents and doctoral dissertations.

## Funding

Fellowships, scholarships and teaching and research assistantships are available to qualified graduate students.

## Undergraduate

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## Department Level Requirements - Accountancy

### Academic Standing - School of Accountancy

Accountancy students are in good academic standing if they maintain a cumulative UM grade point average of 3.0 or higher for all coursework subsequent to admission to the 150-hour Accountancy program. Failure to meet this requirement will result in a probationary semester, and if not rectified, dismissal from the program. Accountancy students are subject to the probation and dismissal policies (p. 314) set by the Trulaske College of Business. An undergraduate who has been ineligible to enroll for a period of one year may be readmitted only on the approval of the director of the 150-hour program in accountancy. As a condition of readmission, the director may set forth stipulations with regard to minimum standards of academic work that must be maintained by the student. After readmission, if the student again becomes ineligible to enroll, his or her ineligibility is considered permanent. Accountancy students entering the graduate portion of the 150-hour program should consult The Graduate School Catalog (<http://gradschool.missouri.edu>) for academic standing policies for graduate students.

### BSAcc in Accountancy

#### Major Program Requirements

The undergraduate and master's degree programs with a major in accountancy are merged into an integrated 150-credit curriculum to provide high-quality preparation for a career as a professional accountant in public accounting, business or government.

The Bachelor of Science with a major in Accountancy is awarded along with the Master of Accountancy degree upon satisfactory completion of the 150-credit, integrated curriculum. In this integrated program, a minimum of 24 credits in accountancy courses at the 3000-level or above must be completed at MU.

#### Major Core Requirements

The following courses are degree specific major requirements for the 150-credit program in the School of Accountancy. Courses that satisfy University general education (p. 18) and core program prerequisite requirements are recommended for the freshman and sophomore years.

##### Accountancy Foundation Courses

PHIL 1000	General Introduction to Philosophy (fulfills humanistic studies requirement)	3
or PHIL 1100	Introduction to Ethics	
or PHIL 1200	Logic and Reasoning	
COMMUN 1200	Public Speaking	3
	3 hours of Psychology or 3 hours of Sociology	3

International Component (See your academic advisor about completion of this requirement.)

##### Pre-Accountancy Courses

ACCTCY 2036	Accounting I *	3
or ACCTCY 2136H	Honors Accounting I	

ACCTCY 2037	Accounting II *	3
or ACCTCY 2137H	Honors Accounting II	
ECONOM 1014	Principles of Microeconomics	3
or ECONOM 1024	Fundamentals of Microeconomics	
ECONOM 1015	Principles of Macroeconomics	3
ENGLSH 1000	Exposition and Argumentation	3
MANGMT 1010	Contemporary Business Practices	1
MATH 1100	College Algebra	3
MATH 1300	Finite Mathematics	3
MATH 1400	Calculus for Social and Life Sciences I	3
STAT 2500	Introduction to Probability and Statistics I	3

##### Required Core Courses

ACCTCY 2258	Computer-Based Data Systems	3
ECONOM 3229	Money, Banking and Financial Markets	3
ECONOM 3251	Theory of the Firm	3
or ECONOM 4351	Intermediate Microeconomics	
FINANC 3000	Corporate Finance	3
MANGMT 3000	Principles of Management	3
MANGMT 3200	Business and Society	3
MANGMT 3540	Introduction to Business Law	3
MRKTNG 3000	Principles of Marketing	3
STAT 3500	Introduction to Probability and Statistics II	3

##### Required Accountancy Courses

ACCTCY 3326	Financial Accounting Theory and Practice I	3
ACCTCY 3328	Accounting Information Systems	3
ACCTCY 3346	Financial Accounting Theory and Practice II	3
ACCTCY 3347	Cost and Managerial Accounting	3
ACCTCY 4353	Introduction to Taxation	3
ACCTCY 4384	Auditing Theory and Practice I	3
	Accountancy Elective	3

##### Professional Electives

Nine credits must be taken as 2000-level or higher University non-business electives or 3000-level business electives

##### Senior Capstone

MANGMT 4970	Strategic Management	3
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##### Graduate Level Coursework

	Total Credits	127
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\* Both ACCTCY 2036 and ACCTCY 2037 must be taken in residence or both must be taken at another campus.

### School of Accountancy Graduation Requirements

Course requirements ensure that at least 40 percent of a student's course work is earned in divisions other than business. The merged BSAcc and MAcc degrees require 150 total credits.

General Education *	23
Pre-Accountancy Courses	28
Accountancy Foundation Courses	9



Required Core Courses	27
Required Accountancy Courses	21
Professional Electives	9
Senior Capstone	3
Graduate Level Coursework	30
<b>Total Minimum</b>	<b>150</b>

\* Additional 3 hours of humanities fulfilled in Accountancy foundation courses. Students also need to fulfill an International Studies Component (3 hours) to be selected with your advisor. These classes can be taken at the undergraduate or graduate level.

## Semester Plan - Bachelor of Science in Accountancy and Master of Accountancy

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1300, 1320, or 1400 *	3	MATH 1300, 1320, or 1400 *	3
State Requirement	3	ENGLSH 1000 (grade of C- or better)	3
PSYCH 1000 or SOCIOL 1000	3	ECONOM 1014	3
PHIL 1000, 1100, or 1200	3	Physical/Biological Science	3
Non-Business Elective	2	Humanities Elective	3
MANGMT 1010	1		
	15		15
Second Year			
Fall	Credits	Spring	Credits
STAT 2500	3	STAT 3500	3
ACCTCY 2036 or 2136H	3	ACCTCY 2037 or 2137H	3
ECONOM 1015	3	ACCTCY 2258	3
Physical/Biological Science	3	Non-Business Elective	3
COMMUN 1200	3	Physical/Biological Science	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
Professional Elective	3	FINANC 3000	3
ACCTCY 3326 (FS only)	3	ACCTCY 3346 (SP only)	3
ACCTCY 3328	3	MRKTNG 3000	3
MANGMT 3000	3	ACCTCY 4353	3
ECONOM 3229	3	MANGMT 3200 (Writing Intensive)**	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
Professional Elective	3	Non Internship (for Internship plan-see below)#	
ECONOM 3251 or 4351	3	MANGMT 4970	3
MANGMT 3540	3	Non Business Elective	3
ACCTCY 3347	3	ACCTCY 4384	3

Humanities Elective	3	ACCTCY/BUS Elective	3
		Professional Elective	3
	15		15
Fifth Year			
Fall	Credits	Spring	Credits
ACCTCY 7365	3	ACCTCY 8450	3
Accountancy Elective	3	MANGMT 7010	3
Accountancy Elective	3	Accountancy Elective	3
Accountancy/Business Elective	3	Accountancy Elective	3
Accountancy/Business Elective	3	Accountancy/Business Elective	3
	15		15
Total Credits: 150			

### # Internship

ACCTCY 4940	Professional Accounting Internship	3
ACCTCY 4384	Auditing Theory and Practice I	3
ACCTCY 7365	Governmental Accounting and Budgeting	3
Independent Study		3
<b>Total Credits</b>		<b>12</b>

# Some students get an opportunity to do a spring internship for 3 hours during the 8th semester. Internships are normally the 1st 8 weeks and students take 6 hours during 2nd 8 weeks for a total of 9 hours. If students do a winter internship, they can normally complete only 12 hours by taking an independent study course. Students would need to complete the additional 6-9 hours prior to or during the summer following the internship.

\* Both MATH 1300 and MATH 1320 must be taken. A grade of C- is required in MATH 1100 (counts in place of non-business elective), MATH 1300 or MATH 1320 and STAT 2500.

\*\* Need grade of C- or better to fulfill requirement.

### Note:

MANGMT 3200 is a required course.

ECONOM 1051H satisfies both ECONOM 1014 or ECONOM 1024 and ECONOM 1015 requirement.

One humanity or science must be 2000-level or above.

Professional electives can be non-business electives (2000+ courses) or Business electives (3000+ courses) approved by academic advisor.

Electives must be approved by advisor so that international studies component is met.

## Graduate

## M.Acc in Accountancy

### Admission Contact Information

Phyllis Moore moorepa@missouri.edu  
303 Cornell Hall; Columbia, MO 65211  
573-882-4463

**The School of Accountancy is NOT accepting any applications for admission to the M.Acc-only program, as we are at full capacity.**

## About the MAcc Program

The growing scope and diversity of functions being performed by professional accountants has created a strong demand for individuals who have both a broader base of general and business education as well as more in-depth technical accounting education than can be obtained in a four-year.

## Requirements for Master's Degree Only

A student who has a degree in a different curricular area or a bachelor's degree in accountancy from another college or university may earn a master's degree from the School of Accountancy upon completion of the requirements for the degree. The student's program must include a minimum of 30 credits beyond the bachelor's degree (or its equivalent) selected from courses carrying graduate credit. In addition, the student must meet the following stipulations:

- At least 15 of the 30 credits must be completed in 8000-9000-level courses.
- A minimum of 24 credits of advanced study must be completed under MU faculty.
- A maximum of 6 graduate credits may be transferred from another college or university.
- All requirements must be completed within eight years from the time of initial enrollment.

MU's M Acc program is designed especially to provide the additional breadth and depth of knowledge and skills required for success in contemporary accounting practice.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Admission Criteria to the MAcc

- Fall deadline: March 15
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GMAT scores:

Minimum	Verbal	Quantitative	Analytical	TOTAL
Minimum Score				640
Minimum Percentile	50 <sup>th</sup>			75 <sup>th</sup>

- Minimum GPA: at least 3.5 for last 60 hours
- Bachelor's degree from an accredited college or university, with a major in accountancy or equivalent
- A prior record of outstanding academic performance
- Strong letters of recommendation

Note: Meeting the minimum requirements does not guarantee admission. Admission is competitive and based on space availability.

## Required Application Materials

[To the Graduate School](#)

All required Graduate School documents

Statement of objectives, no more than 500 words (upload to the online Graduate Application)

TOEFL score (if native language is not English)

[To the M Acc Program](#)

GMAT score

2 Recommendation letters, mailed

## Prerequisites for the MAcc

The master of accountancy (M Acc) program encompasses the last 30 hours of MU's 150-hour accountancy program and presumes students have completed the undergraduate portion of the program, or the equivalent. Students whose undergraduate education is not equivalent to the first 120 hours of the 150-hour program may overcome important deficiencies by taking additional courses approved by the program director.

To be considered for acceptance in the M Acc program candidates must have completed the first 120 hours of MU's 150-hour program or received a baccalaureate degree from an accredited college or university with a major in accountancy or the equivalent (students with bachelor's degrees in non-accounting areas may enter the M Acc program after completing an appropriate set of "prerequisite" courses).

In addition to the requirements listed above, other factors such as the student's statement of objectives and recommendation letters also may be considered to the extent that they provide indications of a student's ability to be successful in the M Acc program.

## The MAcc Admission Process

Generally, admission decisions for the M Acc program are made in the late spring and summer for fall admissions only, **and this is on a highly competitive basis.**

## Graduation Requirements for the MAcc

The basic 30-hour M Acc curriculum requires a minimum of 15 hours of accountancy courses and a minimum of 15 hours of courses reserved exclusively for graduate students. A maximum of 6 semester hours of graduate level course work may be transferred from another accredited master's program.

Through careful selection of electives, the M Acc program provides great flexibility to enable customized programs of study in specialty areas of particular interest to students. One of the most popular areas of specialization is taxation (where a "tax track" is available. Other specialties may be developed in the areas of financial accounting and auditing. Go the following link for more information about graduate accounting certificates: [/undergraduategraduate/collegeofbusiness/additionalminorsandcertificates/](#) (p. 342).

## PhD in Accountancy

### Admission Contact Information

Karen Staggs (staggs@missouri.edu)

303 Cornell Hall

Columbia, MO 65211

573-882-4463

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Admission Criteria

Fall deadline: February 1

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GMAT scores:

Minimum	Verbal	Quantitative	Analytical	TOTAL
Minimum Score				700

- A prior record of outstanding academic performance
- Strong letters of recommendation

## Required Application Materials

### To the Graduate School

All required Graduate School documents

### To the Accountancy PhD Program

- Departmental Application
- 3 Recommendation letters, mailed or accepted electronically through the Graduate School application
- Statement of Purpose, mailed
- Resume, mailed
- Official GMAT scores

## Prerequisites for the Doctoral Degree in Accountancy

International students should note that we rarely admit a student directly from outside the United States unless they have studied/worked in an English-language setting.

Prerequisites to undertaking doctoral course work include one, and preferably two, semesters of calculus; an introductory statistics course; intermediate-level microeconomic theory; and an undergraduate accounting major (or equivalent). Prior graduate work is not required for admission to the program, but most successful applicants do have a master's degree.

## Graduation Requirements for the Doctoral Degree in Accountancy

The University requires 72 total hours beyond a baccalaureate degree for a PhD. In order to meet this requirement, the School of Accountancy requires the following program of course work and dissertation research:

Doctoral-level Accounting Research courses	15
Course Work in supporting theoretical fields (e.g. economics, finance, organizational theory and behavior)	15
Statistics and other research methods courses	18
Weekly Research Seminar (meeting one hour per semester for four years)	8

Dissertation Research	12-16
Total Credits	68-72

Course work is designed to be completed in five semesters (two and one-half years). Written and oral comprehensive examinations are then taken after completion of course work, and the remainder of years three and four is devoted to the completion of the research dissertation. Specializations are available in areas of faculty research interests.

## More Information about the Doctoral Degree in Accountancy

For information about the doctoral degree in accountancy, visit our website or write to:

Dr. Jere Francis, Director of the doctoral program in Accountancy  
 School of Accountancy  
 Robert J. Trulaske, Sr. College of Business  
 303 Cornell Hall  
 University of Missouri  
 Columbia, MO 65211

## Business Administration

Dan W. French, Chair, Finance Department  
403 Cornell Hall  
(573) 882-4055

Doug D. Moesel, Chair, Management Department  
403 Cornell Hall  
(573) 882-6556

Murali Mantrala, Chair, Marketing Department  
403 Cornell Hall  
(573) 882-3282

### Advising Contact

Undergraduate Advising Office  
111 Cornell Hall  
(573) 882-7073  
businessadvising@missouri.edu

### Scholarship Information

111 Cornell Hall  
(573) 882-7073

## Department of Finance

Through the study of finance, students learn to independently analyze security markets, understand the basic valuation techniques and use their knowledge to make investment decisions. In addition, students learn basic theoretical concepts in corporate finance and their application to corporate financing and investment decisions. Course work focuses on the areas of investments, portfolio management, real estate appraisal, financial institutions and corporate finance.

## Department of Management

Management is defined by the Academy of Management as including "all processes, structures, and behaviors that are related to the work of organizations, as well as the dynamics of industries, economies, cultures, and other environmental forces that affect organizations and their employees." Management course work at MU is quite diverse, covering the areas of human resource management, human behavior in organizations, organization theory, strategic management, entrepreneurship, information systems, e-commerce, operations management and business law.

## Department of Marketing

Marketing focuses on creating and managing customers. It deals with the strategies, tactics and business processes involved in researching markets, deciding which markets and segments to pursue, identifying what unique value to provide, and then assembling the products, services, people and partner firms needed to build, communicate and deliver that value.

## Exploratory Course

Students wanting to explore business administration as a major should take MANGMT 1010.

## Double Emphasis

Students may have a dual emphasis of Finance and Real Estate, or may add on an economics emphasis to any other BSBA emphasis program.

## Preprofessional Information

To apply to the upper-level BSBA and a related emphasis area program, a student must have completed a minimum of 45 credits and met the Professional Development Program requirements. A TCOB student must be admitted by the semester after the 60th credit hour is earned. The following courses must be among the credits completed or in process at the time of application:

ACCTCY 2036	Accounting I *	3
or ACCTCY 2136H	Honors Accounting I	
ACCTCY 2037	Accounting II ^	3
or ACCTCY 2137H	Honors Accounting II	
ECONOM 1014	Principles of Microeconomics ^	3
or ECONOM 1024	Fundamentals of Microeconomics	
ECONOM 1015	Principles of Macroeconomics ^	3
ENGLSH 1000	Exposition and Argumentation	3
MANGMT 1010	Contemporary Business Practices	1
MATH 1100	College Algebra	3
MATH 1300	Finite Mathematics #	3
MATH 1400	Calculus for Social and Life Sciences I #	3
STAT 2500	Introduction to Probability and Statistics I	3

\* Both ACCTCY 2036 and ACCTCY 2037 must be taken in residence or goth must be taken at another campus.

^ ECONOM 1051H may be taken in place of ECONOM 1014/ECONOM 1024 and ECONOM 1015.

# Needs grade of C- or better in MATH 1300 or MATH 1400.

## Faculty

### Finance

**Professor** S. Ferris\*\*, D. French\*\*, J. Howe\*\*

**Associate Professor** X. Yan\*\*

**Assistant Professor** W. Allen, Q. Hao\*, J. Lim\*, M. O'Doherty\*, S. Sandy\*

**Associate Teaching Professor** J. Stansfield\*

**Assistant Teaching Professor** M. Carter

### Management

**Professor** T. Dougherty\*\*, L. Franz\*, J. Gabel, A. G. Jago\*, R. Johnson#, A. Stam\*, D. Turban\*, J. Wall\*\*

**Associate Professor** T. Chiles\*\*, C. Franz\*, D. Greening\*, D. Moesel\*\*, C. Robert#, K. Schnatterly\*

**Assistant Professor** L. Jiang\*, D. Yin

**Associate Teaching Professor** G. Bier\*, S. Crews\*, B. S. Downey\*, M. B. Marrs\*, G. D. Martin\*, J. Swenson\*, T. Waid\*

**Assistant Teaching Professor** G. Albright, D. Smith

### Marketing

**Professor** P. Bloch\*\*, S. Gopalakrishna\*\*, M. Mantrala\*\*, S. Ratneshwar\*\*, M. Richins\*\*, L. Scheer\*\*, B. Walker\*, S. Zou\*\*

**Associate Professor D. Marinova\*\***

**Associate Teaching Professor J. Bennett\*, J. Poor\***

**Assistant Teaching Professor C. W. Keene**

## Business Administration Faculty

J. Gabel

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 326)
- BSBA in Business Administration (p. 326)
  - with emphasis in Economics (p. 327)
  - with emphasis in Finance and Banking (p. 328)
  - with emphasis in International Business (p. 330)
  - with emphasis in Management (p. 331)
  - with emphasis in Marketing (p. 333)
  - with emphasis in Real Estate (p. 335)
- Minor in Business (p. 336)

## Admission to the Business Administration Program

### Capacity Limitations

Admission into the upper-level Bachelor of Science in Business Administration (BSBA), or International Business (BSBA) degree program is highly competitive, because enrollment is limited. Each of the individual emphasis areas (Economics, Finance and Banking, Management, Marketing or Real Estate) has its own capacity limitation. Students who have earned a 3.25 minimum UM cumulative GPA or higher will be guaranteed admission to the upper level emphasis area of their choice. Other students with at least a 2.6 minimum UM cumulative GPA will be admitted on a space available basis.

### Preprofessional Information

To apply to the upper-level BSBA and a related emphasis area program, a student must have completed a minimum of 45 credits and met the Professional Development Program requirements. A TCOB student must be admitted by the semester after the 60th credit hour is earned. The following courses must be among the credits completed or in process at the time of application.

ACCTCY 2036	Accounting I *	3
or ACCTCY 2136H	Honors Accounting I	
ACCTCY 2037	Accounting II ^	3
or ACCTCY 2137H	Honors Accounting II	
ECONOM 1014	Principles of Microeconomics ^	3
or ECONOM 1024	Fundamentals of Microeconomics	

ECONOM 1015	Principles of Macroeconomics ^	3
ENGLSH 1000	Exposition and Argumentation	3
MANGMT 1010	Contemporary Business Practices	1
MATH 1100	College Algebra	3
MATH 1300	Finite Mathematics #	3
MATH 1400	Calculus for Social and Life Sciences I #	3
STAT 2500	Introduction to Probability and Statistics I	3

\* Both ACCTCY 2036 and ACCTCY 2037 must be taken in residence or both must be taken at another campus.

^ ECONOM 1051H may be taken in place of ECONOM 1014/ECONOM 1024 and ECONOM 1015.

# Needs grade of C- or better in MATH 1300 or MATH 1400

## Admission to BSBA Degree and Emphasis Areas

In addition to meeting the previous requirements, students are admitted to an upper-level BSBA emphasis area based on UM cumulative grade point average. Students with exceptional circumstances may ask to be considered for admission based on both grades and other factors.

Students request an emphasis area when applying to the upper-division BSBA degree program. If the requested emphasis area is at capacity, students who qualify for admission to the upper-division BSBA degree program are given the opportunity to choose another emphasis area. Students are notified by email when they are eligible to apply for upper-level status. Students are admitted to upper level in February and September of each year.

Students who complete 60 credits without gaining admission to an upper-level BSBA emphasis area will not be eligible to re-enroll in the Trulaske College of Business, unless special accommodations have been made in the Undergraduate Advising Office.

A student may take no more than six credit hours of 3000 or higher business courses through Mizzou Online or non-MU courses off campus, excluding BUS\_AD 4500. Study abroad courses are excluded from this requirement.

## Graduate

Robert J. Trulaske, Sr. College of Business  
 213 Cornell Hall  
 573-882-2750  
<http://business.missouri.edu>

**Crosby MBA Director of Graduate Studies:** Joe Stephens  
**execMBA Director of Graduate Studies:** Zack Odem  
**PhD Program:** Associate Dean Stephen Ferris

- MBA in Business Administration (p. 336)
  - Crosby MBA (daytime program) (p. 336)
  - execMBA (blend of online and in person) (p. 338)
- PhD in Business Administration (p. 339)

### About the Crosby MBA (daytime program)

Crosby MBA (p. 336) candidates come from all backgrounds, including science, engineering, liberal arts, journalism, business and health-related fields. There are no prerequisite courses. Our admission standards

are high and the curriculum is rigorous. The Crosby MBA program is AACSB accredited, nationally recognized and highly ranked by U.S. News America's Best Graduate Schools, Forbes, Princeton Review, and The Wall Street Journal. Students attend full-time, although part-time is an option if the student is able to attend daytime classes.

Factors considered in the admissions decision include undergraduate grade point average (GPA), as indicated on the graduation transcript, with consideration given to other calculations; performance on the Graduate Management Admissions Test (GMAT) or the GRE; work experience, including significant part-time employment and internships; demonstrated leadership; and personal essays. A baccalaureate degree in any discipline from an accredited school is required. Interviews by invitation will also be conducted. See the Crosby MBA website to apply. More>> (p. 336)

## About the execMBA Program (for working professionals)

This innovative executive MBA (p. 338) is specifically designed for high achieving professionals seeking a first-rate MBA program that provides flexibility around their work schedules. This is the same renowned degree and the same renowned faculty offered with the Crosby MBA, but is specially designed for executives. Combining face-to-face class time with online delivery for professionals with substantive experience, the 21-month execMBA program will connect you with peers, challenge you in relevant ways, and develop the mind- and skill-set to match today's marketplace.

All applicants to the MU execMBA must have a minimum of 5-7 years of professional work experience, as well as a letter of endorsement from their employer to participate in the program. Other factors considered in admission include undergraduate GPA (a bachelor's degree in any discipline from an accredited school is required), demonstrated leadership experience and a personal statement addressing criteria outlined on the exec MBA website. Interviews by invitation will also be conducted. More>> (p. 338)

## About the PhD Program

The PhD program (p. 339) is designed to prepare graduates for careers as effective university researchers and teachers or for senior research positions in business or government. Course work involves research activities such as literature review and critique, theoretical modeling, research design, computer-assisted empirical analysis and preparation of proposals and research papers. PhD candidates are provided the opportunity to teach undergraduate courses in their specialty area. In addition, students are expected to participate in national and regional academic conferences and are encouraged to work with faculty in developing individual research and teaching skills. More>> (p. 339)

## Program Location: Cornell Hall

Cornell Hall, a state-of-the-art building, houses the Robert J. Trulaske, Sr. College of Business. It contains labs with over 230 computers with a variety of up-to-date software. The College subscribes to the following online services, databases and software packages: Wharton Research Data Services, Audit Analytics Compustat, CRSP, Datastream/Worldscope, Eventus, I/B/E/S, IRRC, ISSM, Mergent FISD, Mutual Fund Links, SDC Platinum, Thomson Reuters, Stock Trak, and Qualtrics (an online survey system).

## Undergraduate

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### Department Level Requirements - Business Administration

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#### Professional Development Program

In addition to completing required coursework to earn a Bachelor of Science, Business Administration degree, students must fulfill the requirements of the Professional Development Program (PDP). The goal of the PDP is to offer opportunities to all BS BA and Accounting students to develop core competencies and values necessary for success in their professional careers.

As a graduation requirement, the program is comprised of the following:

- Completion of designated professional activities to acquire points for admission to the upper division. Once admitted to the upper division, students will continue to earn points to meet the graduation requirements. Specific activities may be required.
- Completion of BUS\_AD 3500 the semester immediately following admission to the upper division. This course is a pre-requisite to the completion of the required BUS\_AD 4500. These two courses cannot be completed concurrently without prior approval. BUS\_AD 3500 must be completed in residence.
- Completion of BUS\_AD 4500 once admitted to the upper division. This will include completion of a professional level internship/practicum experience. Practicums can be completed over a summer or semester-long period of time (intercession assignments will not meet the PDP requirement). Students must seek final approval of their internship/practicum experience from the PDP Director before beginning the assignment. BUS\_AD 4500 must be completed in residence.

If a student fails to meet the requirements of the PDP at either the lower or upper division, the student will not be allowed to continue in or graduate from the Trulaske College of Business.

#### Professional Development Graduation Requirement

- The student must earn a minimum of 70 PDP points (maximum of 100) at the lower division for official admittance to the upper division. Once admitted, students must earn a total of 200 PDP points to meet the requirement.
- The student must earn a C- (or higher) in BUS\_AD 3500 to satisfy the requirement.
- BUS\_AD 4500 is graded as Satisfactory/Unsatisfactory. Students must complete practicum course to a satisfactory level of 70% or greater to receive a passing grade for the course.

## BSBA in Business Administration

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### Major Program Requirements

Students in the Trulaske College of Business are in either the lower level (undeclared) or the upper level (admitted to an emphasis area). Students entering the Trulaske College of Business usually enter the lower level while they take University general education and business preparation courses. The first two years of all business programs (except international

business and accounting) involve the same course sequences. A student typically applies to the upper level at the end of the sophomore year or the beginning of the junior year.

A student may count a maximum of 30 credits in their emphasis area to meet the 120-credit requirement for the undergraduate degree.

Requirements above and beyond general education requirements are listed under upper level admission courses.

Students must complete all university requirements, including general education (p. 18), and the Department Level Requirements (p. 326), in addition to the degree requirements below.

## Major Core Requirements

Course requirements ensure that 40 percent of a student's course work is earned in divisions other than business.

Students must also complete all University requirements (p. 17) as well as University General education requirements (p. 18).

General Education (see University General Education Requirements)	32
Upper Level Admission Courses	28
Required Core Courses	27
Emphasis Support Courses	30
Required Emphasis Courses *	
Additional Emphasis Courses *	
Emphasis Support Courses *	
Senior Capstone	3
<b>Total minimum</b>	<b>120</b>

## Upper Level Admission Courses

ACCTCY 2036	Accounting I *	3
or ACCTCY 2136H	Honors Accounting I	
ACCTCY 2037	Accounting II *	3
or ACCTCY 2137H	Honors Accounting II	
ECONOM 1014	Principles of Microeconomics	3
or ECONOM 1024	Fundamentals of Microeconomics	
ECONOM 1015	Principles of Macroeconomics *	3
ENGLISH 1000	Exposition and Argumentation *	3
MANGMT 1010	Contemporary Business Practices *	1
MATH 1100	College Algebra *	3
MATH 1300	Finite Mathematics *	3
MATH 1400	Calculus for Social and Life Sciences I *	3
STAT 2500	Introduction to Probability and Statistics I *	3
<b>Total Credits</b>		<b>28</b>

\* Both ACCTCY 2036 and ACCTCY 2037 must be taken in residence or both must be taken at another campus.

## Emphasis Areas

General Education Requirement	32
Upper Level Admissions Courses	28
Required Courses	27

## Semester Plan

Refer to the Semester Plans for the emphasis areas.

# BSBA in Business Administration with Emphasis in Economics

## Major Program Requirements

The sequence of courses for the BSBA with an emphasis in economics introduces the student to the tools of economic analysis and to their use in decision-making. It also may provide training in internal and external forecasting. Such analytical techniques are appropriate for industrial, commercial and financial organizations as well as government agencies.

Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 326), in addition to the degree requirements below.

### Required Core Courses

ACCTCY 2258	Computer-Based Data Systems	3
or CMP_SC 1040	Introduction to Problem Solving and Programming	
or CMP_SC 1050	Algorithm Design and Programming I	
ECONOM 3229	Money, Banking and Financial Markets	3
FINANC 3000	Corporate Finance	3
MANGMT 3000	Principles of Management	3
MANGMT 3540	Introduction to Business Law	3
MRKTNG 3000	Principles of Marketing	3
STAT 3500	Introduction to Probability and Statistics II	3
BUS_AD 3500	Professional Development in Business	3
BUS_AD 4500	Professional Development Program - Practicum	3

### Required Economics Courses

ECONOM 4351	Intermediate Microeconomics	3
ECONOM 4353	Intermediate Macroeconomics	3

### Additional Economic Courses

Courses selected from the following: 9-12

ECONOM 3224	Introduction to International Economics
ECONOM 4311	Labor Economics
ECONOM 4315	Public Economics
ECONOM 4320	History of Economic Thought
ECONOM 4322	Economics of Regulation and Antitrust
ECONOM 4325	The International Monetary System
ECONOM 4326	Economics of International Trade

ECONOM 4329	The Banking System and the Money Market
ECONOM 4340	Introduction to Game Theory
ECONOM 4345	Economics of Education
ECONOM 4355	Industrial Organization and Competitive Strategy
ECONOM 4360	Economic Development
ECONOM 4361	Comparative Economic Systems
ECONOM 4370	Quantitative Economics
ECONOM 4371	Introductory Econometrics
ECONOM 4384	Structural Change in Economic History
ECONOM 4970	Senior Seminar in Economics
ECONOM 4995	Honors Proseminar

#### Emphasis Support Courses \*

Courses to be selected from: 12-15

Accountancy	Any 3000 or 4000 level class
COMMUN 1200	Public Speaking
Economics	Any 4000 level class not used as an Economics elective
ENGLSH 2030	Professional Writing
Finance	Any 3000 or 4000 level class
Management	Any 3000 or 4000 level class
Marketing	Any 3000 or 4000 level class
Psychology	Any 3000 or 4000 level class
Sociology	Any 3000 or 4000 level class
Statistics	Any 3000 or 4000 level class

**Capstone Course - Senior year (on campus) Minimum grade of C- required** 3

MANGMT 4970 Strategic Management 3

**Total** 120

\* 12 credits Emphasis Support Courses required if 12 credits in economics are taken (from required economics courses section); 15 are taken (from required economics courses section); 15 credit required if 9 credits in economics are taken.

A student may count a maximum of 30 credits in economics to meet the 120-credit requirement for the undergraduate degree.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices and where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	MATH 1400	3
State requirement	3	ECONOM 1014	3
Humanities	3	Humanities	3
Biological Science	3	Elective	3
Elective	3	ENGLSH 1000	3
MANGMT 1010	1		
	<b>16</b>		<b>15</b>
Second Year			
Fall	Credits	Spring	Credits
MATH 1300	3	STAT 2500	3
ECONOM 1015	3	ECONOM 3229	3
ACCTCY 2036	3	ACCTCY 2037	3
Humanities 2000 level (writing intensive)	3	Biological or Physical Science with Lab	3
Physical Science	3	Elective	3
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
MRKTNG 3000	3	ECONOM 4351	3
STAT 3500	3	MANGMT 3540	3
MANGMT 3000	3	Emphasis Support course	3
ACCTCY 2258	3	FINANC 3000	3
BUS_AD 3500	3	MANGMT 3200 (writing intensive)	3
	<b>15</b>		<b>15</b>
Fourth Year			
Fall	Credits	Spring	Credits
ECONOM 4353	3	MANGMT 4970	3
Additional Economics course	3	Additional Economics course	3
Additional Economics course	3	Emphasis Support course	3
Emphasis Support course	3	Emphasis Support course	3
BUS_AD 4500	3	Elective	2
	<b>15</b>		<b>14</b>
Total Credits: 120			

# BSBA in Business Administration with Emphasis in Finance and Banking

## Major Program Requirements

The BSBA provides an emphasis area in finance and banking for the student anticipating a career in the financial section of a corporation, in a bank or other financial institution, in an investment management firm or in the financial division of a government or non-profit organization.

Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 326), in addition to the degree requirements below



**General Education Requirements** 32

**Upper Level Admission Courses** 28

**Required Core Courses**

ACCTCY 2258	Computer-Based Data Systems	3
or CMP_SC 1040	Introduction to Problem Solving and Programming	
or CMP_SC 1050	Algorithm Design and Programming I	
ECONOM 3229	Money, Banking and Financial Markets	3
FINANC 3000	Corporate Finance	3
MANGMT 3000	Principles of Management	3
MANGMT 3540	Introduction to Business Law	3
MRKTNG 3000	Principles of Marketing	3
STAT 3500	Introduction to Probability and Statistics II	3
BUS_AD 3500	Professional Development in Business	3
BUS_AD 4500	Professional Development Program - Practicum	3

**Required Finance & Banking Courses**

FINANC 4010	Financial Management	3
FINANC 4020	Investments	3
ECONOM 3251	Theory of the Firm	3
or ECONOM 4351	Intermediate Microeconomics	
ACCTCY 4356	Financial Accounting Concepts	3
MANGMT 4010	Operations Management	3

**Additional Finance & Banking Courses** 9

Select 3 of the following

FINANC 4030	Financial Intermediaries and Markets
FINANC 4110	Financial Management Policy
FINANC 4120	Security Analysis
FINANC 4130	Management of Financial Institutions
FINANC 4185	Problems in Finance
FINANC 4201	Topics in Finance (with academic advisor consent)
FINANC 4220	Portfolio Management
FINANC 4320	Financial Futures and Options
FINANC 3300	Personal Risk Management and Insurance
FINANC 4500	Principles of Real Estate
FINANC 4510	Real Estate Appraisal
FINANC 4520	Real Estate Finance and Investment
FINANC 4530	Real Estate Portfolio Analysis and REITs
FINANC 4620	Investment Strategy of Warren Buffett
FINANC 4820	Investment Fund Management
FINANC 4720	International Finance
FINANC 4940	Professional Finance Internship

**Emphasis Support Courses**

Select two of the following: 6

ACCTCY 2258	Computer-Based Data Systems (if not used in required core courses)
Accountancy: Any 3000 or 4000 level class	
COMMUN 1200	Public Speaking
CMP_SC 1050	Algorithm Design and Programming I (if not used in required core courses)
CMP_SC 2050	Algorithm Design and Programming II

Economics: Any 4000 level class not used as an Economics elective

ENGLISH 2030 Professional Writing

Finance: Any 3000 or 4000 level class

FINPLN 4189 Financial Planning: Applied Tax Law

Management: Any 3000 or 4000 level class

Marketing: Any 3000 or 4000 level class

**Capstone course - Senior year (on campus) Minimum grade of C- required** 3

MANGMT 4970	Strategic Management
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Total Credits 120

**Semester Plan**

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	ECONOM 1014	3
State Requirement	3	MATH 1400	3
Humanities	3	Humanities	3
Biological Science	3	Elective	3
MANGMT 1010	1	ENGLISH 1000	3
Elective	3		
	16		15
Second Year			
Fall	Credits	Spring	Credits
MATH 1300	3	STAT 2500	3
ECONOM 1015	3	ECONOM 3229	3
ACCTCY 2036	3	ACCTCY 2037	3
Humanities (2000 level) Writing Intensive	3	Biological and Physical Science with Lab	3
Physical Science	3	Elective	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
FINANC 3000	3	MANGMT 3540	3
STAT 3500	3	FINANC 4010	3
MANGMT 3000	3	FINANC 4020	3
ACCTCY 2258	3	MANGMT 3200 (Writing Intensive )	3
BUS_AD 3500	3	MRKTNG 3000	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
MANGMT 4010	3	MANGMT 4970	3
ACCTCY 4356	3	Additional Finance Course	3
Additional Finance Course	3	ECONOM 3251 or 4351	3
Emphasis Support Course	3	Additional Finance Course	3

BUS_AD 4500	3	Elective	2
	15		14
Total Credits: 120			

## BSBA in Business Administration with Emphasis in International Business

### Major Program Requirements

International Business is a joint degree program offered by the College of Arts and Science and the Trulaske College of Business. The program incorporates foreign language, geographic region and cultural environment courses with core and international business courses. Completion of this degree program requires 136-141 credits depending on emphasis.

To complete this course of study, students must be accepted in both the Bachelor of Arts in International Studies program in the College of Arts and Science and the Bachelor of Science in Business Administration program in the Trulaske College of Business. Students must also complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 326), in addition to the degree requirements below.

#### Social Sciences

GEOG 1100	Regions and Nations of the World I	3
or GEOG 1200	Regions and Nations of the World II	
POL_SC 1400	International Relations	3
or POL_SC 2700	Comparative Political Systems	

#### State Requirement

#### Behavior Sciences

ANTHRO 2030	Cultural Anthropology	3
Choose one additional course from Anthropology (except 2050, 2051 or 2052), Psychology, or Sociology		

#### Humanities

Civilization course in language studied		3
Literature course in language studied		3
Select one of the following:		3
AR_H_A 1110	Ancient and Medieval Art	
AR_H_A 1120	Renaissance through Modern Art	
ENGLSH 2155	Introduction to World Literatures	
MUSIC_NM 1313	Introduction to World Music	
PHIL 2100	Philosophy: East and West	
PHIL 2410	Philosophies of War and Peace	
REL_ST 2110	Religions of the World	
GN_HON 2117H	The Emerging Canons of the Americas	

Additional Humanities 3

#### Biological & Physical Sciences

One course must include a lab 6-7

#### Foreign Language

All in the same language 18-19

#### Area Support

To be selected with the A&S advisor. Coursework typically includes classes in Culture, Geography, Government, or History related to language studied.

#### Upper Level Admission Courses

#### Required Business Core Courses

ACCTCY 2258	Computer-Based Data Systems	3
or CMP_SC 1040	Introduction to Problem Solving and Programming	
or CMP_SC 1050	Algorithm Design and Programming I	
ECONOM 3229	Money, Banking and Financial Markets	3
or ECONOM 3251	Theory of the Firm	
FINANC 3000	Corporate Finance	3
MANGMT 3000	Principles of Management	3
MANGMT 3540	Introduction to Business Law	3
MRKTNG 3000	Principles of Marketing	3
STAT 3500	Introduction to Probability and Statistics II	3
BUS_AD 3500	Professional Development in Business	3
BUS_AD 4500	Professional Development Program - Practicum	3

#### Business Area

to be selected with Business advisor, depending on emphasis area.

#### Capstone Course - senior year (on campus) Minimum grade of C- required

MANGMT 4970	Strategic Management	3
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Total Credits 130-132

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	MATH 1300	3
State Requirement	3	ECONOM 1015	3
ECONOM 1014	3	ENGLSH 1000	3
Foreign Language 1	5	Foreign Language 2	5
MANGMT 1010	1	Elective	3
	15		17
Second Year			
Fall	Credits	Spring	Credits
MATH 1320	3	ACCTCY 2037	3
Foreign Language 3	3	STAT 2500	3
Humanities	3	Physical Science	4
ACCTCY 2036	3	Foreign Language 4	3
Behavioral Science	3	MANGMT 3540	3
	15		16
Third Year			
Fall	Credits	Spring	Credits
MRKTNG 3000	3	FINANC 3000	3

GEOG 1100 or 1200	3	POL_SC 1400 or 2700	3
Foreign Language	3	ECONOM 3229 or 3251	3
Foreign Civilization	3	BUS_AD 3500	3
STAT 3500	3	MANGMT 3000	3
	15		15
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
Humanities	3	ACCTCY 2258 or CMP_SC 1050	3
Foreign Language	3	Business Area	3
Biological Science	3	Business Area	3
ANTHRO 2030	3	A&S Area Support	3
BUS_AD 4500	3	A&S Area Support	3
	15		15
<b>Fifth Year</b>			
<b>Fall</b>	<b>Credits</b>		
MANGMT 4970	3		
Business Area	3		
Business Area	3		
Business Area	3		
Business Area	3		
A&S Area Support	3		
	18		
Total Credits: 141			

## BSBA in Business Administration with Emphasis in Management

### Major Program Requirements

Management is the directing and guiding of activities to produce a desired result, product or service. Managers are repeatedly required to make decisions that will have far-reaching effects. The basic functions all managers perform are planning, organizing, staffing, motivating and directing. Professional education in management can lead to a variety of career opportunities in the private and public sectors.

Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 326), in addition to the degree requirements below.

<b>General Education Requirements</b>	32
<b>Upper Level Admission Courses</b>	28
<b>Required Core Courses</b>	
ACCTCY 2258 Computer-Based Data Systems or CMP_SC 1040 Introduction to Problem Solving and Programming or CMP_SC 1050 Algorithm Design and Programming I	3
ECONOM 3229 Money, Banking and Financial Markets or ECONOM Theory of the Firm 3251	3
FINANC 3000 Corporate Finance	3
MANGMT 3000 Principles of Management	3
MANGMT 3540 Introduction to Business Law	3
MRKTNG 3000 Principles of Marketing	3

STAT 3500	Introduction to Probability and Statistics II	3
BUS_AD 3500	Professional Development in Business	3
BUS_AD 4500	Professional Development Program - Practicum	3

#### Required Management Courses

MANGMT 4010	Operations Management	3
MANGMT 4020	Human Resource Management	3
MANGMT 4030	Organizational Behavior	3

#### Additional Management Courses

Select three of the following: 9

MANGMT 3300	Introduction to Business Processes and Technologies	
MANGMT 3901	Special Topics in Management	
MANGMT 3975	Current Issues in International Management	
MANGMT 4050	Management of Service Operations	
MANGMT 4060	Project Management Fundamentals	
MANGMT 4110	Total Quality Management	
MANGMT 4120	Human Resource Management Law	
MANGMT 4130	Advanced Organizational Behavior	
MANGMT 4140	Business Communication	
MANGMT 4201	Topics in Management	
MANGMT 4210	Management Science	
MANGMT 4220	Compensation Theory and Practice	
MANGMT 4310	Modern Manufacturing	
MANGMT 4320	Selected Problems in Human Resource Management	
MANGMT 4330	Organizational Theory	
MANGMT 4340	Crisis Management	
MANGMT 4350	Leadership Development	
MANGMT 4420	Collective Bargaining	
MANGMT 4450	Management of Electronic Commerce	
MANGMT 4460	Electronic Commerce Security	
MANGMT 4480	Business Data Communication and Networking	
MANGMT 4520	Change Management in Business	

MANGMT 4540	Legal Aspects of Business Organization and Operation
MANGMT 4560	The Law of Commercial Credit Transactions
MANGMT 4620	Web Development Fundamentals
MANGMT 4700	Principles of Entrepreneurship
MANGMT 4710	The Entrepreneurial Process
MANGMT 4730	New Business Planning and Management
MANGMT 4750	Entrepreneurial Innovation Management: Enterprise Conception
MANGMT 4760	Entrepreneurial Innovation Management: Enterprise Design
MANGMT 4770	Entrepreneurial Innovation Management: Enterprise Operation
MANGMT 4940	Professional Management Internship
<b>Emphasis Support Courses</b> 12	
Courses approved by the student's management advisor selected from:	
ACCTCY 2258	Computer-Based Data Systems
Accountancy	Courses 3000+
ANTHRO 3700	Cultures of Europe
Chinese, French, German, Hebrew, Italian, Japanese, Korean, Portuguese, Romance Lang, Russian, Spanish 2300+	
COMMUN 1200	Public Speaking
COMMUN 3575	Business and Professional Communication
COMMUN 4476	Organizational Communication
CMP_SC 1050	Algorithm Design and Programming I
CMP SC Courses 2000+	
ECONOM Courses 3000+	
ECE Courses 2000+	
ENGLSH 2030 Professional Writing	
Finance Courses 3000+	
GEOG 2710 Economic Geography	
HIST 4420 American Urban History	
IMSE courses 2000+	
INFOTC 2610 Audio/Video I	
INFOTC 2810 Fundamentals of Network Technology	
MANGMT courses 3000+	
MRKTNG Courses 3000+	
PHIL 2400	Ethics and the Professions
PHIL 2420	Ethical Issues in Business
PHIL 4500	Theories of Ethics
POL_SC 2700	Comparative Political Systems

POL_SC 4420	Politics of International Economic Relations
POL_SC 4540	American Foreign Policies
POL_SC 4600	Latin American Politics
POL_SC 4610	European Political Systems
POL_SC 4720	Politics of Development
PSYCH 2310	Social Psychology
PSYCH 3010	Research Methods in Psychology I
PSYCH 3110	Theories of Learning
PSYCH 3130	Decisions, Values and Choice
PSYCH 4340	Attitude Change
PSYCH 4810	Industrial/Organizational Psychology
PSYCH 4830	Psychology of Women
SOCIOL 3310	Social Psychology
SOCIOL 3320	Sociology of Gender
SOCIOL 3400	Politics of the Media
SOCIOL 3520	Collective Behavior
SOCIOL 3700	Organizations and Institutions
SOCIOL 3710	The Sociology of Work
SOCIOL 4310	Advanced Social Psychology
SOCIOL 4315	Social Demography

**Capstone Course - senior year (on campus) Minimum grade of C- required**

MANGMT 4970	Strategic Management	3
Total Credits		120

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	MATH 1400	3
State Requirement	3	ECONOM 1014	3
Humanities	3	Humanities	3
Biological Science	3	Elective	3
Elective	3	ENGLSH 1000	3
MANGMT 1010	1		
	16		15
Second Year			
Fall	Credits	Spring	Credits
MATH 1300	3	STAT 2500	3
ECONOM 1015	3	ECONOM 3229 or 3251	3
ACCTCY 2036	3	ACCTCY 2037	3
Humanities (2000 level) Writing Intensive	3	Biological or Physical Science with Lab	3
Physical Science	3	Elective	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
MRKTNG 3000	3	FINANC 3000	3

STAT 3500	3	MANGMT 3540	3
MANGMT 3000	3	MANGMT 4020	3
ACCTCY 2258	3	Additional Management Course	3
BUS_AD 3500	3	MANGMT 3200 (Writing Intensive)	3
	15		15
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MANGMT 4010	3	MANGMT 4970	3
MANGMT 4030	3	Additional Management Course	3
Additional Management course	3	Emphasis Support Course	3
Emphasis Support	3	Emphasis Support Course	3
BUS_AD 4500	3	Elective	2
	15		14
Total Credits: 120			

## BSBA in Business Administration with Emphasis in Marketing

### Major Program Requirements

Marketing focuses on the activities involved in the creation and sale of goods and services that serve prospective customers' needs and wants. The BSBA with an emphasis in marketing is suitable for students who anticipate careers in areas such as retail management, sales, buying and supply chain management; marketing research; product and brand management; marketing communications; customer relationship management; international marketing; and service marketing.

Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 326), in addition to the degree requirements below.

**General Education Requirements** 32

**Upper Level Admission Courses** 28

**Required Core Courses** 27

ACCTCY 2258	Computer-Based Data Systems
or CMP_SC 1040	Introduction to Problem Solving and Programming
or CMP_SC 1050	Algorithm Design and Programming I
ECONOM 3229	Money, Banking and Financial Markets
or ECONOM 3251	Theory of the Firm
FINANC 3000	Corporate Finance
MANGMT 3000	Principles of Management
MANGMT 3540	Introduction to Business Law
MRKTNG 3000	Principles of Marketing
STAT 3500	Introduction to Probability and Statistics II
BUS_AD 3500	Professional Development in Business
BUS_AD 4500	Professional Development Program - Practicum

**Required Marketing Courses** 6

MRKTNG 4000	Marketing Management
MRKTNG 4050	Marketing Research

**Additional Marketing Courses** 12

Select from the following:

MRKTNG 3901	Special Topics in Marketing *
MRKTNG 3942	International Business Internship *
MRKTNG 3975	Current Issues in International Marketing *
MRKTNG 3985	Problems in International Business *
MRKTNG 4185	Problems in Marketing *
MRKTNG 4201	Topics in Marketing
MRKTNG 4220	Consumer Behavior
MRKTNG 4250	Retail Marketing
MRKTNG 4350	Business-to-Business Relationships
MRKTNG 4380	Buying and Supply Chain Management
MRKTNG 4410	Personal Selling
MRKTNG 4420	Sales Management
MRKTNG 4440	Services Marketing
MRKTNG 4450	Marketing Channels
MRKTNG 4550	Integrated Marketing Communications
MRKTNG 4650	e-Marketing
MRKTNG 4720	Global Marketing
MRKTNG 4750	Marketing, Society, and Government
MRKTNG 4880	Contemporary Issues in Marketing
MRKTNG 4940	Marketing Practicum *

**Emphasis Support Courses** 12

A list of suggested emphasis support courses for marketing majors is available at the College of Business undergraduate advising office.

Pre-approved emphasis support courses include: \*\*

Any 2000+ course in: Astronomy, Biochemistry, Biological Engineering, Biological Science, Chemical Engineering, Chemistry, Civil & Environmental Engineering, Computer Science, Electrical & Computer Engineering, Geography, Industrial & Manufacturing Systems Engineering, Mathematics, Mechanical & Aerospace Engineering, Physics

Any 2300+ course in: Chinese, French, German, Hebrew, Italian, Japanese, Korean, Portuguese, Romance Languages, Russian, Spanish

Any 3000+ course in: Accountancy, Agricultural Economics, Anthropology, Communication, Economics, Food Science, Hospitality Management, Philosophy, Psychology, Rural Sociology, Sociology, Statistics

Any 4000+ course in: Architectural Studies, Atmospheric Sciences, Black Studies, English, Environmental Studies, Finance, Fisheries & Wildlife, Forestry, History, Information Science & Learning Technologies, Interdisciplinary Studies, International Studies, Journalism, Linguistics, Management, Natural Resources, Parks Recreation & Tourism, Political Science, Religious Studies, Soil Science, Textile & Apparel Management, Women's & Gender Studies

Other 3000+ level courses taken in fulfillment of requirements for an official minor or dual major

Any of the specific courses listed below \*\*\*

COMMUN Public Speaking  
1200

ENGLISH 2030 Professional Writing

FRENCH Elementary French III  
2100

FRENCH Intermediate French Composition and  
2160 Conversation

GERMAN Intermediate German I  
2100

HIST 3820 Twentieth Century China

ITAL 2160 Intermediate Composition and Conversation

JAPNSE 2160 Japanese Conversation and Composition

MATH 1360 Geometric Concepts

MATH 1700 Calculus II

MATH 1800 Introduction to Analysis I

MRKTNG Special Topics in Marketing  
3901

MRKTNG International Business Internship  
3942

MRKTNG Current Issues in International Marketing  
3975

MRKTNG Problems in International Business  
3985

MRKTNG Problems in Marketing  
4185

MRKTNG Marketing Practicum  
4940

PHIL 2420 Ethical Issues in Business

PHIL 2600 Rational Decisions

PHIL 2700 Elementary Logic

PORT 2160 Intermediate Portuguese

PSYCH 2320 Introduction to Personality

RUSS 2130 Second-Year Russian I

RUSS 2160 Second-Year Russian II

S\_A\_ST 3130 Advanced Hindi Readings I

S\_A\_ST 3160 Advanced Hindi Readings II in South Asian  
Studies

SPAN 2100 Elementary Spanish III

SPAN 2160 Intermediate Spanish Composition and  
Conversation

**Capstone course - senior year (on campus) 3**

Minimum grade of C- required

MANGMT Strategic Management  
4970

Total Credits 120

\* Only one may be used to fulfill additional marketing course requirement.

\*\* NOTE: Only courses not used to fulfill other Marketing, Trulaske College of Business, or University General Education (p. 18) requirement (except some WI) qualify as emphasis support electives. Check the *Undergraduate Course Catalog* for prerequisites.

\*\*\* Note: A maximum of 6 credits from MRKTNG 3901, MRKTNG 3942, MRKTNG 3975, MRKTNG 3985, MRKTNG 4185, and MRKTNG 4940 can be counted towards emphasis support courses.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	MATH 1400	3
State Requirement	3	ECONOM 1014	3
Humanities	3	Humanities	3
Biological Science	3	Elective	3
Elective	3	ENGLISH 1000	3
MANGMT 1010	1		
	<b>16</b>		<b>15</b>
Second Year			
Fall	Credits	Spring	Credits
MATH 1300	3	STAT 2500	3
ECONOM 1015	3	ECONOM 3229	3
ACCTCY 2036	3	ACCTCY 2037	3
Humanities (2000 Level) Writing Intensive	3	Biological or Physical Science with Lab	3
Physical Science	3	Elective	3
	<b>15</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
MRKTNG 3000	3	FINANC 3000	3
STAT 3500	3	MANGMT 3540	3

MANGMT 3000	3	MRKTNG 4050	3
ACCTCY 2258	3	Additional Marketing Course	3
BUS_AD 3500	3	MANGMT 3200 (Writing Intensive)	3
	15		15
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MRKTNG 4000	3	MANGMT 4970 (Capstone)	3
Additional Marketing Course	3	Additional Marketing Course	3
Additional Marketing Course	3	Emphasis Support Course	3
Emphasis Support	3	Emphasis Support Course	3
BUS_AD 4500	3	Elective	2
	15		14
Total Credits: 120			

## BSBA in Business Administration with Emphasis in Real Estate

### Major Program Requirements

This curriculum, leading to a BSBA with an emphasis in real estate, provides a basic education for students contemplating a career in real estate, real estate management or associated fields.

Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 326), in addition to the degree requirements below.

**General Education Requirements** 32

**Upper Level Admissions Courses** 28

#### Required Core Courses

ACCTCY 2258	Computer-Based Data Systems	3
or CMP_SC 1040	Introduction to Problem Solving and Programming	
or CMP_SC 1050	Algorithm Design and Programming I	
ECONOM 3229	Money, Banking and Financial Markets	3
or ECONOM 3251	Theory of the Firm	
FINANC 3000	Corporate Finance	3
MANGMT 3000	Principles of Management	3
BUS_AD 3500	Professional Development in Business	3
MANGMT 3540	Introduction to Business Law	3
MRKTNG 3000	Principles of Marketing	3
BUS_AD 4500	Professional Development Program - Practicum	3
STAT 3500	Introduction to Probability and Statistics II	3

#### Real Estate Required Courses

FINANC 4010 & FINANC 4020	Financial Management and Investments	6
MANGMT 4010	Operations Management	3
ECONOM 4351 or ECONOM 3251	Intermediate Microeconomics Theory of the Firm	3
ACCTCY 4356	Financial Accounting Concepts	3
FINANC 4500	Principles of Real Estate	3

#### Additional Real Estate Courses

Select two of the following: 6

FINANC 4510 Real Estate Appraisal

FINANC 4520 Real Estate Finance and Investment

FINANC 4530 Real Estate Portfolio Analysis and REITs

#### Emphasis Support Courses

Select two of the following 6

ACCTCY 2258 Computer-Based Data Systems (if not used in required core courses)

Accountancy: Any 3000 or 4000 level class

COMMUN 1200 Public Speaking

CMP\_SC 1050 Algorithm Design and Programming I

CMP\_SC 2050 Algorithm Design and Programming II

Economics: Any 4000 level class not used as an Economics elective

ENGLISH 2030 Professional Writing

FINPLN 4189 Financial Planning: Applied Tax Law

Management: Any 3000 or 4000 level class

Marketing: Any 3000 or 4000 level class

Finance: Any 3000 or 4000 level class

**Capstone course - senior year (on campus)** 3

Minimum grade of C- required

MANGMT 4970 Strategic Management

Total Credits 120

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1100	3	MATH 1400	3
State Requirement	3	ECONOM 1014	3
Humanities	3	Humanities	3
Biological/Physical Science	3	Elective	3
Elective	3	ENGLISH 1000	3
MANGMT 1010	1		
	16		15
Second Year			
Fall	Credits	Spring	Credits
MATH 1300	3	STAT 2500	3
ECONOM 1015	3	ECONOM 3229	3
ACCTCY 2036	3	ACCTCY 2037	3
Humanities (2000 level) Writing Intensive	3	Biological/Physical Science with Lab	3
Biological/Physical Science	3	Elective	3
	15		15

Third Year			
Fall	Credits	Spring	Credits
FINANC 3000	3	MANGMT 3540	3
STAT 3500	3	FINANC 4010	3
MANGMT 3000	3	FINANC 4020	3
ACCTCY 2258	3	MANGMT 3200 (Writing Intensive)	3
BUS_AD 3500	3	MRKTNG 3000	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
MANGMT 4010	3	MANGMT 4970 (Capstone)	3
ACCTCY 4356	3	Additional Real Estate Course	3
Additional Real Estate Course	3	ECONOM 3251 or 4351	3
Emphasis Support Course	3	Additional Real Estate Course	3
BUS_AD 4500	3	Elective	2
	15		14
Total Credits: 120			

## Minor in Business

The business minor has the same rigor and content as the fundamental courses taken by business students. It provides flexibility in undergraduate studies and better prepares students for jobs and for graduate school. The business minor includes courses that are highly complementary. For most students, the requirements for the business minor are far more valuable than a similar number of courses in one or two areas.

15 of the 18 hours must be taken in residence and a 2.0 GPA in all business courses and those required for the business minor is required. See a business advisor for questions regarding the business minor.

ACCTCY 2010	Introduction to Accounting	3
or ACCTCY 2036	Accounting I	
ECONOM 1014	Principles of Microeconomics (3)	3-5
or ECONOM 1051	General Economics	
MANGMT 3000	Principles of Management	3
FINANC 2000	Survey of Business Finance	3
or FINANC 3000	Corporate Finance	
MRKTNG 3000	Principles of Marketing	3
Business Elective (any Trulaske College of Business core above 3000 level)		3
Total Credits		18-20

## Graduate

### MBA in Business Administration

Robert J. Trulaske, Sr. College of Business  
 213 Cornell Hall  
 573-882-2750  
<http://business.missouri.edu>

## About the Crosby MBA (daytime program)

**Crosby MBA Director of Graduate Studies:** Joe Stephens

Crosby MBA candidates come from all backgrounds, including science, engineering, liberal arts, journalism, business and health-related fields. There are no prerequisite courses. Our admission standards are high and the curriculum is rigorous. The Crosby MBA program is AACSB accredited, nationally recognized and highly ranked by U.S. News America's Best Graduate Schools, Forbes, Princeton Review, and The Wall Street Journal. Students attend full-time, although part-time is an option if the student is able to attend daytime classes. More>> (p. 336)

## About the execMBA (for working professionals)

**execMBA Director of Graduate Studies:** Zack Odem

This innovative executive MBA is specifically designed for high achieving professionals seeking a first-rate MBA program that provides flexibility around their work schedules. This is the same renowned degree and the same renowned faculty offered with the Crosby MBA, but is specially designed. More>> (p. 338)

## Cooperative Dual Degrees with the MBA Program

- MBA and Bachelor of Science Industrial Engineering (BSIE)
- MBA and Master of Health Administration (MHA)
- MBA and Master of Science in Industrial Engineering (MSIE)
- MBA and Juris Doctor (JD) Facilities and Resources

## Crosby MBA

**Contact Information Crosby MBA (daytime program)**

Office of Admissions  
 213 Cornell Hall  
 Columbia, MO 65211  
 573-882-2750  
[mba@missouri.edu](mailto:mba@missouri.edu)  
<http://mba.missouri.edu>

**Crosby MBA Director of Graduate Studies:** Joe Stephens

## About the Crosby MBA

Crosby MBA candidates come from all backgrounds, including science, engineering, liberal arts, journalism, business and health-related fields. There are no prerequisite courses. Our admission standards are high and the curriculum is rigorous. The Crosby MBA program is AACSB accredited, nationally recognized and highly ranked by Bloomberg Businessweek, U.S. News America's Best Graduate Schools, Forbes, and The Princeton Review. Students attend full-time, although part-time is an option if the student is able to attend daytime classes.

## Career Preparation

Through the Crosby MBA program, highly capable graduate students gain real-world experience that prepares them for a wide variety of career paths. The program teaches skills necessary to compete in the global business environment, and helps you achieve a career path that will bring both personal fulfillment and professional success. We offer individual career counseling, an executive mentoring program, employer site visits, and workshops focusing on resume writing, presentation skills,



negotiation skills and business etiquette. Students obtain employment in fields such as financial analysis, investments, banking, human resources, project management, strategy, operations and logistics, marketing, marketing analytics, consulting, and non-profit management.

## Financial Awards

Financial assistance in the form of both scholarships and research/teaching assistantships are available from the Crosby MBA program on a merit basis. Partial and full scholarships and tuition fee waivers are available for over half of our students. Graduate assistantships are usually quarter-time appointments involving 10 hours of work per week at \$5000 annually. Some students serve as instructors for undergraduate finance classes and are paid \$7600 annually for those positions.

## MBA Admission Requirements

Factors considered in the admissions decision include undergraduate grade point average (GPA), as indicated on the graduation transcript, with consideration given to other variables; performance on the Graduate Management Admissions Test (GMAT) or the GRE; work experience, including significant part-time employment and internships; demonstrated leadership; and personal essays. A baccalaureate degree in any discipline from an accredited school is required. Interviews by invitation will also be conducted. See the Crosby MBA website (<http://business.missouri.edu/programs-and-admissions/crosby-mba/admissions>) to apply.

## International Applicants

Applications are similar to those for domestic students, but an international student whose native language is not English is required to present an acceptable score on either the TOEFL or the IELTS.

Minimum **TOEFL** scores:

Pre-Defined Table

Internet-based test (iBT)	Paper-based test (PBT)
79	550

**Or**

Minimum Academic **IELTS** scores:

Item	Score
Listening	5.5
Reading	5.5
Writing	5.5
Speaking	5.5

Arrange to have your official scores sent directly to the University of Missouri - code is 6875. Include your scores in the "Test Information" section of the Graduate School's online application. Admitted international students are often encouraged to participate in the university's Intensive English Program (<http://iep.missouri.edu>) to strengthen their preparation for the MBA coursework. Please visit the MU Graduate School web site (<http://gradschool.missouri.edu>) for additional international applicant information, including the English Language testing requirement.

## Deadlines for Application for the Crosby MBA

Students enter in the fall semester. Deadlines are as follows:

November 15; January 1; February 15; April 1; rolling thereafter.

## Required Application Materials to the Crosby MBA

- Résumé and personal statement
- GMAT or GRE score
- TOEFL or IELTS (for international students)
- Transcript (you may upload an unofficial copy with your online application in addition to the official transcript required by the Graduate School)

Please see our website (<https://business.missouri.edu/programs-and-admissions/crosby-mba/admissions/apply-now-crosby-mba-program>) for detailed instructions about how to complete the required Graduate School application and submit these documents.

## Graduation Requirements for the Crosby MBA

Beginning Fall 2014, total graduate course work necessary to qualify for the Crosby MBA degree is 57 credit hours. For graduation, MBA students must earn a cumulative grade point average of 3.0 or better in the hours completed in the designated MBA plan of study and a minimum 3.0 cumulative MU graduate grade point average.

## Plan of Study

Required course work in Quantitative Analysis, Finance, Management, Marketing and Professional Development and Experiential Learning provides a comprehensive business education for Crosby MBA students. Our curriculum assures that graduates enter the 21st century business world with tools that will enable them to be successful. The program consists of 33 required credits, including foundational and advanced coursework, plus 24 elective credits.

The structure of the MU Crosby MBA allows students to concentrate in a specific area of business, develop a broad managerial focus, or complement business training with course work from other areas on campus. Areas of concentration are offered within the departments of finance, management, and marketing, including the marketing analytics concentration, or another field related to a student's individual interests. The delivery format includes 1.5 credit hour, 8-week modules, to allow for more focused attention to a particular topic, as well as to provide a wider array of choices. 3 credit, 16 week courses are also available.

## Sample Semester Plan

First Year			
Fall	Credits	Spring	Credits
1st 8 Weeks		1st 8 Weeks	
FINANC 7220	1.5	FINANC 7410	1.5
MANGMT 7400	1.5	MANGMT 7430	3
MANGMT XXXX: Intro to Strategy (New course offered in Fall 2014)	1.5	MANGMT 7470	1.5
MRKTNG 7460	1.5	Elective	1.5
2nd 8 weeks		2nd 8 Weeks	
BUS_AD 7050	1.5	BUS_AD 7340	1.5
MANGMT 7380	1.5	FINANC 7420	1.5
MANGMT 7420	1.5	Elective	1.5
MRKTNG 7470	1.5	16 week courses	

16 week courses		BUS_AD 8020	1
ACCTCY 7310	3	BUS_AD 8500	3
BUS_AD 8010	1		
	<b>16</b>		<b>16</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
1st 8 Weeks		1st 8 Weeks	
FINANC 8350	1.5	MANGMT 8970 (Credit hours changing to 1.5 as of Fall 2014)	3
Elective	1.5	Elective	1.5
Elective	1.5	Elective	1.5
Elective	1.5	Elective	1.5
Elective (optional)	1.5	Elective (optional)	1.5
2nd 8 Weeks		2nd 8 Weeks	
Elective	1.5	Elective	1.5
Elective	1.5	Elective	1.5
Elective	1.5	Elective	1.5
Elective	1.5	Elective	1.5
Elective (optional)	1.5	Elective (optional)	1.5
16 week courses			
BUS_AD 8030 (Leadership Development)	1		
	<b>16</b>		<b>16.5</b>
Total Credits: 64.5			

## Electives

### Accounting Electives

ACCTCY 8453	Taxes and Business Strategies	3
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### Business Administration Electives

BUS_AD 8600	Business Consulting	3
BUS_AD 8730	International Study Abroad	3-6

### Finance Electives

FINANC 7201	Special Topics in Finance	1-3
FINANC 7620	Investment Strategy of Warren Buffett	3
FINANC 7820	Investment Fund Management	3
FINANC 8001	Topics in Finance	1-3
FINANC 8070	Security Markets and Investments	3
FINANC 8320	Financial Markets	1.5
FINANC 8330	Investment Policy and Portfolio Management	1.5
FINANC 8340	Derivative Financial Securities	3
FINANC 8350	Financial Statement Analysis I	1.5
FINANC 8352	Financial Statement Analysis II	1.5
FINANC 8360	Equity Securities Analysis	1.5
FINANC 8370	Fixed-Income Securities Analysis	1-3
FINANC 8410	Advanced Financial Management	3
FINANC 8440	Financing Multinational Business	1.5
FINANC 8450	Ethics and Standards of Financial Practice	1.5
FINANC 8510	Management of Financial Institutions	3
FINANC 8530	Real Estate Portfolio Analysis	1.5-3
FINANC 8560	Real Estate Securities Analysis	1.5-3

### Management Electives

MANGMT 8001	Topics in Management	1-6
MANGMT 8054	Entrepreneurship and Media of the Future	3
MANGMT 8100	Exploring the Digital Globe	3
MANGMT 8330	Current Issues in Human Resource Management	3
MANGMT 8360	Negotiations	3
MANGMT 8370	Managerial Leadership	3
MANGMT 8400	Management Science Modeling	1.5
MANGMT 8410	Decision Making and Risk	1.5
MANGMT 8420	Decision Support Systems	3
MANGMT 8510	Project Management	1.5
MANGMT 8540	Entrepreneurial Ventures	3
MANGMT 8550	Launching a High-Growth Venture	3
MANGMT 8560	Legal Strategies for Entrepreneurs	3

### Marketing Electives

MRKTNG 8001	MBA Topics in Marketing	1-3
MRKTNG 8060	Competitive Marketing Strategy	1.5
MRKTNG 8070	Marketing Business Models	1.5
MRKTNG 8280	Research for Marketing Decisions	3
MRKTNG 8350	Business-to-Business Marketing	1.5
MRKTNG 8420	Sales Force Management	1-3
MRKTNG 8480	Relationship Marketing	1-3
MRKTNG 8520	Services Marketing	3
MRKTNG 8580	Product Management	1-3
MRKTNG 8680	Database Marketing	3
MRKTNG 8720	International Marketing	3
MRKTNG 8750	Brand Management	1.5
MRKTNG 8760	Marketing Engineering	3
MRKTNG 8770	Marketing Databases and SQL	3
MRKTNG 8780	Advanced Marketing Analytics	3

## execMBA

### Contact Information: execMBA Program

306 Cornell Hall  
 Columbia, MO 65211  
 (573) 882-2180  
[execmba@missouri.edu](mailto:execmba@missouri.edu)  
<http://execmba.missouri.edu>

**execMBA Director of Graduate Studies:** Zack Odem

## About the execMBA Program

This innovative executive MBA is specifically designed for high achieving professionals seeking a first-rate MBA program that provides flexibility around their work schedules. This is the same renowned degree and the same renowned faculty offered with the Crosby MBA Program, but is specially designed for full time working professionals.

## Curriculum

The program curriculum, designed with executives in mind, is inventive, practical and market-facing. Students will build skills that increase self- and global-awareness, develop strategic risk-taking, and heighten influence. Delivery is a blend of approximately 75% online and 25% in-class coursework. Students will amplify global expertise and value in the marketplace with an 8- to 10-day international residency. This lock-step,

cohort program – meaning students will take the same classes together in the same order – is conducive to personal interactions with the other high-level professionals.

## Cost

The execMBA program cost of \$67,500 includes tuition, all fees, the international residency, all required course materials and all group meals on campus for the entire 21 months. Prospective students may check with their employers about educational benefits, and the University of Missouri Financial Aid Office can provide information about loan availability.

## Admission Requirements for the execMBA

All applicants to the MU execMBA must have a minimum of 5-7 years of professional work experience, as well as a letter of endorsement from their employer to participate in the program. Other factors considered in admission include undergraduate GPA (a bachelor's degree in any discipline from an accredited school is required), demonstrated leadership experience and a personal statement addressing criteria outlined on the exec MBA website. Interviews by invitation will also be conducted.

## International Applicants

Applications are similar to those for domestic students, but an international student whose native language is not English is required to present an acceptable score on either the TOEFL or the IELTS.

Minimum TOEFL scores:

Item	Score
Internet-based Test (iBT)	79
Paper-based test (PBT)	550

Or

Minimum Academic IELTS scores:

Item	Score
Listening	5.5
Reading	5.5
Writing	5.5
Speaking	5.5

Arrange to have your official scores sent directly to the University of Missouri - code is 6875. Include your scores in the "Test Information" section of the Graduate School's online application. Admitted international students are often encouraged to participate in the university's Intensive English Program to strengthen their preparation for the MBA coursework. Please [visit the MU Graduate School web site](#) for additional international applicant information, including the English Language testing requirement.

## Application Deadline for the execMBA

The MU execMBA Program will accept applications for its Fall class beginning January 1st each year. Deadlines by round are as follows: Round 1: March 1; Round 2: June 1; rolling thereafter (space available basis).

## Required Application Materials

Please see our website for detailed instructions about how to complete the required Graduate School application and submit these documents.

- Completed Graduate School Application
- Personal Statement
- Résumé
- Transcripts (you may upload unofficial copies with your online application in addition to the official transcript required by the Graduate School)
- Letter of Endorsement from Employer
- TOEFL or IELTS (for international students only)
- GMAT and/or GRE scores will be considered, but are not a requirement for admission

## Good Standing

To remain in good standing for both the Crosby and execMBA programs, a graduate student must maintain a Graduate School and program cumulative grade point average of 3.0 or better. At the end of any semester, a graduate student whose cumulative grade point average is less than 3.0 is placed on academic probation. A student is subject to dismissal if the cumulative grade point average remains less than 3.0 or if, at any point, the student's semester or cumulative grade point average falls to less than 2.0.

## PhD in Business Administration

Jan Curry (grad@missouri.edu)

213 Cornell Hall

Columbia, MO 65211

573-882-2750

<http://business.missouri.edu/programs-and-admissions/phd>

PhD Program: Associate Dean Stephen Ferris

882-0181

## About the Doctorate in Business Administration

The PhD program is designed to prepare graduates for careers as effective university researchers and teachers or for senior research positions in business or government. A primary objective of the program is to train PhD candidates to become proficient researchers. Therefore, course work involves research activities such as literature review and critique, theoretical modeling, research design, computer-assisted empirical analysis and preparation of proposals and research papers. Another objective is to train students to become high-quality teachers. PhD candidates are provided the opportunity to teach undergraduate courses in their specialty area. In addition, students are expected to participate in national and regional academic conferences and are encouraged to work with faculty in developing individual research and teaching skills.

The PhD in Business Administration offers three concentration areas:

Finance (<https://business.missouri.edu/programs-and-admissions/phd/academics/business-administration/phd-concentration-finance>), Management (<https://business.missouri.edu/programs-and-admissions/phd/academics/business-administration/phd-concentration-management>) and Marketing. (<https://business.missouri.edu/programs-and-admissions/>)

phd/academics/business-administration/phd-concentration-marketing)  
The School of Accountancy offers a doctoral degree in Accountancy.

## Admission Criteria

Fall deadline: February 1

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GMAT score: Superior test scores
- Outstanding performance in previous academic work
- Maturity and potential required for making scholarly contributions to their field of interest

## Required Application Materials

### To the Graduate School

All required Graduate School documents

### To the Doctorate in Business Administration Program:

Departmental Application

3 letters of recommendation

GMAT scores

Statement by the applicant indicating the intended major area of study, career objectives and any other information deemed pertinent for consideration by the admissions committee

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details. Financial assistance (research and teaching assistantships) is generally awarded at the time of acceptance to the program. These assistantships are usually half-time appointments involving approximately 20 hours of work each week, with work split between teaching and research assignments.

Assistantships are supplemented by scholarships and summer teaching or research assignments to provide minimum financial support of at least \$21,001 annually. Additional scholarship and professional development funds are available. Educational fees are waived for holders of assistantships as well as the supplemental business course fee. The College provides each doctoral student with \$2,000 in development funds, and departments offer support for research projects and travel associated with research presentations at major academic conferences. A Medical insurance subsidy and discounts on University Book Store purchases are provided to holders of assistantships.

## Plan of Study and the Program Committee

During the first semester of course work, the PhD Coordinator, a member of the doctoral faculty from the major area of study (finance, management or marketing), serves as the student's faculty adviser.

By the end of the first year of course work, a student should make formal application for the doctoral degree and, after consultation with faculty, request appointment of a Doctoral Program Committee. This committee consists of at least three members from the student's major area of study and at least one member from each supporting area of study.

The Doctoral Program Committee conducts the qualifying examination and works with the student to design a plan of study that must include the following:

- 15 hours of business core course work to acquaint the student with the functional areas of business. These courses can be waived if the student has satisfactorily completed equivalent course work.
- An in-depth major concentration in the area of finance, management (organizational sciences) or marketing (minimum of 15 hours of 8000/9000-level courses).
- 2 support areas of at least 9 hours each, one of which must be taken outside the School of Business, or one support area of at least 12 hours. These supporting areas offer the student considerable latitude in identifying a course of study that can be tailored to the individual's interests and goals. If two support areas are selected, the student must also satisfy a 12-hour analytical tool requirement; if one support area is selected, the analytical tool requirement is 18 hours.
- Collateral requirements emphasizing analytical tools (proficiency in a foreign language does not fulfill the collateral requirements). This is a research methods and analyses sequence of at least 12 hours (at least 18 if only one support area), including appropriate courses in economics, mathematics, psychology, sociology, statistics or other areas deemed appropriate by the program committee.
- An ongoing seminar experience (each semester until successful completion of comprehensive examinations) that acquaints the student with current literature and research in his/her major area of interest. This seminar is in addition to other seminars offered departmentally (4 hours minimum).
- Dissertation (minimum 12 hours of 9090 credit).

## Counting Credits

The plan of study requirements listed above are independent of one another; courses taken to satisfy one requirement may not be used to satisfy any other requirement. Previous graduate work taken before admission to the PhD program may be used to satisfy these requirements if it is deemed appropriate by the student's program committee.

## Residency Requirement

In compliance with University regulations, the doctor of philosophy degree requires the completion of 72 semester hours of graduate work beyond the baccalaureate degree. Within the credit-hour requirement is the residency requirement. To satisfy the residency requirement, a student must complete at least 2 9-hour semesters or 3 6-hour semesters in an 18-month period at MU. All courses taken to satisfy the residency requirement must be MU courses approved for graduate credit and approved by the student's doctoral program committee. Correspondence and off-campus courses may not be counted toward the residency requirement. This program is designed for full-time students and typically requires a 4-year on-campus commitment.

## Comprehensive Examination

Typically, after completion of the course work specified on the plan of study, the student's doctoral program committee determines the student's readiness to undertake the comprehensive examination. The student must be enrolled at MU the semester s/he takes this examination.

The comprehensive examination consists of written and oral sections. Both sections must be completed within one month of each other, and at least seven months before a final dissertation defense. Successful completion of the comprehensive examination requires that the student's

doctoral program committee vote to pass the student on the entire examination, both written and oral sections, with no more than one dissenting or abstaining vote. The student who fails this exam may not take a second comprehensive examination for at least 12 weeks. Failure to pass two successive comprehensive examinations automatically prevents candidacy.

## **Annual Review**

The progress of all PhD students is reviewed annually. This review considers student progress in course work and in teaching and research development. In addition, student performance on assistantship assignments is considered, as is student professional conduct and motivation for PhD study. The review is coordinated by the chair of the student's doctoral program committee. It includes a student self-evaluation, input from faculty familiar with the student, discussion with the student and a written evaluation letter.

## Additional Minors and Certificates - Business

### Undergraduate

- Certificate in Sales and Consumer Development (p. 342)

### Graduate

- Certificate in Accounting Information Systems (p. 342)
- Certificate in Taxation (p. 342)

## Undergraduate

### Certificate in Sales and Consumer Development

#### Certificate in Sales and Consumer Development Overview

The Certificate in Sales and Consumer Development prepares undergraduate students for careers in the highly professional and dynamic field of sales. Through the Certificate's required practices in the sales profession and sales management.

Students who finish the 13 credit-hour curriculum will receive the Certificate in Sales and Consumer Development upon completion of their bachelor's degree, thereby offering to employers tangible evidence of a strong background in sales.

#### Certificate Requirements and Curriculum 13

Required Courses - A minimum 3.00 GPA is needed in these three courses 9

MRKTNG 3000	Principles of Marketing	
MRKTNG 4410	Personal Selling	
MRKTNG 4420	Sales Management	
<b>Elective Course - Choose one</b>		<b>3</b>
MRKTNG 4220	Consumer Behavior	
MRKTNG 4250	Retail Marketing	
MRKTNG 4440	Services Marketing	
MRKTNG 4550	Integrated Marketing Communications	

Note: for the purposes of this Certificate, a student can transfer in credit from another institution only for MRKTNG 3000

**Internship Requirement (Minimum 1 credit hour) \*** 1

- \* Satisfactory completion of at least one credit hours for a supervised internship (summer or regular semester), with significant customer contract and a minimum of 120 hours on-the-job experience. This credit hour can be earned in any College at MU. Internships that qualify for this Certificate will need to be approved by the Program Coordinator as a part of the Certificate application process.

**Note:** Many Trulaske College of Business students will be able to satisfy the internship requirement by completing a suitable internship under the College's BUS\_AD 4500 requirement. But if a student has already completed BUS\_AD 4500 with an internship that does not meet the requirements of this Certificate program, that individual would be advised to register for one credit hour under MRKTNG 4185 for an internship that would qualify.

Non-business majors should contact the Program Coordinator, salescertificate@missouri.edu, regarding the internship component.

## Graduate

### Graduate Certificate in Accounting Information Systems

The College of Business is not currently accepting applications for the Graduate Certificate in Accounting Information Systems.

### Graduate Certificate in Taxation

School of Accountancy  
303 Cornell Hall  
573-882-4463

For more information, contact Phyllis Moore (moorepa@missouri.edu).

#### About the Certificate

Depending on the course configuration in the program, completion of the Certificate in Taxation indicates that a student has developed expertise in tax planning and preparation in regard to international, federal, state, or estate issues for corporations, partnerships, or individuals.

#### Eligibility

Students must be enrolled in the M Acc graduate degree program in the School of Accountancy at MU to be eligible for the certificate.

#### Plan of Study

Students are required to complete 15 credit hours to receive the certificate.

#### Required Courses

ACCTCY 7353	Introduction to Taxation	3
ACCTCY 8423	Tax Research and Planning	3
ACCTCY 8373	Taxation of Corporations and Shareholders	3
ACCTCY 8383	Taxation of Flow-Through Entities	3

#### Elective Courses

Select one of the following:	3
ACCTCY 8393 Taxation of Trust, Gifts and Estates	

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ACCTCY 8453 Taxes and Business Strategies

Total Credits

15

## College of Education

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### Administration

Daniel Clay, Dean and Joanne H. Hook Dean's Chair in Educational Renewal

### College of Education Operations Center

Kathyn Chval, Associate Dean, Academic Affairs

Mike Pullis, Associate Dean, Administration, Research & Continuous Improvement

(573) 882-7832

[www.education.missouri.edu](http://www.education.missouri.edu)

[umccoecertinfo@missouri.edu](mailto:umccoecertinfo@missouri.edu)

The College of Education, established in 1868, is the oldest teacher preparation program west of the Mississippi River. Today's graduates of the college are employed in a variety of educational institutions and non-school settings. The college serves the educational community through research-based professional practice and a variety of learning constructs applied to real-world experiences. The college is a member of the American Association of Colleges for Teacher Education and a candidate member of the Teacher Education Accreditation Council. All programs are fully accredited by the North Central Association of Secondary Schools and Colleges.

All programs that lead to earning a certificate by the Missouri Department of Elementary and Secondary Education (DESE) are fully approved by the State Board of Education. DESE accredits all teacher certification programs at MU. The Office of Educator Quality at DESE is working with representative stakeholder groups to redesign the standards for educator preparation including certification requirements. These changes and implementation schedule will be communicated to students through individual advising sessions, meetings, and/or other university communications. If there are any questions and/or concerns, please contact the Director of Educator Preparation in the Office of Educator Quality.

### Undergraduate

- Admissions
- Academic Regulations
- Academic Affairs
- Academic Programs
- Teacher Certification

The Bachelor of Science in Education (BSEd) degree offers programs with the following certification levels:

- Early Childhood Education (Birth-Grade 3)
- Elementary Education (Grades 1-6)
- Middle School Education (Grades 5 - 9)
- Secondary Education (Grades 9-12)
- Special Education, Art, and Music (Grades K-12)

The total undergraduate enrollment in the College of Education for 2011-2012 was 1278. Clinical faculty with a 6:1 student/faculty ratio supervise this 640-hour experience.

### Admissions

Even for students meeting selective admission criteria, admission to some program areas is dependent on capacity, resulting in the selection of the best-qualified applicants. In addition to meeting minimum Phase II criteria, the faculty may exercise professional judgment in the selection of students through personal interviews and program specific essays.

Admission to a specific program is a prerequisite to many upper-level education courses and associated field experiences (including the teaching internship). A student admitted to a professional program (Phase II) must maintain the standards met at the time of admission. Continued assessment will be made of the characteristics associated with effective performance in the role of a professional at each level and in the program. See specific requirements for admission to each of the three phases of the chosen major.

### Freshmen

Undergraduate students may enter the College of Education as first-year students at MU.

### Transfer Students

The College of Education accepts transfer students consistent with the transfer/articulation policy of the Missouri Department of Higher Education. The transfer policy does not waive or alter any course requirements for the Bachelor of Science in Education or the Bachelor of Educational Studies degrees. Grades received from other accredited institutions are recorded on the MU transcript as they were earned (A = A, etc.). Courses from other University of Missouri institutions are calculated into the UM GPA of Record and grades received from other accredited institutions are calculated into the overall grade point average for admission to the College of Education.

Students transferring to the College of Education with a completed Associate of Arts (AA) degree from a Missouri institution will be considered to have completed the first two years of university general education requirements. Students transferring with a completed Associate of Arts in Teaching (AAT) degree from a Missouri institution will be considered to have completed the first two years of university general education and lower division (Phase I) professional education coursework. Additional course work may be needed to satisfy prerequisites or degree requirements for Phase II and Phase III of the chosen program.

### International Students

International students enrolled in the BS Ed program must have earned a score of 600 (paper-based) or 100 (internet-based) on the TOEFL exam. International students enrolled in the BES program must have a score of 550 (paper-based) or 79 (internet-based) on the TOEFL exam.

### Exploratory Courses

Students wishing to explore Teacher Education may enroll in LTC 11XX for 1 credit hour in the emphasis area of interest.

### Preprofessional Information

Many of the program areas contain preprofessional course work that must be completed with specific course grades prior to the selective admission process for Phase II of the program or the teaching internship (Phase III). Contact the Academic Advising and Certification Services Office for the specific course work required for the area of interest.



## Grade Point Average

The College of Education uses the UM GPA of record to assess students' academic standing and progress. Both the UM GPA of record and overall grade point average at the level required are used to determine eligibility for admittance and progression. (see Calculation of Grade Point Averages below for levels)

## Time Limits on Credits Earned

Transfer credit is evaluated by the Office of Admissions. All course work must meet the current state minimum requirements for teacher certification. Course work completed in the discipline must be evaluated by faculty within that area to be applicable.

## Academic Regulations

### Calculation of Grade Point Averages (GPA)

To remain in good standing with the college, a BSEd student must earn a minimum UM term and cumulative GPA of record, as described below:

Credits	BSEd GPA	BES GPA (Non-Certificate)
0-29	2.600	2.500
30-59	2.700	2.500
60 credits and above	2.750	2.500

### Satisfactory/Unsatisfactory Grades

In addition to University policies on S/U grading, professional education courses, excluding field experiences and orientation, may not be completed under the S/U grading system.

### Advanced Standing

In addition to University standards for advanced-standing credit, content courses, as defined by teacher certification, must be completed with an UM cumulative GPA of record of 3.000 or better to satisfy Missouri requirements for certification. Advanced-standing credit includes course work used to satisfy degree requirements, including any elective portion of the degree program.

Courses taken from other institutions after students have matriculated to UM must have prior approval.

### Probation, Suspension and Dismissal

A student in good standing (see Calculation of Grade Point Averages above) whose MU GPA of record and/or cumulative grade point average falls below the level outlined is placed on scholastic probation. In addition, any student admitted to the College of Education who does not meet the minimum entrance standards (e.g., admitted to MU by the Committee on Entrance and Revision of Records, admission due to extenuating circumstances or admission of a returning student) will enter on scholastic probation.

A student on scholastic probation whose MU term grade point average for a subsequent enrollment semester is at or above the level specified, but whose UM cumulative grade point average is below the level required for good standing is placed on conditional scholastic probation. A student may be on conditional scholastic probation for two enrollment semesters only. If the MU cumulative grade point average is not at the level required for the student's classification at the conclusion of the

period of conditional scholastic probation, the student is ineligible for continued enrollment in the College of Education.

A student whose MU term and cumulative GPA of record falls below 2.000 is ineligible for enrollment at MU. (Exception: a first-semester freshman whose UM term GPA is below 1.000 may, at the discretion of the associate/assistant dean for academic programs, be placed on conditional scholastic probation instead of being declared ineligible.)

### Capstone Options

All students graduating from the College of Education are required to complete a capstone experience. For students completing a BSEd, the internship experience (Phase III) serves as the capstone. For the BES degree, a minimum two hour capstone is required in collaboration with a faculty member in the College of Education.

### Graduation Requirements

University requirements state that students must earn 30 of the last 36 credits applicable to their degree in MU courses. For the BSEd, these courses must include the student teaching internship. For the BES, they must include an approved capstone course for a minimum of two semester hours.

### Graduation with Departmental Honors

The College of Education maintains a Dean's List that includes all College of Education undergraduates who are enrolled in 12 or more credits of graded (A-F) course work, and who have a 3.500 or higher MU term GPA.

The College of Education awards Latin Honors designations will be based on the Spring graduates each year, and those GPAs will determine the levels that will be applied to Summer and Fall graduates during that calendar year. The top 5% will receive Summa Cum Laude distinction, the next 10% Magna Cum Laude, and the remaining 15% Cum Laude for each of the program area categories (Early Childhood and Elementary, Middle School, Secondary/K12, and Special Education).

Students must earn a minimum of 60 credits on the MU campus to be eligible for Latin Honors designation. Determination of eligibility is will be based on either the cumulative MU GPA of record, or the MU GPA for the last 60 hours of credits, whichever is greater.

In no case will a Latin Honors designation be conferred for an individual whose overall MU GPA is less than 3.6.

In addition, College of Education students may participate in a University Honors Program. (See the Honors College (p. 641) information on this site).

## Academic Affairs

The College of Education offers services to assist undergraduate students interested in pursuing a degree in Education.

### Academic Advising & Certification Services

101/102 Hill Hall  
573-882-5659  
Education\_advising@missouri.edu

The Academic Advising and Certification Services office located in 101/102 Hill Hall, is dedicated to the academic, professional and personal success of all students. The office is committed to building a one-on-one professional collaborative relationship that empowers students to

explore opportunities and develop and implement individual academic and life goals. Meeting with a professional advisor early and regularly is a necessary component of this relationship. Degree choice and requirements, campus involvement, academic struggles, study abroad options, graduate school program and the certification process are just a few of the many topics that can be explored in working with a professional advisor.

## Education and Career Services

105 Hill Hall  
573-882-5069

The Education Career Services Office, located in 105 Hill Hall, specializes in the development of cover letters and resumé, preparation for interviews, and implementation of an effective job search. Students will find considerable support in building a professional, self-managed credential file needed for the field of education. In addition, this office provides information about job openings, school district contacts, and career fairs, as well as hosts on-campus interviews with potential employers.

Students will find additional assistance at [www.hiremizzoutigers.com](http://www.hiremizzoutigers.com) (<http://www.hiremizzoutigers.com>), but also the Education Career Services website at <http://caps.missouri.edu>, which contains extensive resources exclusively for the job seeker in the field of education.

## Office of Recruitment and Retention Initiatives

104 Hill Hall  
573-882-7772

The Office of Recruitment and Retention Initiatives, located in 104 Hill Hall, serves as a welcome center for prospective and current students as well as their families. Through student tours and recruitment events, the staff showcase the College of Education and highlight opportunities and services provided to our students. The staff advise and assist prospective students in understanding College of Education degree programs, admission requirements, and financial assistance options. In addition, the office provides programs and initiatives tailored towards the recruitment, retention, and matriculation of underrepresented student populations.

## Office of International and Intercultural Initiatives

218 Townsend Hall  
573-882-0732

The office of International and Intercultural Initiatives, located in 218 Townsend Hall, designs initiatives and supports undergraduates as they develop cultural competence and intercultural understanding through foreign and domestic experiences. These experiences include on campus multicultural events and activities, as well as study/teach abroad opportunities in Italy, Ghana, Tanzania, Australia/New Zealand, South Korea, India, South Africa, Jakarta, Thailand; and service learning opportunities in organizations such as Centro Latino, Columbia Public Schools and Granny's House.

## Office of Scholarship Services

102C Hill Hall  
573-884-7848  
[coescholarships@missouri.edu](mailto:coescholarships@missouri.edu)

The Office of Scholarship Services helps students pursue scholarships and fellowships. This office disseminates information about scholarship opportunities and deadlines to current and potential students. Incoming Freshmen become eligible for College of Education scholarships when they submit their MU Annual Scholarship Application, due December 1st of each year. Returning and Transfer Students become eligible for College of Education scholarships when they submit their MU Annual Scholarship Application, due by February 1st each year. The Scholarship Coordinator then assists the Financial Awards Committee, which consists of College of Education faculty members, as they determine recipients based on the criteria for each scholarship.

The scholarship website lists the numerous scholarships available for undergraduate students majoring in Education: [http://education.missouri.edu/academics/financial\\_assistance/scholarships-undergraduate.php](http://education.missouri.edu/academics/financial_assistance/scholarships-undergraduate.php)

## Teacher Education

### Office of Teacher Education

202 Townsend Hall  
573-882-0560  
[TeacherEducation@missouri.edu](mailto:TeacherEducation@missouri.edu)

The Teacher Education Office is committed to supporting students as they progress through the phases of their academic career including answering general questions about all aspects of the program and making sure that you are enrolled in the appropriate education courses. This office works in conjunction with all CoEd departments in Academic Affairs, to provide the best educational experience for our students.

### Field Experience Office

202 Townsend Hall  
573-882-4364

The Field Experience Office supports students in all phases leading up to and including the student teaching internship. The professional staff make regular contact with school district faculty and administrators in Columbia and around the state to assure that students encounter high-quality field experiences where they gain knowledge and assume progressive responsibilities within classroom settings. In addition, the office provides guidance to any student who requests additional help to prepare for student teaching.

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## Academic Programs

### College of Education Requirements - BSEd

In addition to University general education and graduation requirements, students must complete the following degree requirements and additional major (and in some cases emphasis and option) requirements.

- Oral communication proficiency (demonstrate competency on communication standards in Phase I, II, and III of the Teacher Education course work)
- Computer and information proficiency (demonstrate competency on technology standards in Phase I, II, and III of the Teacher Education course work)

- HIST 1100, , HIST 1200, HIST 1200H, HIST 2210, or POL\_SC 1100 (course may also be used as part of the behavioral and social science portion of University general education requirements)
- World international requirement: All majors must complete a course that reflects the study of world/international topics (course may also be used as part of the humanities and/or fine arts portion of University general education requirements) or a study abroad experience
- Multicultural studies requirement: Students address this requirement by demonstrating competence on diversity standards in Phases I, II, and III of the Teacher Education course work.

## College of Education Requirements - BES

In addition University general education and graduation requirements, students must complete the following degree requirements and additional major requirements.

- Twenty-four hours of education coursework with a 2.500 cumulative and overall GPA
- Twenty-four hours of coursework focusing on a particular concentration
- Completion of a graduation check in collaboration with a professional advisor once 60 credit hours of coursework are completed
- World international requirement: All majors must complete a course that reflects the study of world/international topics (course may also be used as part of the humanities/fine arts portion of University general education requirements) or a study abroad experience
- Multicultural studies requirement; students address this requirement by demonstrating competence on diversity standards in their education coursework.
- Students will complete a two hour minimum capstone course in collaboration with a faculty member in the College of Education.

## Professional Education

The College of Education professional education requirements include those that are common to all majors as well as requirements that are specific to each major. Students must meet the following requirements:

- Course GPA of 2.000 or better with an overall professional education GPA of at least 3.000 (required for Missouri Teacher Certification)
- UM GPA of record and overall GPA of 2.750
- GPA of 3.000 in the content area for students majoring in a degree leading to certification in a subject (K–12, 9–12, 5–9 or PK-3)

## Teacher Education Courses

Students proceed through three phases as they complete the baccalaureate program. Each phase includes training in technology as well as clinical experience. University general education and content requirements are completed each semester in addition to the required program area courses.

### Phase I

This phase provides students with an immersion into the discipline and culture of teaching and learning before focusing on a teaching specialty. It includes five courses for a total of 9 credits: LTC 11XX, ESC\_PS 2010 and ESC\_PS 2014, LTC 2040 and LTC 2044. Experiences in this phase incorporate the teacher's roles in facilitating learning at all levels of development. Students also focus on how problems of schools, family, community and society affect educators. The emphasis in Phase I is on career exploration and oral and written communication. All students in the BSEd degree program complete these courses regardless of major.

Students majoring in Special Education complete an additional course in Phase I, SPC\_ED 4300, for a total of 12 hours in Phase I.

### Phase II

This phase occurs over a three-semester sequence and focuses increasingly on a chosen teaching emphasis and on interdisciplinary teaching. Experiences in this phase focus on instructional strategies, human development, classroom and behavior management and educational measurement. This phase provides students with experience in the methods of teaching in a specific subject area as well as emerging problems and practices within the field of education. Certain degree programs have limited enrollments. The number of credits is dependent on the selected program. See specific majors for courses required in Phase II.

Application to Phase II is required. Students become eligible for consideration for admittance to Phase II in a specific program after meeting the following criteria:

- Current enrollment in the College of Education
- 2.750 UM GPA of record and overall GPA (on a 4.000 scale)
- Passing score on the Missouri General Education Assessment
- ENGLSH 1000 with a "C" range grade or higher
- MATH 1100 with a "C" range grade or higher
- COMMUN 1200 or equivalent with a "C" range grade or higher
- Demonstration of competence of Phase I learning markers as demonstrated by satisfactory completion of Phase I courses (LTC 11XX, grade of "S"; ESC\_PS 2014 and LTC 2044, grade of "S" in each course; ESC\_PS 2010 and LTC 2040, grade of "C" (2.00) or higher in each course)
- Demonstrated competence of Phase I mid-preparation benchmarks (as documented by Phase I instructors)
- Additional requirements as designated by the faculty
- Possession of characteristics associated with effective performance in a professional role at the level(s) and in the major(s) selected
- Completion of application for progression

### Phase III

Phase III occurs during the last semester (or last year) with student placement in a public school district for the entire semester, for approximately 16 weeks (14 credit hours).

Application for Phase III is required. To qualify for the teaching internship, applicants must meet the following requirements:

- Admission to Phase III in the program area
- Successful completion of Phase II
- A minimum of 90 completed credit hours
- Completion of at least the preceding semester in residence
- A minimum 2.750 UM GPA of record and an overall GPA of 2.750 (on a 4.000 scale)
- Completion of specific prerequisite professional education and subject area course requirements for the level at which the teaching internship is to be accomplished

Teaching internship placements are available in several districts across the State of Missouri. Applications are accepted approximately a year preceding internship. More information concerning student teaching internships may be obtained from Field Experience Office, 202 Townsend Hall, in the College of Education.

## Teacher Certification

### Licensures

Completion of the BSEd and any additional requirements for certification must be completed before the graduate is eligible for an Initial Professional Certificate from the Department of Elementary and Secondary Education in the State of Missouri.

Recommendation for initial certification after graduation requires:

- Passing score on the Content Area Exam for each major (the examination should be taken during the last year of the program and official scores submitted to the University of Missouri)
- Official transcripts with the degree posted submitted to Advising & Certification Services in 101 Hill Hall
- Submission of an IPC application from the DESE web application website (<https://k12apps.dese.mo.gov/webLogin/login.aspx>) to MU
- The Department of Elementary and Secondary Education also requires that students seeking additional certification in other teaching subjects take the Content Area Exam in those additional subjects in order to be considered a Highly Qualified Teacher.

A student recommended for teacher certification must meet the following criteria:

- Cumulative UM GPA of record of 2.750
- Overall GPA of 2.750 for all college course work completed
- Cumulative GPA of 3.000 in all content area course work
- 2.000 in each professional education course with overall 3.000 GPA on all professional education course work
- Satisfactory score on the Content Area Exam required by the State of Missouri
- An official copy of the student's transcript with baccalaureate degree posted submitted to the Advising & Certification Services office in 101 Hill Hall
- Complete online application for an Initial Professional Certificate through the Department of Elementary and Secondary Education (DESE) web application

[Back to Top](#)

## Graduate

Now is an exciting time to pursue graduate studies in the College of Education. A range of professional and continuing education degrees are available, many with specializations.

Our 122 faculty mentors create a rich environment as they are not only involved in teaching, but also heavily invested in research programs and centers. Faculty members balance their research efforts with student coordination and guidance. Choosing the right college for graduate studies is not an easy or simple decision. We welcome you to visit the MU Columbia campus and meet with our faculty and current students to find out more about life in the College of Education.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Early Childhood Education

Dr. Wendy Sims, Director of Teacher Education  
 Department of Learning, Teaching and Curriculum  
 202 Townsend Hall  
 573-882-0560  
 TeacherEducation@missouri.edu

Professional education coursework is delivered by four departments within the College of Education, namely, Learning, Teaching and Curriculum; Special Education; Educational Leadership and Policy Analysis; and Educational, School and Counseling Psychology.

### Faculty

**Professor** E.A. Baker\*, L. H. Barrow\*\*, J. Baumann\*\*, B. Dougherty\*\*, R. F. Fox\*\*, A. Hoard\*, S. Palonsky\*\*, B. B. Reys\*\*, R. E. Reys\*\*, R. D. Robinson\*\*, T. Sadler\*\*, W. Sims\*\*

**Associate Professor** L. Bennett\*\*, K. B. Chval\*\*, P. J. Friedrichsen\*\*, C. Gilles\*\*, D. L. Hanuscin\*\*, N. Knipping\*, J. Lannin\*\*, J. E. Tarr\*\*, K. Unrath\*\*

**Associate Professor Emeritus** M. Volkmann\*\*

**Assistant Professor** T. Castro\*\*, Z. de Araujo, M. Klosterman\*, C. Kuby\*\*, A. Lannin\*\*, M. Major\*, S. Otten, R. Pinnow\*, L. Sanchez\*\*, M. Siegel\*\*, B. Silvey\*\*

**Emeritus Research Professor** D. A. Grouws\*\*

**Associate Teaching Professor** A. Barbis\*, L. Kingsley\*, J. Ostrow\*

**Assistant Teaching Professor** A. Ashcraft\*, J. Clifton\*, L. Neier\*, B. Smith\*

**Assistant Clinical Professor** A. Waldron\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 349)
- BSEd in Early Childhood Education (p. 349)

The requirements for the Bachelor of Science in Education are specified in three areas: University general education, professional education and a teaching major. All students preparing to be teachers in early childhood, elementary, special education, middle or secondary schools, regardless of the major field, are required to complete the University general education program. Students transferring from other institutions are required to fulfill the equivalencies of these courses.

### Graduate

The Early Childhood Education Program at the University of Missouri includes degree programs that focus on preparing graduates to teach in grades Birth-3. The College of Education offers a Masters (M.Ed.) and a doctorate (Ph.D.) in Learning, Teaching and Curriculum with an emphasis in Early Childhood Education. You can find out more information about the graduate program at [http://education.missouri.edu/LTC/\\_language\\_society\\_culture/\\_old-pages/early\\_childhood.php](http://education.missouri.edu/LTC/_language_society_culture/_old-pages/early_childhood.php).

### Courses

Courses on Early Childhood Education can be found within the subject area of Learning, Teaching and Curriculum (LTC).

## Undergraduate

### Department Level Requirements - Early Childhood Education

The BSEd in Early Childhood Education does not contain any departmental requirements.

### BSEd in Early Childhood Education

#### Major Program Requirements

Students must complete all university, general education, and content requirements, in addition to the degree requirements below

Professional Education		73
Phase I		
LTC 1100	Orientation	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
Phase II		
LTC 4091	Early Childhood Seminar I	2
LTC 4110	Working with Infants and Toddlers	3
LTC 4120 & LTC 4124	Emergent and Developing Literacy in Early Childhood and Emergent and Developing Literacy Early Childhood Field Experience	7
LTC 4200	Young Children's Emergent Language	2
LTC 4210	Children's Literature	2
SPC_ED 4020	Inquiry into Learning II	3
LTC 4130 & LTC 4134	Teaching and Learning Math, Science and Social Studies w/ Young Children and Teaching & Learning Math, Sci & Soc Studies w/Young Children Field Experience	11
H_D_FS 4720	Child and Family Advocacy	2
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4140	Early Childhood Seminar II	3
LTC 4160	Motor Development in Young Children	2
LTC 4240	Art for Children	2
LTC 4250	Music for Children	2
H_D_FS 3700 or LTC 4170	Child Development Laboratory Pre-Kindergarten Student Teaching	6
Phase III		
LTC 4971	Internship and Capstone Seminar	14

## Additional Subject Requirements

NUTR_S 1034	Nutrition, Current Concepts and Controversies	3
H_D_FS 3420	Early and Middle Childhood	3
H_D_FS 2300	Multicultural Study of Children and Families	3
or H_D_FS 4300	Black Families	

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1100	1	ENGLSH 1000	3
MATH 1100	3	STAT 1200	3
BIO_SC 1010	3	POL_SC 1100	3
BIO_SC 1020	2	MUSIC_NM 1618 (or Art)	2
HIST 1100	3	COMMUN 1200	3
PSYCH 1000	3		
	<b>15</b>		<b>14</b>
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
H_D_FS 3420	3	Arts & Science Elective	3
PHYSICS 2330	4	NUTR_S 1034	3
SOCIOL 1000	3	H_D_FS 2300	3
English Literature	3	Humanities/World International	3
	<b>17</b>		<b>16</b>
Third Year			
Fall	Credits	Spring	Credits
LTC 4091	2	H_D_FS 4720	2
LTC 4110	3	LTC 4130	8
LTC 4120	5	LTC 4134	3
LTC 4124	2	SPC_ED 4020	3
LTC 4200	2		
LTC 4210	2		
	<b>16</b>		<b>16</b>
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14
LTC 4140	3		
LTC 4160	2		
LTC 4240	2		
LTC 4250	2		
LTC 4170 or H_D_FS 3700	6		
	<b>18</b>		<b>14</b>
Total Credits: 126			

## Educational and Counseling Psychology

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ESCP provides a diverse, supportive, and caring environment for students. Our faculty members create rich and stimulating learning opportunities through their teaching, research, and service. Our faculty are more than academic advisors and teachers - they are mentors providing students with role models featuring the scientist-practitioner model.

### Faculty

**Professor** M. Heppner\*\*, J. A. Johnston Jr.\*\*, S. J. Osterlind\*\*, J. Wedman, R. L. Worthington\*\*

**Associate Professor** D. A. Bergin\*\*, L. Y. Flores\*\*, C. L. Frisby\*\*, K. Herman\*\*, M. Martens\*\*, W. M. Reinke\*\*, T. C. Riley-Tilman\*\*, A. Waigandt\*\*, S. D. Whitney\*\*

**Assistant Professor** D. L. Carr\*, M. A. Maras\*\*, A. Morales\*\*, K. T. Wang\*\*, Z. Wang\*\*

**Associate Teaching Professor** K. Boggs\*, R. J. Scholes\*\*, B. Williamson\*

**Assistant Teaching Professor** R. T. McGuire Jr.\*, C. A. Offutt\*\*

**Assistant Clinical Professor** C. M. Brooks\*\*, A. J. Knoop\*\*

**Assistant Research Professor** L. Newcomer\*

**Curator's Professor** N. C. Gysbers\*\*, P. P. Heppner\*\*

**Dean of Education** D. L. Clay

**Professor Emeritus** J. W. Alspaugh\*, R. B. Caple, R. Cox, R. A. English, J. R. Koller, J. T. Kunce, J. F. McGowan, M. J. Patton, R. W. Thoreson, R. R. Trimble, F. E. Wellman, V. R. Wheeler

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in educational and counseling psychology, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Education, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

College of Education

14 Hill Hall

573-882-7732 or 573-884-5989

<http://education.missouri.edu/ESCP/>

**Director of Graduate Studies:** David Bergin

- MA in Educational and Counseling Psychology (p. 351)
- MEd in Educational and Counseling Psychology (p. 352)
- EdSp in Educational and Counseling Psychology (p. 352)
- PhD in Educational and Counseling Psychology (p. 353)

### About the Program

The department offers master's, educational specialist, and PhD degrees in across several emphasis areas:

- Emphasis: Counseling Psychology (M Ed, EdSp, PhD)
- Emphasis: Educational Psychology (MA, M Ed, PhD)
- Emphasis: Health Education & Promotion (MA, M Ed, PhD)
- Emphasis: School (EdSp, PhD) **CHECK: APA Accredited, but on probation**

The PhD programs in counseling psychology and school psychology is accredited by the American Psychological Association. The 2005 Faculty Scholarly Productivity Index ranked MU's graduate program in counseling psychology 4th in the nation and the 2010 U.S. News & World Report ranked it 9th nationally.

Our faculty members create a rich and stimulating learning environment for students through their teaching, research, and service. ESCP has three centers that provide students and faculty with many opportunities to collaborate on research and service-related projects while focusing on improving life for learners in all environments.

### Career Opportunities

Our graduates find employment in a wide range of settings, including colleges and universities, public schools, agencies, clinics, hospitals, business and industry, research laboratories and government service. Occupations include, but are not limited to, school counselors, licensed professional counselors, faculty members, school psychologists, psychometricians, health educators and educational researchers.

### Application Deadlines

- Fall deadline: December 1st for all programs except Educational Psychology, which is January 15th
- M Ed/MA in Health Education & Promotion - rolling deadline
- Career & Sport Psychology- rolling deadline
- M Ed, EdSp track in Mental Health Practices in Schools (online degrees) - rolling deadline
- M Ed track in Positive Coaching (online degree) - rolling deadline

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

### Graduate

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## MA in Educational and Counseling Psychology

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### Admission Contact Information

LaToya Luther ([lutherl@missouri.edu](mailto:lutherl@missouri.edu))

14 Hill Hall; Columbia, MO 65211

573-882-7732

## Admission Criteria

- Minimum GPA: 3.0
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
92	580

- Recommended GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 1000 2011		4.0
On or After August 1, 2011	300	4.0

Recommended Analytic Writing score = 4

## Application Deadlines

- Fall deadline: December 1st for all programs except Educational Psychology, which is January 15th
- M Ed/MA in Health Education & Promotion - rolling deadline
- Career & Sport Psychology- rolling deadline
- M Ed, EdSp track in Mental Health Practices in Schools (online degrees) - rolling deadline Deadlines

**Note:** If an applicant is admitted but does not hold a bachelor's degree in a related discipline or does not have relevant background course work, the applicant must complete prerequisite courses as specified by the faculty of the department.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- Official transcripts
- GRE scores
- TOEFL scores 3 letters of recommendation via the online application
- Personal statement and vitae via online application per departmental requirements

## MEd in Educational and Counseling Psychology

### Admission Contact Information

LaToya Luther (lutherl@missouri.edu)  
 14 Hill Hall; Columbia, MO 65211  
 573-882-7732

### Admission Criteria

- Minimum GPA: 3.0
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
92	580

- Recommended GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 1000 2011		4.0
On or After August 1, 2011	300	4.0

Recommended Analytic Writing score = 4

## Application Deadlines

- Fall deadline: December 1st for all programs except Educational Psychology, which is January 15th
- M Ed/MA in Health Education & Promotion - rolling deadline
- Career & Sport Psychology- rolling deadline
- M Ed, EdSp track in Mental Health Practices in Schools (online degrees) - rolling deadline Deadlines

**Note:** If an applicant is admitted but does not hold a bachelor's degree in a related discipline or does not have relevant background course work, the applicant must complete prerequisite courses as specified by the faculty of the department.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- Official transcripts
- GRE scores
- TOEFL scores 3 letters of recommendation via the online application
- Personal statement and vitae via online application per departmental requirements

## EdSp in Educational and Counseling Psychology

### Admission Contact Information

LaToya Luther (lutherl@missouri.edu)  
 14 Hill Hall; Columbia, MO 65211  
 573-882-7732

### Admission Criteria

- Minimum GPA: 3.0
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
92	580

- Recommended GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 1000 2011		4.0



On or After August 1, 2011	300	4.0
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- All required Graduate School documents
- Official transcripts
- GRE scores
- TOEFL scores
- 3 letters of recommendation via the online application
- Personal statement and vitae via online application per departmental requirements

Recommended Analytic Writing score = 4

## Application Deadlines

- Fall deadline: December 1st for all programs except Educational Psychology, which is January 15th
- M Ed/MA in Health Education & Promotion - rolling deadline
- Career & Sport Psychology- rolling deadline
- M Ed, EdSp track in Mental Health Practices in Schools (online degrees) - rolling deadline Deadlines

**Note:** If an applicant is admitted but does not hold a bachelor's degree in a related discipline or does not have relevant background course work, the applicant must complete prerequisite courses as specified by the faculty of the department.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents
- Official transcripts
- GRE scores
- TOEFL scores 3 letters of recommendation via the online application
- Personal statement and vitae via online application per departmental requirements

## PhD in Educational and Counseling Psychology

### Admission Contact Information

LaToya Luther (lutherl@missouri.edu)  
 14 Hill Hall  
 Columbia, MO 65211  
 573-882-7732

### Admission Criteria

- Fall deadline: December 1st for all programs except Educational Psychology, which is January 15th
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
92	580

- Recommended GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1200	4.5
On or After August 1, 2011	305	4.5

## Required Application Materials

To the Graduate School:

## Educational Leadership & Policy Analysis

ELPA - A place where educational leadership and policy analysis are integrated and influence each other.

Consider ELPA if you:

- Want to improve your organizational leadership skills and knowledge in elementary, secondary, or postsecondary settings
- Are interested in principal or superintendent certification
- Want to work in student affairs or higher education administration
- Want to become a scholar or researcher in higher education
- Desire to shape policy through legislative or research activity

Department of Educational Leadership and Policy Analysis

202 Hill Hall

Columbia, MO 65211

phone: 573-882-8221

fax: 573-884-5714

email: [elpagrad@missouri.edu](mailto:elpagrad@missouri.edu)

website: <http://elpa.missouri.edu>

### Faculty

**Professor** S. W. Graham\*\*, R. Worthington\*

**Associate Professor** N. Arnold\*\*, B. Curs\*\*, J. Hart\*\*, J. Simmons\*\*

**Assistant Professor** E. Crawford\*, R. Darolia\*, S. Diem\*\*, L. Dorner, T. Douglas\*, C. Harper\*\*, P. Mendoza, J. Sebastian\*\*

**Assistant Teaching Professor** J. Fellabaum\*, C. Maher\*, K. Smalley, L. Wilcox\*

**Associate Teaching Professor** G. Malfatti-Rachell\*

**Associate Clinical Professor** B. Naughton\*

**Adjunct Associate Professor** K. Hoffman\*, J. Middleton\*, V. Pittman\*\*

**Adjunct Assistant Professor** T. Barnes\*, M. Beglau, A. Behrens, C. Belcher, L. Blockus\*, W. Brown, D. Burns-Wallace, J. Comerford, P. Conway\*, P. Corum\*, C. Cozette, V. Curby\*, M. Doss, M. Ehlert\*, M. Eimers\*, S. Gauzy\*, S. Han, A. Hull, R. Key\* P. Kinder\*, A. Korschgen, M. Laffey\*, D. Lowry, M. Miles, H. Mosley Linhardt\*, S. Lyon\*, I. Mette\*, L. Nieuwenhuizen\*, S. Preis, K. Presko, C. Scroggs\*, B. Solomon\*, B. Tankersley-Bankhead, J. Hermsen Wood\*, J. Zeilenga\*

**Professor Emeritus** R. L. Andrews\*, I. Cockriel\*, J. F. Donaldson\*\*, J. W. Valentine\*\*

**Associate Professor Emerita** K. Cockrell\*, P. Placier\*\*

**Clinical Associate Professor Emeritus** D. Cockrell\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in educational leadership and policy analysis, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Education, and in the other Schools and Colleges that make

up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

202 Hill Hall

573-882-8221

573-884-5714 (fax)

<http://elpa.missouri.edu>

**Director of Graduate Studies:** Brad Curs

- MA in Educational Leadership and Policy Analysis (p. 355)
- MEd in Educational Leadership and Policy Analysis (p. 355)
- EdSp in Educational Leadership and Policy Analysis (p. 356)
- EdD in Educational Leadership (p. 356)
- PhD in Educational Leadership and Policy Analysis (p. 357)

### About ELPA's Graduate Programs

The graduate programs in the Department of Educational Leadership and Policy Analysis are designed to meet the specific educational needs of the student in a particular area of emphasis. Graduates find employment in a wide range of settings including colleges and universities, public schools, policy agencies, professional associations, government and business and industry.

**The PhD Program in ELPA** requires a minimum of 60 hours beyond the master's degree. The goal of the PhD program is the preparation of professional researchers and scholars who have high levels of competence in conducting research that adds to the knowledge base.

The program also has a goal of meeting the student's individual career goals and interests through the development of an appropriate plan of study. Each emphasis area has slightly different requirements and areas of focus; however, all 3 emphasis areas require a department-wide core; emphasis area coursework; electives; a research core; and the completion of a minimum of 6 hours for the dissertation.

**The Statewide Cooperative EdD Program** in Educational Leadership is designed to enhance the knowledge and competencies of educational leaders so they provide optimal leadership in organizations that educate a wide range of learners from youth to adult. The program's curriculum is designed to prepare leaders who are inquiring, reflective practitioners who are competent in defining and solving complex problems in education.

The **Educational Specialist (EdSp) Program** is designed to enhance the knowledge and competencies of K-12 educational administrators and to lead to advanced principal certification and/or superintendent certification. The program has a thematic, integrated, problem-based curriculum intended to prepare school and district leaders who are inquiring, reflective practitioners. The curriculum is aligned with state standards for certification.

The department's **master's programs** are intended to provide initial preparation for leaders in a variety of educational contexts, including higher education and PK-12 schools. Programs vary according to emphasis area and are designed to meet student's individual career goals and interests — e.g., student affairs administration, initial principal certification and general higher education administration.

A minimum of 33 credit hours is required for the M Ed or MA in Higher Education and a minimum of 30 hours is required for the M Ed in Educational Leadership

**Note:** Per ELPA policy, students have 5 years to complete their MA or M Ed degree.

## Graduate degrees are available in the following emphasis areas:

- MA in Educational Leadership and Policy Analysis with an emphasis in Higher Education
- MEd in Educational Leadership and Policy Analysis with an emphasis in Higher Education
- MEd in Educational Leadership and Policy Analysis with an emphasis in Educational Leadership
- EdSp in Educational Leadership and Policy Analysis with an emphasis in Educational Administration
- EdD in Educational Leadership
- PhD Educational Leadership and Policy Analysis with an emphasis in Educational Administration
- PhD Educational Leadership and Policy Analysis with an emphasis in Educational Policy Studies (PK-12 or Higher Education)
- PhD Educational Leadership and Policy Analysis with an emphasis in Higher Education

## Graduate Certificates

- Education Policy Studies
- Higher and Continuing Education Administration

## Satisfactory Rate of Progress

All ELPA students are expected to make satisfactory progress toward their degrees. Satisfactory progress of students will be determined through an annual review by the director of graduate studies, graduate students' academic advisers and their committees. Judgments about satisfactory progress will involve consideration of the following:

- University-wide time limits for degree completion
- GPA for departmental courses
- Continuous enrollment and active engagement in course work or research (EdD and PhD)
- Student performance in research credits
- Timely resolution of incomplete grades

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Graduate

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## MA in Educational Leadership and Policy Analysis

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### Admission Contact Information

College of Education

202 Hill Hall

573-882-8221 573-884-5714 (fax)

ELPA website: <http://education.missouri.edu/ELPA/index.php>

## Admission Criteria for the MA

- Minimum GPA: 3.0 (A=4.0)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum Academic IELTS score:

Item	Score
OVERALL Score	5.5

## Application Information for the MA

Fall deadline – January 15

Spring deadline – September 15

**Note:** Admissions screening and decisions for all graduate programs are not made until all required materials have been submitted. Admissions recommendations are based on a profile developed from data that include undergraduate (last 60 hours) and graduate grade point averages, recommendations and evidence of successful related experiences.

Required Application Materials to the Graduate School:

- Official copies of transcripts
- Official TOEFL or IELTS scores (international applicants only)
- 3 recommendations, two of which are from faculty who have taught/ advised the applicant (for emphasis in Higher Education applicants only)
- Departmental application
- Current resume

Required Application Materials to the Program:

- Departmental assistantship application, if interested (student affairs assistantship application processes are separate; contact the department for more information).

## Degree Completion Requirements

- Per ELPA policy, a student has five years to complete the MA degree.
- A minimum of 33 credit hours and a thesis are required for the MA in Higher Education.

## MEd in Educational Leadership and Policy Analysis

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### Admission Contact Information

College of Education

202 Hill Hall

573-882-8221 573-884-5714 (fax)

ELPA website: <http://education.missouri.edu/ELPA/index.php>

### Admission Criteria for the MEd

No admission deadline

- Minimum GPA: 3.0 (A=4.0)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum Academic IELTS scores:

Item	Score
OVERALL	5.5

## Application Information for the MEd

Fall deadline – January 15  
Spring deadline – September 15

**Note:** Admissions screening and decisions for all graduate programs are not made until all required materials have been submitted. Admissions recommendations are based on a profile developed from data that include undergraduate (last 60 hours) and graduate grade point averages, recommendations and evidence of successful related experiences.

Required Application Materials to the Graduate School:

- Official copies of transcripts
- Official TOEFL or IELTS scores (international applicants only)
- 3 recommendations, two of which are from faculty who have taught/ advised the applicant (for emphasis in Higher Education applicants only)
- Departmental application
- Current resume

Required Application Materials to the Program:

- Departmental assistantship application, if interested (student affairs assistantship application processes are separate; contact the department for more information).

## Degree Completion Requirements

- Per ELPA policy, a student has five years to complete the MEd degree.
- A minimum of 33 credit hours and a capstone project are required for the MEd with an emphasis in Higher Education.
- A minimum of 30 hours is required for the MEd with an emphasis in Educational Leadership.

## EdSp in Educational Leadership and Policy Analysis

### Admission Contact Information

Educational Leadership & Policy Analysis  
College of Education  
202 Hill Hall  
573-882-8221  
573-884-5714 (fax)  
<http://education.missouri.edu/ELPA/index.php>

### Admission Criteria

- Minimum GPA: 3.0 (A=4.0)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum Academic IELTS scores:

Item	Score
Listening	
Reading	
Writing	
Speaking	
OVERALL Score	5.5

## Application Information for the EdS Degree

No deadline.

**Note:** Admissions screening and decisions for all graduate programs are not made until all required materials have been submitted. Admissions recommendations are based on a profile developed from data that include undergraduate (last 60 hours) and graduate grade point averages, recommendations and evidence of successful professional experiences.

Required Application Materials to the Graduate School:

- Official copies of transcripts
- Official TOEFL or IELTS scores (international applicants only)
- 3 recommendations
- Departmental application
- Current resume

Required Application Materials to the Program

- Assistantship application, if interested

## EdD in Educational Leadership

This educational doctorate program is known as **The Statewide Cooperative EdD Program**.

The EdD program requires a minimum of 76 credit hours beyond the baccalaureate degree. The program, offered in a cohort format, includes 34 hours of course work in 6 contiguous semesters, beginning in the summer and concluding in the spring semester 2 years later. In addition to course work credit, 12 credit hours of dissertation research are required.

### Admission Contact Information

Educational Leadership & Policy Analysis  
202 Hill Hall  
573-882-8221  
573-884-5714 (fax)  
<http://edd.missouri.edu/>

### Admission Criteria

- Competitive GRE score
- Minimum GPA: 3.0 (A=4.0)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum **Academic IELTS** scores:

Item	Score
Listening	
Reading	
Writing	
Speaking	
OVERALL Score	5.5

## EdD Application Information

This cohort program accepts applicants only during even-numbered years. The deadline is December 1.

**Note:** Admissions screening and decisions for all graduate programs are not made until all required materials have been submitted. Admissions recommendations are based on a profile developed from data that include undergraduate (last 60 hours) and graduate grade point averages, scores on the Graduate Record Examinations (GRE), recommendations and evidence of successful professional experiences.

### Required Application Materials to the Graduate School:

- All required Graduate School documents

### Required Application Materials to the Program

- Official copies of transcripts
- Official GRE scores
- Official TOEFL or IELTS scores (international applicants only)
- 3 departmental recommendation forms, two of which are from faculty who have taught/advised the applicant.
- Departmental application
- Current resume

## PhD in Educational Leadership and Policy Analysis

### Admission Contact Information

Educational Leadership & Policy Analysis  
 College of Education, 202 Hill Hall  
 573-882-8221 573-884-5714 (fax)  
<http://education.missouri.edu/ELPA/index.php>

The PhD Program in ELPA requires a minimum of 60 hours beyond the master's degree. The goal of the PhD program is the preparation of professional researchers and scholars who have high levels of competence in conducting research that adds to the knowledge base.

### Admission Criteria

- \* Competitive GRE score
- \* Minimum GPA: 3.0 (A=4.0)

- Minimum **TOEFL** scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum **Academic IELTS** scores:

Item	Score
Listening	
Reading	

### Writing

Speaking	Score
OVERALL Score	5.5

## PhD Application Information

Fall deadline – January 15

Spring deadline – September 15

**Note:** Admissions screening and decisions for all graduate programs are not made until all required materials have been submitted. Admissions recommendations are based on a profile developed from data that include undergraduate (last 60 hours) and graduate grade point averages, scores on the Graduate Record Examinations (GRE), recommendations, evidence of successful professional experiences and samples of scholarly writing.

### Required Application Materials to the Graduate School:

- Official copies of transcripts
- Official GRE scores
- Official TOEFL or IELTS scores (international applicants only)
- 3 recommendations, two of which are from faculty who have taught/ advised the applicant
- Departmental application
- Current resume
- Samples of scholarly writing

### Required Application Materials to the Program

- Assistantship application, if interested

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## Educational Studies

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Dr. Wendy Sims, Director of Teacher Education  
Department of Learning, Teaching and Curriculum  
202 Townsend Hall  
573-882-0560  
TeacherEducation@missouri.edu

Professional education coursework is delivered by four departments within the College of Education, namely, Learning, Teaching and Curriculum; Special Education; Educational Leadership and Policy Analysis; and Educational, School and Counseling Psychology.

### Faculty

**Professor** E.A. Baker\*\*, L. H. Barrow#, J. Baumann\*\*, B. Dougherty\*\*, R. F. Fox\*\*, A. Hoard\*, S. Palonsky\*\*, B. B. Reys\*\*, R. E. Reys\*\*, R. D. Robinson\*\*, T. Sadler\*\*, W. Sims\*\*

**Associate** L. Bennett\*\*, K. B. Chval\*\*, P. J. Friedrichsen\*\*, C. Gilles\*\*, D. L. Hanuscin\*\*, N. Knipping\*, J. Lannin\*\*, J. E. Tarr\*\*, K. Unrath\*\*

**Associate Professor Emeritus** M. Volkmann\*\*

**Assistant Professor** T. Castro\*\*, Z. de Araujo, M. Klosterman\*, C. Kuby\*\*, A. Lannin\*\*, M. Major\*, S. Otten, R. Pinnow\*, L. Sanchez\*\*, M. Siegel\*\*, B. Silvey\*\*

**Emeritus Research Professor** D. A. Grouws\*\*

**Associate Teaching Professor** A. Barbis\*, L. Kingsley\*, J. Ostrow\*

**Assistant Teaching Professor** A. Ashcraft\*, J. Clifton\*, L. Neier\*, J. Ostrow\*, B. Smith\*

**Assistant Clinical Professor** A. Waldron\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 358)
- BES in Educational Studies (p. 358)
  - with emphasis in Interdepartmental (p. 358)

### Graduate

For graduate degree programs related to educational studies, please see the Department of Educational Leadership and Policy Analysis (p. 354) or other College of Education (p. 344) programs. You might also browse the complete list of degree options (p. 5) at the University of Missouri.

### Courses

Courses on Educational Studies can be found within the subject area of Learning, Teaching and Curriculum (LTC).

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## Undergraduate

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## Department Level Requirements - Educational Studies

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The Bachelor in Educational Studies (BES) does not contain any departmental requirements.

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## BES in Educational Studies

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### Major Program Requirements – Educational Studies (BES)

The BES degree may be selected by students desiring to work in a field related to education; however, this degree does not lead to teacher certification. This degree has the option of being completed on campus or online. Students interested in the BES degree may complete an individualized major course of study developed with an advisor from Advising and Certification Services.

In addition to University requirements, such as University general education (p. 18) and graduation requirements, students must complete the following degree requirements.

- World/international: All majors must complete a course that reflects the study of world/international topics (courses may also be used as part of the University general education requirements).
- Multicultural studies: Students address this requirement by demonstrating competence on multicultural studies course.
- A minimum of 24 - 32 credits in the study of the field of education
- A minimum of 24 - 32 credits in a concentration option unique to other majors available at MU

The Bachelor of Educational Studies (BES) degree prepares students for education-related careers. The College of Education will not recommend certification to teach in the public schools on the basis of the BES degree.

### Semester Plan

A sample plan of study for the major is individualized and designed in collaboration with an academic advisor. Students should contact Advising and Certification Services for assistance with academic planning.

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## BES in Educational Studies with Emphasis in Interdepartmental

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### Major Program Requirements

Please see the BES in Educational Studies (p. 358) for program requirements.

### Semester Plan

Refer to the semester plan for the BES in Educational Studies (p. 358).

## Elementary Education

Dr. Wendy Sims, Director of Teacher Education  
 Department of Learning, Teaching and Curriculum  
 202 Townsend Hall  
 573-882-0560  
 TeacherEducation@missouri.edu

Professional education coursework is delivered by four departments within the College of Education, namely, Learning, Teaching and Curriculum; Special Education; Educational Leadership and Policy Analysis; and Educational, School and Counseling Psychology.

### Faculty

**Professor** E.A. Baker\*\*, L. H. Barrow\*\*, J. Baumann\*\*, B. Dougherty\*\*, R. F. Fox\*\*, A. Hoard\*, S. Palonsky\*\*, B. B. Reys\*\*, R. E. Reys\*\*, R. D. Robinson\*\*, T. Sadler\*\*, W. Sims\*\*

**Associate Professor** L. Bennett#, K. B. Chval\*\*, P. J. Friedrichsen\*\*, C. Gilles\*\*, D. L. Hanuscin\*\*, N. Knipping\*, J. Lannin\*\*, J. E. Tarr\*\*, K. Unrath\*\*

**Associate Professor Emeritus** M. Volkmann#

**Assistant Professor** T. Castro\*\*, Z. de Araujo, M. Klosterman\*, C. Kuby\*\*, A. Lannin\*\*, M. Major\*, S. Otten, R. Pinnow\*, L. Sanchez\*\*, M. Siegel\*\*, B. Silvey\*\*

**Emeritus Research Professor** D. A. Grouws\*\*

**Associate Teaching Professor** A. Barbis\*, L. Kingsley\*, J. Ostrow\*

**Assistant Teaching Professor** A. Ashcraft\*, J. Clifton\*, L. Neier\*, B. Smith\*

**Assistant Clinical Professor** A. Waldron\*\*

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 359)
- BSEd in Elementary Education (p. 359)
  - with emphasis in Elementary Education (p. 359)

The requirements for the Bachelor of Science in Education are specified in three areas: University general education, professional education and a teaching major. All students preparing to be teachers in early childhood, elementary, special education, middle or secondary schools, regardless of the major field, are required to complete the University general education program. Students transferring from other institutions are required to fulfill the equivalencies of these courses.

### Graduate

The Elementary Education Program at the University of Missouri includes degree programs that focus on preparing graduates to teach in grades 1-6. We currently offer a Master's, Educational Specialist, and Doctoral (PhD or EdD) in Learning, Teaching and Curriculum with an emphasis in

Elementary Education. You can find out more about these programs at <http://education.missouri.edu/LTC/elementary/index.php>.

You might also browse the complete list of degree options (p. 5) at the University of Missouri.

### Courses

Courses on Elementary Education can be found within the subject area of Learning, Teaching and Curriculum (LTC).

## Undergraduate

### Department Level Requirements - Elementary Education

The BSEd in Early Elementary Education does not contain any departmental requirements.

### BSEd in Elementary Education

#### Major Program Requirements

Students are required to select the emphasis area in Elementary Education for this degree. Refer to the emphasis area (<https://nextcatalog.missouri.edu/undergraduategraduate/collegeofeducation/elementaryeducation/bsed-elementary-education-emphasis-elementary-education>) for degree requirements.

#### Semester Plan

For a sample plan of study refer to the semester plan designed for the emphasis in Elementary Education (p. 359).

### BSEd in Elementary Education with Emphasis in Elementary Education

#### Major Program Requirements

Students must complete all university (p. 17), general education (p. 17), and content requirements, in addition to the degree requirements below.

Professional Education		65
Phase I		
LTC 1100	Orientation	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
Phase II		
LTC 4221	Essential Literacy: Writing	2
LTC 4240	Art for Children	2
LTC 4250	Music for Children	2
LTC 4260	Elementary Social Studies	3
LTC 4194	Elementary Education Field Experience I	3

LTC 4300	Learning and Teaching Number and Operation in the Elementary School	3
SPC_ED 4020	Inquiry into Learning II	3
LTC 4030	Methods in Coordinated School Health	2
LTC 4211	Essential Literacy: Reading	3
LTC 4280	Teaching Science in Elementary Schools	3
LTC 4294	Elementary Education Field Experience II	3
LTC 4310	Learning and Teaching Geometry in the Elementary School	3

### Phase III

ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4231	Advanced Applications of Literacy	3
LTC 4241	Inquiry into Literacy Applications	3
LTC 4971	Internship and Capstone Seminar	3
LTC 4971	Internship and Capstone Seminar	12

Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	12
LTC 4231	3		
LTC 4241	3		
LTC 4971	3		
	<b>12</b>		<b>12</b>
Total Credits: 120			

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1100	1	ENGLSH 1000	3
MATH 1100	3	BIO_SC 1010	3
HIST 1100	3	BIO_SC 1020	2
PSYCH 1000	3	STAT 1200	3
COMMUN 1200	3	POL_SC 1100	3
Possible Elective	3	LTC 1200	2
	<b>16</b>		<b>16</b>
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
PHYSICS 2330	4	Writing Intensive	3
GEOG 1100	3	ECONOM 1014	3
MUSIC_NM 1618 (or Art)	2	English Literature	3
MO State Certification Concentration Course	3	MO State Certification Concentration Course	3
	<b>16</b>		<b>16</b>
Third Year			
Fall	Credits	Spring	Credits
LTC 4194	3	LTC 4030	2
LTC 4221	2	LTC 4211	3
LTC 4240	2	LTC 4280	3
LTC 4250	2	LTC 4294	3
LTC 4260	3	LTC 4310	3
LTC 4300	3	SPC_ED 4020	3
	<b>15</b>		<b>17</b>



## Information Science and Learning Technology

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School of Information Science & Learning Technologies  
303 Townsend Hall  
Columbia, MO 65211  
phone: 877-747-5868  
phone: 573-882-4546  
fax: 573-884-0122  
email: [sislt@missouri.edu](mailto:sislt@missouri.edu)  
website: <http://education.missouri.edu/SISLT/index.php>

### Faculty

**Professor** J. M. Budd\*\*, S. Erdelez\*\*, G. Fitzgerald\*\*, J. Laffey\*\*, R. Marra\*\*

**Associate Professor** D. Adkins\*\*, J. Caplow\*, T. R. Kochtanek\*\*, J. Moore\*\*

**Assistant Professor** J. Bossaller\*\*, T. Gibson\*, H. Moulaison\*\*

**Associate Teaching Professor** J. Howland\*, A. Klimczak\*

**Assistant Teaching Professor** C. LeBeau\*, K. Robinson\*

**Professors Emeriti** J. Wedman, M. Sievert

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in information science and learning technologies, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Education, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

Student Services Coordinator, 304 Townsend Hall  
Columbia, MO 65211  
573-882-4546 or toll free 877-747-5868  
<http://education.missouri.edu/SISLT/>

**Director of Graduate Studies:** Julie Caplow

- MA in Information Science and Learning Technology, (p. 361) *emphasis in Library Science*
- MEd in Information Science and Learning Technology, (p. 363) *emphasis in Educational Technology*
- EdSp in Information Science and Learning Technology, (p. 363) *emphasis in Educational Technology*
- PhD in Information Science and Learning Technology (p. 364)

**Note:** The MEd and EdSp in Educational Technology as well as the Online Educator Graduate Certificate are available via Mizzou Online: <http://online.missouri.edu/>

## About Information Science & Learning Technologies

In January 1997, the School of Information Science & Learning Technologies became the home for MU's graduate programs in Library and Information Science and Educational Technology as well as a new, interdisciplinary doctoral program in Information Science & Learning Technologies.

SISLT faculty are internationally renowned for their research and development accomplishments. Faculty and students are committed to a collaborative, interdisciplinary approach – both within MU and among other research-extensive universities. Nowhere is this more evident than in the Allen Institute (<http://alleninstitute.missouri.edu>), a 10,000 square foot facility dedicated to supporting collaborative R&D at the intersection of Information & Learning.

### Graduate

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## MA in Information Science and Learning Technology with emphasis in Library Science

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Admission Contact Information

Email: [sislt@missouri.edu](mailto:sislt@missouri.edu)

SISLT Student Services Coordinator

304 Townsend Hall

Columbia, MO 65211

Phone: 573-882-4546 or toll free 877-747-5868

<http://lis.missouri.edu/>

## About the Library & Information Science MA Program

The program is accredited by the American Library Association. The mission of the Library Science (LS) program is to contribute to the essential knowledge, skills, and values of librarianship, instill these in our students.

Goals:

1. Design and implement a curriculum that incorporates ALA's Core Competences into a thorough generalist program.
2. Develop pedagogical methods—individually and collaboratively—that use effective techniques to enhance student learning.
3. Expand the knowledge base of the field through innovative research and scholarship and share the results to the broadest professional and disciplinary communities.
4. Engage professionals and organizations in Missouri, the nation, and the world, sharing the knowledge and talents of the faculty to contribute to the development of the field.
5. Create a global awareness of the program's excellence through the integration of teaching, research, and service.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding

packages. Check the program Web site or ask the program contact for details.

## Admission Criteria

Please Note: Application deadlines are strictly adhered to and no applicant is considered for admission until all required application materials are received.

Fall deadline: April 1  
Spring deadline: October 1

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	550	550	4.0
On or After August 1, 2011	156	146	4.0

Minimum GPA: 3.0 in the last 60 hours of the undergraduate degree

## Required Application Materials

*To the Graduate School:*

All required Graduate School documents, including the online graduate application and bachelor's transcripts.

*To the Library Science MA program*

- Statement of Purpose: Briefly describe (in 500 words or less) your immediate educational and career goals. Please respond to the following questions:
  1. Why do you want to earn a master's degree in Library and Information Science?
  2. What areas of Library and Information Science interest you?
  3. Do you anticipate working in a particular type of library or information agency?

Note: Statement can be uploaded into Graduate School's online application system.

- Curriculum vitae or resume
- 2 letters of reference
- GRE scores

## Library Science MA Plan of Study

Our program is the only Master's Degree in the state of Missouri to be fully accredited by the American Library Association. Upon successful completion of the 42-hour program of study, you will receive a Master of Arts in Information Science & Learning Technologies with an Emphasis in Library Science. The LIS curriculum reflects the foundations of the field as well as the critical issues facing the profession. Most LIS faculty are based in Columbia, with clinical faculty in St. Louis and Kansas City. Partnerships with Missouri State University and the University of Nebraska-Omaha allow us to provide classes in those locations as well. Students seeking certification as a school librarian/media specialist need to meet the certification requirements in place at the time of graduation.

## Remaining in Good Standing

The courses used in the program for the master's degree must be no older than 8 years at the time of graduation.

## Probation

Any one of the following is cause for an LIS student being placed on academic probation for the remainder of the student's graduate program:

- a student's cumulative GPA falls below 3.0;
- a student receives one or more letter grades of C or F in a semester.

An LIS student who earns a letter grade of F in a core course must repeat the course and earn a letter grade of B or higher.

When an LIS student is placed on academic probation, the student and the student's advisor will be notified. It is the student's responsibility to contact and schedule a conference with the academic advisor to develop a plan to remedy the situation. The student and the advisor will jointly sign a document enumerating the specific steps to be accomplished during the subsequent semester.

## Dismissal

Any one of the following is cause for dismissal from the LIS Program:

- a student's GPA falls below the required 3.0 for a second semester in the student's graduate LIS program;
- a student earns a letter grade of C or F in one or more courses in a semester, then earns a letter grade of C or F in one or more courses in a subsequent semester.

The dismissal letter will inform the student of the right to appeal, first, to the LIS Program and, second, to the Graduate Faculty Senate. A copy of the dismissal letter will be sent to the Graduate Dean and the student's advisor at the same time it is sent to the student.

LIS students must also demonstrate continuous enrollment in courses related to the degree following admission to remain on active status.

- Admitted students who have not enrolled for two consecutive semesters (fall-spring/spring-fall) will be notified of the pending change from active to inactive status and given an opportunity to enroll in courses the semester following the notification (March 15 for fall semester; October 15 for spring semester).
- Students who do not enroll in the semester following notification will be moved to inactive status and removed from the list of current LIS graduate students.
- Students moved to inactive status must reapply to the program and meet the admission requirements published on the SISLT Web site at the time the inactive student reapplies.

## Library Science MA Comprehensive Examination

Every library science MA student must complete a written comprehensive examination. The examination structure will include 4 general areas of concentration:

- Issues in Library and Information Science
- Information Technology
- Management of Information Services
- Library and Information Services

# MEd in Information Science and Learning Technology with emphasis in Educational Technology

## Admission Contact Information

Email: [sislt@missouri.edu](mailto:sislt@missouri.edu)  
 SISLT Student Services Coordinator  
 304 Townsend Hall  
 Columbia, MO 65211  
 Phone: 573-882-4546 or toll free 877-747-5868  
<http://EdTech.missouri.edu>

## About the Educational Technology MEd

The Educational Technology emphasis area is your portal to excellence and leadership in designing, developing, and implementing technology in education, training and performance support.

Three focus areas are available for your degree. Students who focus on Learning Systems Design & Development learn to plan and create the learning and performance support resources used by individuals, groups, and organizations. Students who focus on Technology in Schools learn the strategies and processes for advancing the use of new technologies in schools, colleges, and other learning environments, (e.g., virtual schools; online courses). Students who focus on the Online Educator learn to design, implement, and evaluate effective online learning experiences in a variety of settings.

Working with a faculty advisor, each student develops a customized program of study. You pick the professional goal that makes sense to you, and our faculty will help you transform your goal into reality.

## Admission Criteria

Deadline for Fall entrance: May 1  
 Deadline for Spring entrance: October 1  
 Deadline for Summer entrance: March 1

- Undergraduate GPA of at least 3.0 in the last 60 credit hours of the degree
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	500	500	3.5
On or After August 1, 2011	156	146	4.0

**Note:** If your credentials are lacking one of these characteristics, you could possibly be admitted on probation status. If this happens, you must maintain a minimum GPA of 3.0 during your first 12 hours of graduate coursework, with no grade lower than a "B".

## Required Application Materials

To the Graduate School:

- All required Graduate School documents, including the online graduate application and bachelor's transcripts

To the Educational Technology Program

- Statement of Purpose (can also be uploaded into Graduate School online application)
- Curriculum Vitae or Resume
- 2 letters of reference
- GRE scores For the GRE, use institution code "6875 U Missouri Columbia" and department code "3903 Educational Media"
- Any supporting materials

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Plan of Study

The MEd consists of 30 graduate credit hours. The Educational Technology curriculum allows you to customize your course work by focusing on technology design and development or technology implementation.

## Careers

Your degree in Educational Technology will open an array of career options. Some graduates work in K-12 schools, others work in corporations, and still others apply their skills in government, healthcare, higher education, and other settings. For example, some of our recent graduates are Software Designers and Developers, Learning Strategy Managers, Adaptive Technology Specialists, Training Designers, School Technology Coordinators, and Online Instructors. Whatever the setting, you will graduate with a skill set that will serve you well in the future.

# EdSp in Information Science and Learning Technology with emphasis in Educational Technology

## Admission Contact Information

Email: [sislt@missouri.edu](mailto:sislt@missouri.edu)  
 SISLT Student Services Coordinator  
 304 Townsend Hall  
 Columbia, MO 65211  
 Phone: 573-882-4546 or toll free 877-747-5868  
<http://EdTech.missouri.edu>

## About the Educational Technology EdSp Program

The Educational Technology Specialist degree at MU is your portal to excellence and leadership in designing, developing, and implementing technology in education, training and performance support.

Three focus areas are available for your degree. Students who focus on Learning Systems Design and Development learn to plan and create the learning and performance support resources used by individuals, groups, and organizations. Students who focus on Technology in Schools learn

the strategies and processes for advancing the use of new technologies in schools, colleges, and other learning environments, (e.g., virtual schools; online courses). Students who focus on the Online Educator learn to design, implement, and evaluate effective online learning experiences in a variety of settings.

Working with a faculty advisor, each student develops a customized program of study. You pick the professional goal that makes sense to you, and our faculty will help you transform your goal into reality.

## Admission Criteria

- Deadline for Fall entrance: May 1
- Deadline for Spring entrance: October 1
- Deadline for Summer entrance: March 1

- Undergraduate GPA of at least 3.0 in the last 60 credit hours of the degree
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	500	500	3.5
On or After August 1, 2011	156	146	4.0

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents, including the online graduate application and bachelor's transcripts

*To the Educational Technology Program*

- Statement of Purpose (can also be uploaded into Graduate School online application)
- Curriculum Vitae or Resume
- 2 letters of reference
- GRE scores
- Any supporting materials

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Plan of Study

The EdSp is a 30 credit hour option is available for students who already have a master's degree. The Educational Technology curriculum allows you to customize your course work by focusing on technology design and development or technology implementation.

## Careers

Your degree in Educational Technology will open an array of career options. Some graduates work in K-12 schools, others work in corporations, and still others apply their skills in government, healthcare,

higher education, and other settings. For example, some of our recent graduates are Software Designers and Developers, Learning Strategy Managers, Adaptive Technology Specialists, Training Designers, School Technology Coordinators, and Online Instructors. Whatever the setting, you will graduate with a skill set that will serve you well in the future.

## PhD in Information Science and Learning Technology

### Admission Contact Information

Email: [sisl@missouri.edu](mailto:sisl@missouri.edu)  
 SISLT Student Services Coordinator  
 304 Townsend Hall  
 Columbia, MO 65211  
 Phone: 573-882-4546 or toll free 877-747-5868

### Admission Criteria

- Deadline for Fall entrance: February 15
- Deadline for Spring entrance: September 15

- Undergraduate GPA of at least 3.0 in the last 60 credit hours of the degree
- Graduate GPA of 3.5
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	500	500	3.5
On or After August 1, 2011	153	144	3.5

In addition to meeting admission requirements, all students applying to the PhD program must complete faculty interviews and documentation of their research, development interests and capabilities. If you do not meet these standards, you should provide evidence of exceptionalism in one or more other categories.

## Required Application Materials

*To the Graduate School:*

All required Graduate School documents, including the online graduate application and bachelor's transcripts.

*To the Information Science & Learning Technologies Program*

- Statement of Purpose (can also be uploaded into Graduate School online application)
- Curriculum vitae or resume
- 3 letters of reference
- GRE scores
- Any supporting materials (i.e. published papers or technical reports)

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding

packages. Check the program Web site or ask the program contact for details.

## About the Program

The PhD program prepares professionals to understand and influence learning, information and performance in diverse settings, especially through the use of interactive technologies. We seek individuals who are committed to conducting research that integrates theory and practice.

You will gain the competencies required to:

- Analyze specific informational organization and retrieval, learning and performance needs and evaluate systems to meet these needs.
- Design, develop and implement technologies and technological interventions to improve information organization and retrieval, learning and performance.
- Conduct systematic research, which contributes to the knowledge base of learning, information organization and retrieval, performance and/or technology.

## Plan of Study

Course work, internships and independent study projects support the achievement of these competencies, and your program centers on producing a portfolio of achievements indicating that the competencies have been attained. While course work supports production of the portfolio, we encourage students to develop products that cut across several courses, resulting in products that are personally satisfying, solve real problems and represent high quality work. We are particularly interested in products developed in collaboration with other students, practicing professionals and others beyond our program and campus.

## Research

The program culminates with a significant research effort that contributes to the knowledge base of learning, information organization and retrieval, performance and/or technology. Whether one major study or a series of smaller studies, the research is designed to position our graduates alongside the leading theorists, researchers and practitioners in the field. There is no minimum number of 9090 research hours.

## Learning, Teaching and Curriculum

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Professionals interested in advancing their careers in education can specialize in a variety of disciplines in MU's Department of Learning, Teaching and Curriculum. LTC specializes in teacher preparation and in graduate programming for professionals in education. Students find challenging, yet rewarding, opportunities through MU's dynamic research centers and projects and are supported by faculty who are subject matter experts.

Consider LTC if you

- want to advance as a professional in education through a field specialization
- enjoy exercising independent judgment, and
- desire to help all learners achieve success and strengthen the future through education.

Contact us:

Dr. John Lannin, Interim Chair LTC

303 Townsend Hall

Columbia, MO 65211

phone: 573-882-8394

fax: 573-884-2917

website: <http://education.missouri.edu/LTC/index.php>

**Chair** J. Lannin

**Chancellor's Chair for Excellence in Literacy Education and**

**Professor** J. Baumann

**Richard G. Miller Professor** B. Dougherty\*\*

**Curators' Professor** R. E. Reys\*\*

**Lois Knowles Distinguished Professor** B. Reys\*\*

**Special Assistant to the Provost:** L. Bennett\*\*

**Director, Office of Science Outreach:** A. Waldron

## Faculty

**Professor** E. Baker\*\*, L. H. Barrow\*\*, J. Baumann\*\*, B. Dougherty\*\*, R. F. Fox\*\*, A. Hoard\*, S. Palonsky\*\*, B. B. Reys\*\*, R. E. Reys\*\*, R. D. Robinson\*\*, T. Sadler\*\*, W. Sims\*\*

**Associate Professor** L. Bennett\*\*, K. Chval\*\*, P. Friedrichsen\*\*, C. Gilles\*\*, D. Hanuscin\*\*, N. Knipping\*, J. Lannin\*\*, M. Siegel\*\*, J. E. Tarr\*\*, K. Unrath\*\*

**Assistant Professor** A. J. Castro\*\*, O. Chavez-Lopez\*\*, C. Kuby\*\*, A. Lannin\*\*, M. Major\*, R. Pinnow\*, S. Otten\*, L. Sanchez\*\*, B. Silvey\*\*, Z. de Araujo\*

**Assistant Teaching Professor** N. Ashcraft\*, T. Barbis\*, J. Clifton, L. Kingsley\*, L. Neier\*, J. Ostrow\*, B. Smith\*

**Research Professor Emeritus:** D. A. Grouws\*\*

**Associate Professor Emeritus:** M. Volkman\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

While MU does not offer undergraduate degrees specifically in learning, teaching and curriculum, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Education, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Graduate

303 Townsend

573-882-6462

573-884-2917 (fax)

<http://education.missouri.edu/LTC/>

**Director of Graduate Studies:** Kathy Unrath

- MA in Learning, Teaching and Curriculum (p. 366) (not accepting applicants)
- MEd in Learning, Teaching and Curriculum (p. 367)
- EdSp in Learning, Teaching and Curriculum (p. 367)
- EdD in Learning, Teaching and Curriculum (p. 368)
- PhD in Learning, Teaching and Curriculum (p. 368)

## About the Program

Graduate study in Learning, Teaching, & Curriculum prepares teachers, curriculum leaders and teacher educators for professional excellence. With the rapid changes in education--especially developments in instructional materials and techniques, curriculum construction and classroom organization--teachers who have completed their certification may need to update, refine and extend their knowledge and skills.

Further, many educators enter new roles as subject-matter specialists, curriculum coordinators, supervisors of instruction, department heads, leaders of professional development education or teacher educators. Graduate programs in Learning, Teaching, & Curriculum are designed to prepare the professionals for these new roles.

## Areas of Study

Depending on the degree program, students can pursue discipline-specific emphasis areas ( e.g., elementary education, music education, science education and others) and focus on curriculum development, research, or teacher education. Outside concentration areas are also available.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Graduate

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## MA in Learning, Teaching and Curriculum

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Our department is no longer admitting students to the MA in Learning, Teaching and Curriculum. We invite you to explore the other graduate

degree options in Learning, Teaching and Curriculum (p. 366) and the College of Education. (p. 348)

## MEd in Learning, Teaching and Curriculum

### Admission Contact Information

Fran Colley  
colleyf@missouri.edu  
303 Townsend Hall  
Columbia, MO 65211  
573-882-6462

### About the M.Ed.

The M. Ed. program requires 32 hours in Learning, Teaching, & Curriculum coursework. The following emphasis areas are currently offered: General LTC; Art Education; Early Childhood Education; Elementary Education; English Education; Foreign Language Education; Learning and Instruction; Mathematics Education; Music Education; Reading Education; Science Education and Social Studies Education.

### Admissions Deadlines

Applicants are encouraged to submit their applications as early in the process as possible. Applications can take 6-8 weeks to expedite completely. Every reasonable effort will be made to process the application for the semester requested.

### Admission Requirements

- Completion of an appropriate baccalaureate degree with a GPA of 3.0 or better
- Evidence of at least 2 years of successful experience in an appropriate field
- Minimum TOEFL scores for most areas:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE score\* required for following emphasis areas only: Early Childhood Education, English Education (including TESOL focus), Mathematics Education, Science Education and Social Studies Education.

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	810+
On or After August 1, 2011	291= (V150,Q141)

\*Clarification: Not all LTC programs require the GRE exam - only those listed above.

### Required Application Materials to the Graduate School

- All required Graduate School documents
- Official transcripts
- GRE scores for Early Childhood Education, English Education (including TESOL focus), Mathematics Education, Science Education and Social Studies Education.
- TOEFL scores (international applicants)

### Required Application Materials to the Learning, Teaching, & Curriculum Program

- Personal data sheet form (select appropriate form from the department website)
- Statement of purpose
- GRE scores (a copy may be sent to the department too; minimum, an official result needs to be sent to Graduate School)
- Letters of recommendation; check with department to see if they are required for your emphasis. Most programs now require a minimum of 2 letters of recommendation. ALL LETTERS MUST BE CONFIDENTIAL AND SUBMITTED ACCORDINGLY THROUGH THE GRADUATE SCHOOL APPLICATION SYSTEM.

## EdSp in Learning, Teaching and Curriculum

### Admission Contact Information

Fran Colley  
colleyf@missouri.edu  
303 Townsend Hall  
Columbia, MO 65211  
573-882-6462

### About the Ed.S.

This post-master Educational Specialist degree is offered with the following emphasis areas: General LTC; Mathematics Education; Music Education; Reading Education or Science Education

### Admissions Deadlines

Applicants are encouraged to submit their applications as early in the process as possible. Applications can take 6-8 weeks to expedite completely. Every reasonable effort will be made to process the application for the semester requested.

### Admission Requirements

- Completion of an appropriate baccalaureate degree with a GPA of 3.0 or better
- Evidence of at least 2 years of successful experience in an appropriate field
- Minimum TOEFL scores for most areas:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

Minimum GRE score is required for all applicants of the Ed.S. program.

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	810+
On or After August 1, 2011	291= (V150,Q141)

### Required Application Materials to the Graduate School:

- All required Graduate School documents
- Official transcripts
- GRE
- TOEFL scores

### Required Application Materials to the Learning, Teaching, & Curriculum Program

- Personal data sheet form (select appropriate form from the department website)

- Statement of purpose
- GRE scores (a copy may be sent to the department too; minimum, an official result needs to be sent to Graduate School)
- 3 letters of recommendation; check with department to see if they are required for your emphasis. ALL LETTERS MUST BE CONFIDENTIAL AND SUBMITTED ACCORDINGLY THROUGH THE GRADUATE SCHOOL APPLICATION SYSTEM.

## EdD in Learning, Teaching and Curriculum

### Admission Contact Information

Fran Colley  
colleyf@missouri.edu  
303 Townsend Hall  
Columbia, MO 65211  
573-882-6462

### About the Ed.D.

The LTC department offers the doctorate of education with emphasis in General LTC studies, Elementary Education, or Reading Education.

### Application Deadline

Applicants are encouraged to submit their applications as early in the process as possible. Applications can take 6-8 weeks to expedite completely. Every reasonable effort will be made to process the application for the semester requested.

### Admission Requirements

- Completion of an appropriate preliminary degree with a GPA of 3.0 or better
- Evidence of at least 2 years of successful experience in an appropriate field
- Minimum TOEFL scores for most areas:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

Minimum GRE score\* (varies by program area). Generally:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	810+
On or After August 1, 2011	291= (V150,Q141)

\*Note: Minimum GRE score varies by program area. All LTC doctoral programs require the GRE exam in order to be considered for the program.

#### Required Application Materials to the Graduate School:

- All required Graduate School documents
- Official transcripts
- Official GRE Scores
- Official TOEFL scores

#### Required Application Materials to the Learning, Teaching, & Curriculum Program

- Personal data sheet form (select appropriate form from the department website)

- Statement of purpose
- GRE scores (a copy may be sent to the department too; minimum, an official result needs to be sent to Graduate School)
- 3 letters of recommendation are required for all doctoral applicants. ALL LETTERS MUST BE CONFIDENTIAL AND SUBMITTED ACCORDINGLY THROUGH THE GRADUATE SCHOOL APPLICATION SYSTEM.

## Financial Aid from the Program

Internal assistantships, fellowships or other funding packages require a departmental application, starting Fall 2010, and must be completed every semester in order to have funding renewed. Completion of the application does not guarantee renewal. Check the program Web site or ask the program contact for details.

## PhD in Learning, Teaching and Curriculum

### Admission Contact Information

Fran Colley colleyf@missouri.edu  
303 Townsend Hall  
Columbia, MO 65211  
573-882-6462

### About the Ph.D.

The LTC department offers the Doctorate of Philosophy (Ph.D.) with emphasis options in General LTC; Art Education; Early Childhood Education; Elementary Education; English Education; Foreign Language Education; Mathematics Education; Music Education; Reading Education; Science Education; or Social Studies Education.

### Application Deadlines

Applicants are encouraged to submit their applications as early in the process as possible. Applications can take 6-8 weeks to expedite completely. Every reasonable effort will be made to process the application for the semester requested.

### Admission Requirements

- Completion of an appropriate preliminary degree with a GPA of 3.0 or better
- Evidence of at least 2 years of successful experience in an appropriate field
- Minimum TOEFL scores for most areas:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE score\* (varies by program area). Generally:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1000+
On or After August 1, 2011	V153,Q144=297+

Note: Minimum GRE score varies by program area. All LTC doctoral programs require the GRE exam in order to be considered for the program.

#### Required Application Materials to the Graduate School:

- All required Graduate School documents



- Official transcripts
- Official GRE scores
- Official TOEFL scores

**Required Application Materials to the Learning, Teaching, & Curriculum Program**

- Personal data sheet form (select appropriate form from the department website)
- Statement of purpose
- GRE scores (a copy may be sent to the department too; minimum, an official result needs to be sent to Graduate School)
- 3 letters of recommendation are required for all doctoral applicants.  
ALL LETTERS MUST BE CONFIDENTIAL AND SUBMITTED  
ACCORDINGLY THROUGH THE GRADUATE SCHOOL  
APPLICATION SYSTEM.

**Financial Aid from the Program**

Internal assistantships, fellowships or other funding packages require a departmental application, starting Fall 2010, and must be completed every semester in order to have funding renewed. Completion of the application does not guarantee renewal. Check the program Web site or ask the program contact for details.

## Middle School Education

Dr. Wendy Sims, Director of Teacher Education  
 Department of Learning, Teaching and Curriculum  
 202 Townsend Hall  
 573-882-0560  
 TeacherEducation@missouri.edu

Professional education coursework is delivered by four departments within the College of Education, namely, Learning, Teaching and Curriculum; Special Education; Educational Leadership and Policy Analysis; and Educational, School and Counseling Psychology.

### Faculty

**Professor** E. A. Baker\*, L. H. Barrow\*\*, J. Baumann#, B. Dougherty\*\*, R. F. Fox\*\*, A. Hoard\*, S. Palonsky\*\*, B. B. Reys\*\*, R. E. Reys\*\*, R. D. Robinson\*\*, T. Sadler\*\*, W. Sims\*\*

**Associate Professor** L. Bennett\*\*, K. B. Chval\*\*, P. J. Friedrichsen\*\*, C. Gilles\*\*, D. L. Hanuscin\*\*, N. Knipping\*, J. Lannin\*\*, J. E. Tarr\*\*, K. Unrath\*\*

**Associate Professor Emeritus** M. Volkmann\*\*

**Assistant Professor** T. Castro\*\*, Z. de Araujo, M. Klosterman\*, C. Kuby\*\*, A. Lannin\*\*, M. Major\*, S. Otten, R. Pinnow\*, L. Sanchez\*\*, M. Siegel\*\*, B. Silvey\*\*

**Emeritus Research Professor** D. A. Grouws\*\*

**Associate Teaching Professor** A. Barbis\*, L. Kingsley\*, J. Ostrow\*

**Assistant Teaching Professor** A. Ashcraft\*, J. Clifton\*, L. Neier\*, B. Smith\*

**Assistant Clinical Professor** A. Waldron\*\*

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 370)
- BSEd in Middle School Education (p. 370)
  - with emphasis in Math (p. 372)
  - with emphasis in Science (p. 374)
  - with emphasis in Social Studies (p. 375)
  - with emphasis in Language Arts (p. 370)

The requirements for the Bachelor of Science in Education are specified in three areas: University general education, professional education and a teaching major. All students preparing to be teachers in early childhood, elementary, special education, middle or secondary schools, regardless of the major field, are required to complete the University general education program. Students transferring from other institutions are required to fulfill the equivalencies of these courses.

### Graduate

The Middle School Education Program at the University of Missouri includes degree programs that focus on preparing graduates to teach in

grades 5-9. The College of Education does not currently offer a graduate degree specifically in Middle School Education. However, we do offer Masters (M.Ed.) and doctorates (Ph.D) in the following areas.

- Math
- English/Language Arts
- Science
- Social Studies
- Art
- Music

We also offer a graduate degree in "Reading/Literacy Education" at the M.Ed., Ed.S., Ed.D, and Ph.D. levels.

You can find out more about the programs by going to [http://education.missouri.edu/academics/graduate\\_studies/index.php](http://education.missouri.edu/academics/graduate_studies/index.php).

### Courses

Courses on Middle School Education can be found within the subject area of Learning, Teaching and Curriculum (LTC).

## Undergraduate

### Department Level Requirements - Middle School Education

The BSEd in Middle School Education does not contain any departmental requirements.

## BSEd in Middle School Education

### Major Program Requirements

The BSEd in Middle School Education is offered in four emphasis areas: Language Arts (p. 370), Math (p. 372), Science (p. 374), and Social Studies (p. 375). Students must choose one of the emphasis areas to earn the BSEd. Details on the requirements for the programs are listed under each emphasis.

### Semester Plan

A sample plan of study has not been designed for this major, as students are required to select an emphasis. Refer to the semester plans designed for the emphasis in Language Arts (p. 370), Math (p. 372), Science (p. 374), or Social Studies (p. 375).

## BSEd in Middle School Education with Emphasis in Language Arts

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Professional Education		44
Phase I		
LTC 1130	Orientation: Middle School Education	1

ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
<b>Phase II</b>		
LTC 4380 & LTC 4384	Teaching Middle School Language Arts I and Teaching Middle School Language Arts I Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4390 & LTC 4394	Teaching Middle and Secondary English/ Language Arts II and Teaching Middle School Language Arts II Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4400 & LTC 4404	Teaching Middle and Secondary English/ Language Arts III and Teaching Middle School Language Arts III Field Experience	4
LTC 4410	Teaching, Engaging and Assessing Middle-Level Students	3
<b>Phase III</b>		
LTC 4971	Internship and Capstone Seminar	14
<b>Content Area</b>		
27		
ENGLISH 2010	Intermediate Composition	3
ENGLISH 2100	Writing About Literature	3
ENGLISH 3310	Survey of American Literature: 1865-Present	3
ENGLISH 4600	Structure of American English	3
ENGLISH 4610	History of the English Language	3
LTC 4460	Teaching English to Speakers of Other Languages	3
English Electives-One course from each area		
19th Century Literature/African-American Literature/Folklore		
3		
ENGLISH 3110 Special Themes in Literature		
ENGLISH 3400 Survey of African American Literature, Beginnings to 1900		
ENGLISH 3410 Survey of African American Literature, 1900- Present		
ENGLISH 4700 Special Themes in Folklore		
20th Century Literature/Literature by and about Women		
3		
ENGLISH 4169 Major Authors, 1890-Present		
ENGLISH 4188 Major Women Writers, 1789-1890		
ENGLISH 4189 Major Women Writers, 1890-Present		
ENGLISH 4210 Medieval Literature		
Writing		
3		
ENGLISH 1510 Creative Writing: Introduction to Fiction		
ENGLISH 1530 Creative Writing: Introduction to Poetry		
ENGLISH 4510 Creative Writing: Advanced Fiction		
ENGLISH 4530 Creative Writing: Advanced Poetry		

## Required Option Area

All middle school education majors are required to select one option area. (Option areas do not appear on transcripts or diplomas.) Please select one of the following:

## Option Area: Art (Grades K-9)

ART_GNRL 1020	Appreciation of Art	3
ART_GNRL 1040	Basic 3-D Design	3
ART_DRAW 1050	Drawing I	3
ART_CERM 2100	Beginning Ceramics	3
ART_FIBR 2300	Beginning Fibers	3
ART_PNT 2500	Beginning Painting	3
ART_PRNT 2700 or ART_PRNT 2730	Beginning Printmaking Serigraphy	3
LTC 4730 & LTC 4734	Overview of Art Education and Overview of Art Education Field Experience	4
LTC 4740 & LTC 4744	Inquiry into Art Education: Pre-School Through Middle School and Inquiry into Art Education: Pre-School Through Middle School Field Experience	4

## Option Area: Math

MATH 1160	Precalculus Mathematics	5
MATH 1300	Finite Mathematics	3
MATH 1360	Geometric Concepts	3
MATH 4060	Connecting Geometry to Middle and Secondary Schools	3
MATH 4070	Connecting Algebra to Middle and Secondary Schools	3
MATH 4080	Calculus Connections	3
STAT 1200	Introductory Statistical Reasoning	3
LTC 4360 & LTC 4364	Intro. Teaching Mathematics in Middle and Secondary Schools and Intro. Teaching Math in Middle and Secondary School Field Experience	4

## Option Area: Science

CHEM 1320	College Chemistry I	4
PHYSCS 2330	Exploring the Principles of Physics	4
GEOL 1100	Principles of Geology with Laboratory	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
BIO_SC 1060	Basic Environmental Studies	3
or NAT_R 1060	Ecology and Conservation of Living Resources	
ASTRON 1010	Introduction to Astronomy	3-4
or ATM_SC 1050	Introductory Meteorology	
LTC 4340 & LTC 4344	Middle School Science I and Middle School Science Field I	4

## Option Area: Social Studies

HIST 1100	Survey of American History to 1865	3
HIST 1200	Survey of American History Since 1865	3
HIST 1500	Foundations of Western Civilization	3
World History Elective		
3		
Geography Elective		
3		
POL_SC 1100	American Government	3

Economics Elective	3
LTC 4320 Middle School Social Studies I & LTC 4324 and Middle School Social Studies Field I	4

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1130	1	MATH 1100	3
ENGLISH 1000	3	GEOL 1100	4
HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	Humanities Elective	3
COMMUN 1200	3	ENGLISH 2010	3
LTC 1200	2		
	15		16
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
BIO_SC 1010	3	STAT 1200	3
Humanities Elective	3	ENGLISH 3310	3
ENGLISH 2100	3	ENGLISH 2400	3
Option Area Content	3	Option Area Content	3
	16		16
Third Year			
Fall	Credits	Spring	Credits
LTC 4380	3	LTC 4390	3
LTC 4384	1	LTC 4394	1
Option Area Methods	3	SPC_ED 4020	3
Option Area Field	1	ENGLISH 4610	3
ENGLISH 4600	3	ENGLISH 1510	3
Option Area Content	3	Option Area Content	3
Option Area Content	3	Option Area Content	3
	17		19
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14
LTC 4400	3		
LTC 4404	1		
LTC 4410	3		
ENGLISH 3180	3		
LTC 4460	3		
	16		14
Total Credits: 129			

## BSEd in Middle School Education with Emphasis in Math

### Major Program Requirements

Students must complete all university, general education, and content requirements, in addition to the degree requirements below.

#### Professional Education 44

##### Phase I

LTC 1130	Orientation: Middle School Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

##### Phase II

LTC 4360 & LTC 4364	Intro. Teaching Mathematics in Middle and Secondary Schools and Intro. Teaching Math in Middle and Secondary School Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4420 & LTC 4424	Adolescent Literacy and Middle School Literacy Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4370 & LTC 4374	Teaching and Modeling Middle School Mathematics and Teaching and Modeling Middle School Mathematics Field Experience	4
LTC 4410	Teaching, Engaging and Assessing Middle-Level Students	3

##### Phase III

LTC 4971	Internship and Capstone Seminar	14
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#### Content Area 29

STAT 1200	Introductory Statistical Reasoning	3
MATH 1160	Precalculus Mathematics	5
MATH 1300	Finite Mathematics	3
MATH 1360	Geometric Concepts	3
MATH 4060	Connecting Geometry to Middle and Secondary Schools	3
MATH 4070	Connecting Algebra to Middle and Secondary Schools	3
MATH 4080	Calculus Connections	3
MATH 2320	Discrete Mathematical Structures	3
STAT 4050	Connecting Statistics to Middle and Secondary Schools	3

### Required Option Area

All middle school education majors are required to select one option area. (Option areas do print on transcripts or diplomas.) Please select one of the following:

## Option Area: Art (Grades K-9)

ART_GNRL 1020	Appreciation of Art	3
ART_GNRL 1040	Basic 3-D Design	3
ART_DRAW 1050	Drawing I	3
ART_CERM 2100	Beginning Ceramics	3
ART_FIBR 2300	Beginning Fibers	3
ART_PNT 2500	Beginning Painting	3
ART_PRNT 2700	Beginning Printmaking	3
or ART_PRNT 2730	Serigraphy	
LTC 4730 & LTC 4734	Overview of Art Education and Overview of Art Education Field Experience	4
LTC 4740 & LTC 4744	Inquiry into Art Education: Pre-School Through Middle School and Inquiry into Art Education: Pre-School Through Middle School Field Experience	4

## Option Area: Language Arts

ENGLISH 2010	Intermediate Composition	3
ENGLISH 2100	Writing About Literature	3
ENGLISH 3310	Survey of American Literature: 1865-Present	3
LTC 4460	Teaching English to Speakers of Other Languages	3

### 19th Century Literature/African-American/Folklore

ENGLISH 3110	Special Themes in Literature	3
or ENGLISH 3400	Survey of African American Literature, Beginnings to 1900	
or ENGLISH 3410	Survey of African American Literature, 1900-Present	
or ENGLISH 4700	Special Themes in Folklore	

### 20th Century Literature by and about Women

ENGLISH 4169	Major Authors, 1890-Present	3
or ENGLISH 4188	Major Women Writers, 1789-1890	
or ENGLISH 4189	Major Women Writers, 1890-Present	
or ENGLISH 4210	Medieval Literature	

### Writing

ENGLISH 1510	Creative Writing: Introduction to Fiction	3
or ENGLISH 1530	Creative Writing: Introduction to Poetry	
or ENGLISH 4510	Creative Writing: Advanced Fiction	
or ENGLISH 4530	Creative Writing: Advanced Poetry	
LTC 4380 & LTC 4384	Teaching Middle School Language Arts I and Teaching Middle School Language Arts I Field Experience	4
LTC 4390 & LTC 4394	Teaching Middle and Secondary English/Language Arts II and Teaching Middle School Language Arts II Field Experience	4

## Option Area: Science

CHEM 1320	College Chemistry I	4
PHYSCS 2330	Exploring the Principles of Physics	4
GEOL 1100	Principles of Geology with Laboratory	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5

BIO_SC 1060	Basic Environmental Studies	3
or NAT_R 1060	Ecology and Conservation of Living Resources	
ASTRON 1010	Introduction to Astronomy	3-4
or ATM_SC 1050	Introductory Meteorology	
LTC 4340 & LTC 4344	Middle School Science I and Middle School Science Field I	4

## Option Area: Social Studies

HIST 1100	Survey of American History to 1865	3
HIST 1200	Survey of American History Since 1865	3
HIST 1500	Foundations of Western Civilization	3
World History Elective		3
Geography Elective		3
POL_SC 1100	American Government	3
Economics Elective		3
LTC 4320 & LTC 4324	Middle School Social Studies I and Middle School Social Studies Field I	4

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1130	1	ENGLISH 1000	3
MATH 1100	3	GEOL 1100	4
HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	Humanities Elective	3
COMMUN 1200	3	STAT 1200	3
LTC 1200	2		
	15		16
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
BIO_SC 1010	3	Writing Intensive	3
Humanities Elective	3	MATH 1300	3
MATH 1160	5	MATH 1360	3
Option Area Content	3	Option Area Content	3
	18		16
Third Year			
Fall	Credits	Spring	Credits
LTC 4360	3	LTC 4420	3
LTC 4364	1	LTC 4424	1
Option Area Methods	3	SPC_ED 4020	3
Option Area Field	1	MATH 4070	3
MATH 4060	3	STAT 4050	3
MATH 4080	3	Option Area Content	3

Option Area Content	3	Option Area Content	3
	17		19
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ED_LPA 4060	3	LTC 4971	14
LTC 4370	3		
LTC 4374	1		
LTC 4410	3		
MATH 2320	3		
Option Area Content	3		
	16		14
Total Credits: 131			

## BSEd in Middle School Education with Emphasis in Science

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

<b>Professional Education</b>		44
<b>Phase I</b>		
LTC 1130	Orientation: Middle School Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
<b>Phase II</b>		
LTC 4340 & LTC 4344	Middle School Science I and Middle School Science Field I	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4350 & LTC 4354	Middle School Science II and Middle School Science Field Experience	4
LTC 4420 & LTC 4424	Adolescent Literacy and Middle School Literacy Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4410	Teaching, Engaging and Assessing Middle-Level Students	3
<b>Phase III</b>		
LTC 4971	Internship and Capstone Seminar	14
<b>Content Area</b>		30
CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
PHYSCS 1210	College Physics I	4
PHYSCS 2330	Exploring the Principles of Physics	4
GEOL 1100	Principles of Geology with Laboratory	4
ATM_SC 1050	Introductory Meteorology	3
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
BIO_SC 1060	Basic Environmental Studies	3

or BIO\_SC 2060 Community Biology  
 or NAT\_R 1060 Ecology and Conservation of Living Resources

### Required Option Area

All middle school education majors are required to select one option area. (Option areas do not appear on transcripts or diplomas.) Please select one of the following:

#### Option Area: Art (Grades K-9)

ART_GNRL 1020	Appreciation of Art	3
ART_GNRL 1040	Basic 3-D Design	3
ART_DRAW 1050	Drawing I	3
ART_CERM 2100	Beginning Ceramics	3
ART_FIBR 2300	Beginning Fibers	3
ART_PNT 2500	Beginning Painting	3
ART_PRNT 2700	Beginning Printmaking	3
or ART_PRNT 2730	Serigraphy	
LTC 4730 & LTC 4734	Overview of Art Education and Overview of Art Education Field Experience	4
LTC 4740 & LTC 4744	Inquiry into Art Education: Pre-School Through Middle School and Inquiry into Art Education: Pre-School Through Middle School Field Experience	4

#### Option Area: Language Arts

ENGLSH 2010	Intermediate Composition	3
ENGLSH 2100	Writing About Literature	3
ENGLSH 3310	Survey of American Literature: 1865-Present	3
LTC 4460	Teaching English to Speakers of Other Languages	3
<b>19th Century Literature/African-American/Folklore</b>		
ENGLSH 3110	Special Themes in Literature	1-3
or ENGLSH 3400	Survey of African American Literature, Beginnings to 1900	
or ENGLSH 3410	Survey of African American Literature, 1900-Present	
or ENGLSH 4700	Special Themes in Folklore	
<b>20th Century Literature by and about Women</b>		
ENGLSH 4169	Major Authors, 1890-Present	3
or ENGLSH 4188	Major Women Writers, 1789-1890	
or ENGLSH 4189	Major Women Writers, 1890-Present	
or ENGLSH 4210	Medieval Literature	
<b>Writing</b>		
ENGLSH 1510	Creative Writing: Introduction to Fiction	3
or ENGLSH 1530	Creative Writing: Introduction to Poetry	
or ENGLSH 4510	Creative Writing: Advanced Fiction	
or ENGLSH 4530	Creative Writing: Advanced Poetry	
LTC 4380 & LTC 4384	Teaching Middle School Language Arts I and Teaching Middle School Language Arts I Field Experience	4

LTC 4390 & LTC 4394	Teaching Middle and Secondary English/ Language Arts II and Teaching Middle School Language Arts II Field Experience	4
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### Option Area: Math

MATH 1160	Precalculus Mathematics	5
MATH 1300	Finite Mathematics	3
MATH 1360	Geometric Concepts	3
MATH 4060	Connecting Geometry to Middle and Secondary Schools	3
MATH 4070	Connecting Algebra to Middle and Secondary Schools	3
MATH 4080	Calculus Connections	3
STAT 1200	Introductory Statistical Reasoning	3
LTC 4360 & LTC 4364	Intro. Teaching Mathematics in Middle and Secondary Schools and Intro. Teaching Math in Middle and Secondary School Field Experience	4

### Option Area: Social Studies

HIST 1100	Survey of American History to 1865	3
HIST 1200	Survey of American History Since 1865	3
HIST 1500	Foundations of Western Civilization	3
World History Elective		3
Geography Elective		3
POL_SC 1100	American Government	3
Economics Elective		3
LTC 4320 & LTC 4324	Middle School Social Studies I and Middle School Social Studies Field I	4

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1130	1	ENGLSH 1000	3
MATH 1100	3	STAT 1200	3
HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	Humanities Elective	3
COMMUN 1200	3	CHEM 1320	4
LTC 1200	2		
	15		16
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
Humanities Elective	3	Writing Intensive	3
CHEM 1330	4	BIO_SC 1500	5

GEOL 1100	4	ATM_SC 1050	3
Option Area Content	3	Option Area Content	3
	18		18
Third Year			
Fall	Credits	Spring	Credits
LTC 4340	3	LTC 4350	3
LTC 4344	1	LTC 4354	1
Option Area Methods	3	LTC 4420	3
Option Area Field	1	LTC 4424	1
PHYSICS 2330	4	SPC_ED 4020	3
Option Area Content	3	PHYSICS 1210	4
Option Area Content	3	Option Area Content	3
	18		18
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14
LTC 4410	3		
BIO_SC 1060	3		
Option Area Content	3		
Option Area Content	3		
	15		14
Total Credits: 132			

## BSEd in Middle School Education with Emphasis in Social Studies

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Professional Education		44
Phase I		
LTC 1130	Orientation: Middle School Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiring into Schools, Community and Society: Field	4
Phase II		
SPC_ED 4020	Inquiry into Learning II	3
LTC 4320 & LTC 4324	Middle School Social Studies I and Middle School Social Studies Field I	4
LTC 4420 & LTC 4424	Adolescent Literacy and Middle School Literacy Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4334	Middle School Social Studies Field Experience II	1
LTC 4410	Teaching, Engaging and Assessing Middle-Level Students	3
LTC 4550	Assessment in Social Studies	3
Phase III		

LTC 4971	Internship and Capstone Seminar	14
<b>Content Area</b>		<b>33</b>
<b>American History</b>		
HIST 1100	Survey of American History to 1865	3
HIST 1200	Survey of American History Since 1865	3
American History Elective		3
<b>World History</b>		
HIST 1500	Foundations of Western Civilization	3
or HIST 1510	History of Modern Europe	
World History Electives		6
POL_SC 1100	American Government	3
Economics Elective		3
Geography Elective		3
Psychology Elective		3
Non-Western History or Asian Geography Elective		3

## Required Option Area

All middle school education majors are required to select one option area. (Option areas do not print on transcripts or diplomas.) Please select one of the following:

### Option Area: Art (Grades K-9)

ART_GNRL 1020	Appreciation of Art	3
ART_GNRL 1040	Basic 3-D Design	3
ART_DRAW 1050	Drawing I	3
ART_CERM 2100	Beginning Ceramics	3
ART_FIBR 2300	Beginning Fibers	3
ART_PNT 2500	Beginning Painting	3
ART_PRNT 2700	Beginning Printmaking	3
or ART_PRNT 2730	Serigraphy	
LTC 4730 & LTC 4734	Overview of Art Education and Overview of Art Education Field Experience	4
LTC 4740 & LTC 4744	Inquiry into Art Education: Pre-School Through Middle School and Inquiry into Art Education: Pre-School Through Middle School Field Experience	4

### Option Area: Language Arts

ENGLISH 2010	Intermediate Composition	3
ENGLISH 2100	Writing About Literature	3
ENGLISH 3310	Survey of American Literature: 1865-Present	3
LTC 4460	Teaching English to Speakers of Other Languages	3
<b>19th Century Literature/African-American/Folklore</b>		
ENGLISH 3110	Special Themes in Literature	1-3
or ENGLISH 3400	Survey of African American Literature, Beginnings to 1900	
or ENGLISH 3410	Survey of African American Literature, 1900-Present	
or ENGLISH 4700	Special Themes in Folklore	
<b>20th Century Literature by and about Women</b>		
ENGLISH 4169	Major Authors, 1890-Present	3

or ENGLISH 4188	Major Women Writers, 1789-1890	
or ENGLISH 4189	Major Women Writers, 1890-Present	
or ENGLISH 4210	Medieval Literature	

### Writing

ENGLISH 1510	Creative Writing: Introduction to Fiction	3
or ENGLISH 1530	Creative Writing: Introduction to Poetry	
or ENGLISH 4510	Creative Writing: Advanced Fiction	
or ENGLISH 4530	Creative Writing: Advanced Poetry	
LTC 4380 & LTC 4384	Teaching Middle School Language Arts I and Teaching Middle School Language Arts I Field Experience	4
LTC 4390 & LTC 4394	Teaching Middle and Secondary English/ Language Arts II and Teaching Middle School Language Arts II Field Experience	4

### Option Area: Math

MATH 1160	Precalculus Mathematics	5
MATH 1300	Finite Mathematics	3
MATH 1360	Geometric Concepts	3
MATH 4060	Connecting Geometry to Middle and Secondary Schools	3
MATH 4070	Connecting Algebra to Middle and Secondary Schools	3
MATH 4080	Calculus Connections	3
STAT 1200	Introductory Statistical Reasoning	3
LTC 4360 & LTC 4364	Intro. Teaching Mathematics in Middle and Secondary Schools and Intro. Teaching Math in Middle and Secondary School Field Experience	4

### Option Area: Science

CHEM 1320	College Chemistry I	4
PHYSICS 2330	Exploring the Principles of Physics	4
GEOL 1100	Principles of Geology with Laboratory	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
BIO_SC 1060	Basic Environmental Studies	3
or NAT_R 1060	Ecology and Conservation of Living Resources	
ASTRON 1010	Introduction to Astronomy	3-4
or ATM_SC 1050	Introductory Meteorology	
LTC 4340 & LTC 4344	Middle School Science I and Middle School Science Field I	4

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1130	1	ENGLISH 1000	3
MATH 1100	3	BIO_SC 1010	3



HIST 1100	3	STAT 1200	3
PSYCH 1000	3	Humanities Elective	3
COMMUN 1200	3	HIST 1200	3
LTC 1200	2		
	<b>15</b>		<b>15</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
GEOL 1100	4	Writing Intensive	3
Humanities Elective	3	POL_SC 1100	3
HIST 1500	3	Option Area Content	3
Option Area Content	3	Option Area Content	3
	<b>17</b>		<b>16</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
SPC_ED 4020	3	LTC 4320	3
Option Area Methods	3	LTC 4324	1
Option Area Field	1	LTC 4420	3
American History Elective	3	LTC 4424	1
GEOG 1100	3	World History Elective	3
Option Area Content	3	ECONOM 1014	3
Option Area Content	3	Option Area Content	3
	<b>19</b>		<b>17</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ED_LPA 4060	3	LTC 4971	14
LTC 4334	1		
LTC 4410	3		
LTC 4550	3		
World History Elective	3		
Non-Western World History	3		
	<b>16</b>		<b>14</b>
Total Credits: 129			

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## Secondary Education

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Dr. Wendy Sims, Director of Teacher Education  
Department of Learning, Teaching and Curriculum  
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TeacherEducation@missouri.edu

Professional education coursework is delivered by four departments within the College of Education, namely, Learning, Teaching and Curriculum; Special Education; Educational Leadership and Policy Analysis; and Educational, School and Counseling Psychology.

### Faculty

**Professor** E. A. Baker\*\*, L. H. Barrow\*\*, J. Baumann\*\*, B. Dougherty\*\*, R. F. Fox\*\*, A. Hoard\*, S. Palonsky\*\*, B. B. Reys\*\*, R. E. Reys\*\*, R. D. Robinson\*\*, T. Sadler\*\*, W. Sims\*\*

**Associate Professor** L. Bennett\*\*, K. B. Chval\*\*, P. J. Friedrichsen\*\*, C. Gilles\*, D. L. Hanuscin\*\*, N. Knipping\*, J. Lannin\*\*, J. E. Tarr\*\*, K. Unrath\*\*

**Associate Professor Emeritus** M. Volkman\*\*

**Assistant Professor** T. Castro\*\*, Z. de Araujo, M. Klosterman\*, C. Kuby\*\*, A. Lannin\*\*, M. Major\*, S. Otten, R. Pinnow\*, L. Sanchez\*\*, M. Siegel\*\*, B. Silvey\*\*

**Emeritus Research Professor** D. A. Grouws\*\*

**Associate Teaching Professor** A. Barbis\*, L. Kingsley\*, J. Ostrow\*

**Assistant Teaching Professor** A. Ashcraft\*, J. Clifton\*, L. Neier\*, B. Smith\*

**Assistant Clinical Professor** A. Waldron\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 378)
- BSEd in Secondary Education (p. 378)
  - with emphasis in Art Education (p. 379)
  - with emphasis in Biology (p. 380)
  - with emphasis in Chemistry (p. 381)
  - with emphasis in Earth Sciences (p. 382)
  - with emphasis in General Science (p. 383)
  - with emphasis in Language Arts (p. 383)
  - with emphasis in Mathematics Education (p. 384)
  - with emphasis in Music Education (p. 385)
  - with emphasis in Physics (p. 389)
  - with emphasis in Social Studies (p. 390)

The requirements for the Bachelor of Science in Education are specified in three areas: University general education (p. 18), professional education and a teaching major. All students preparing to be teachers in early childhood, elementary, special education, middle or secondary schools, regardless of the major field, are required to complete the

University general education (p. 18) program. Students transferring from other institutions are required to fulfill the equivalencies of these courses.

### Graduate

The Secondary Education Program at the University of Missouri includes degree programs that focus on preparing graduates to teach in grades 9-12. The College of Education does not currently offer a graduate degree specifically to Secondary Education. However, we do offer Masters (M.Ed.) and doctorates (Ph.D) in the following areas.

- Math
- English/Language Arts
- Science
- Social Studies
- Art
- Music

We also offer a graduate degree in "Reading/Literacy Education" at the M.Ed., Ed.S., Ed.D, and Ph.D. levels.

You can find out more about the programs by going to [http://education.missouri.edu/academics/graduate\\_studies/index.php](http://education.missouri.edu/academics/graduate_studies/index.php).

### Courses

Courses on Secondary Education can be found within the subject area of Learning, Teaching and Curriculum (LTC).

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## Undergraduate

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### Department Level Requirements - Secondary Education

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The BSEd in Secondary Education does not contain any departmental requirements.

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### BSEd in Secondary Education

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#### Major Program Requirements

The BSEd in Secondary Education is offered in ten emphasis areas: Art Education (p. 379), Biology (p. 380), Chemistry (p. 381), Earth Sciences (p. 382), General Science (p. 383), Language Arts (p. 383), Mathematics Education (p. 384), Music Education (p. 385), Physics (p. 389), and Social Studies (p. 390). Students must choose one of the emphasis areas to earn the BSEd. Details on the requirements for the programs are listed under each emphasis.

#### Semester Plan

A sample plan of study has not been designed for this major, as students are required to select an emphasis. Refer to the semester plans designed for the emphasis in Art Education (p. 379), Biology (p. 380), Chemistry (p. 381), Earth Sciences (p. 382), General Sciences (p. 383), Language Arts (p. 383), Mathematics Education (p. 384), Music Education (p. 385), Physics (p. 389), or Social Studies (p. 390).

# BSEd in Secondary Education with Emphasis in Art Education

## Major Program Requirements

Students who wish to teach art pursue the BSEd degree. BA and BFA candidates may acquire art teaching certification by completing the art education requirements not already completed in the BA or BFA programs.

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

### Professional Education 43

#### Phase I

LTC 1110	Orientation: Art Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

#### Phase II

LTC 4560	Teaching Reading in the Content Areas	2-3
LTC 4730 & LTC 4734	Overview of Art Education and Overview of Art Education Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4740 & LTC 4744	Inquiry into Art Education: Pre-School Through Middle School and Inquiry into Art Education: Pre-School Through Middle School Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4750 & LTC 4754	Inquiry into Art Education: Secondary and Inquiry into Art Education: Secondary Field Experience	4

#### Phase III

LTC 4971	Internship and Capstone Seminar	14
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### Content Area 47-48

#### Art History

ART_GNRL 1020	Appreciation of Art	3
AR_H_A 1110 or AR_H_A 1120	Ancient and Medieval Art Renaissance through Modern Art	3
AR_H_A 2830	American Art and Architecture	3
AR_H_A 3760 or AR_H_A 3740	Contemporary Art (Recommended) Nineteenth Century European Art	3
or AR_H_A 3750	Modern Art in Europe and America	
Electives in Studio Art/Art History (Recommended LTC 4085)		9

#### Studio Art

ART_GNRL 1030	Basic 2-D Design	3
ART_FIBR 2300	Beginning Fibers	3
ART_DRAW 1050	Drawing I	3
ART_DRAW 2200	Drawing II	3
ART_PNT 2510	Beginning Watercolor Painting	3

or ART_PNT 2500	Beginning Painting	
ART_SCUL 2800	Beginning Sculpture	3
or ART_GNRL 1040	Basic 3-D Design	
ART_CERM 2100	Beginning Ceramics	3
ART_PRNT 2700	Beginning Printmaking	3
or ART_PRNT 2730	Serigraphy	
IS_LT 4361	Introduction to Digital Media	2-3
or ART_GRDN 1400	Beginning Digital Imaging	
ART_GRDN 2400	Advanced Digital Imaging (must be taken with ART_GRDN 1400)	

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1110	1	MATH 1100	3
ENGLISH 1000	3	BIO_SC 1010	3
PSYCH 1000	3	HIST 1100	3
COMMUN 1200	3	ART_GNRL 1030	3
ART_GNRL 1020	3	AR_H_A 1120	3
	13		15
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
STAT 1200	3	GEOL 1100	4
Social/Behavioral Elective	3	AR_H_A 2830	3
ART_DRAW 1050	3	ART_FIBR 2300	3
ART_PNT 2510	3	ART_DRAW 2200	3
	16		17
Third Year			
Fall	Credits	Spring	Credits
LTC 4560	2	LTC 4740	3
LTC 4730	3	LTC 4744	1
LTC 4734	1	SPC_ED 4020	3
AR_H_A 3760	3	ART_CERM 2100	3
ART_SCUL 2800	3	ART_PRNT 2700	3
Studio Elective Course	3	Studio Elective Course	3
	15		16
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14

LTC 4750	3		
LTC 4754	1		
IS_LT 4361	3		
Studio Elective Course	3		
Possible Elective	3		
	16		14
Total Credits: 122			

## BSEd in Secondary Education with Emphasis in Biology

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Students have the choice to complete a single subject or unified science endorsement. The unified science endorsement creates the opportunity to teach any of the beginning sciences. A list of the additional courses for the unified science endorsement can be found at the end of the list of required courses for each of the science areas.

#### Professional Education 43

##### Phase I

LTC 1155	Orientation: Science Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

##### Phase II

LTC 4560	Teaching Reading in the Content Areas	2
LTC 4631 & LTC 4634	Teach.Sci.Second.Sch.:Phil.,Hist., Sci.Inq.,Curr., Assm., & Teach I and Teaching Middle and Secondary Science I Field	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4641 & LTC 4644	Teaching Middle and Secondary Science II and Teaching Middle and Secondary Science II Field	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4651 & LTC 4654	Teach.Sci.Second.Sch.:Phil.,Hist.,Sci.Inq.,Curr.,Ass & Tech III and Teach Sci Second Sch: Phil,Hist,Sci Inq,Curr,Assm & Tech III Fld	4

##### Phase III

LTC 4971	Internship and Capstone Seminar	14
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#### Content Area 51-55

##### Biology

BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
BIO_SC 2200	General Genetics	4
BIO_SC 2300	Introduction to Cell Biology	4
BIO_SC 4600	Evolution	3
BIO_SC 3650	General Ecology	5
BIO_SC 3700	Animal Physiology	5

or MPP 3202 Elements of Physiology

Botany-Choose One: 3-5

BIO\_SC 1200 General Botany with Laboratory

BIO\_SC 3210 Plant Systematics

BIO\_SC 4320 Plant Physiology

BIO\_SC 4660 Plant Population Biology

Biology Elective 3-5

##### Chemistry

CHEM 1320 College Chemistry I 4

CHEM 1330 College Chemistry II 4

CHEM 2030 Survey of Organic Chemistry 3

##### Earth Science

GEOL 1200 Environmental Geology with Laboratory 4

##### Physics

PHYSICS 1210 College Physics I 4

Unified Science-Biology Endorsement 11

Complete all coursework for Biology plus:

##### Earth Science

ASTRON 1010 Introduction to Astronomy 4

ATM\_SC 1050 Introductory Meteorology 3

##### Physics

PHYSICS 1220 College Physics II 4

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1155	1	ENGLISH 1000	3
MATH 1100	3	MATH 1400	3
HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	COMMUN 1200	3
BIO_SC 1500	5	BIO_SC 2200	4
	15		16
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
Humanities Elective	3	Humanities Elective	3
BIO_SC 2300	4	BIO_SC 4600	3
CHEM 1320	4	CHEM 1330	4
	15		14
Third Year			
Fall	Credits	Spring	Credits
LTC 4560	2	LTC 4641	3
LTC 4631	3	LTC 4644	1
LTC 4634	1	SPC_ED 4020	3

BIO_SC 3700	5	Biology Elective	3-5
CHEM 2030	3	PHYSCS 1210	4
		GEOL 1200	4
	14		18-20
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ED_LPA 4060	3	LTC 4971	14
LTC 4651	3		
LTC 4654	1		
BIO_SC 3650	5		
Botany Course	3-5		
	15-17		14
Total Credits: 121-125			

## BSEd in Secondary Education with Emphasis in Chemistry

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Students have the choice to complete a single subject or unified science endorsement. The unified science endorsement creates the opportunity to teach any of the beginning sciences. A list of the additional courses for the unified science endorsement can be found at the end of the list of required courses for each of the science areas.

#### Professional Education 43

##### Phase I

LTC 1155	Orientation: Science Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

##### Phase II

LTC 4560	Teaching Reading in the Content Areas	2
LTC 4631 & LTC 4634	Teach.Sci.Second.Sch.:Phil.,Hist., Sci.Inq.,Curr., Assm., & Teach I and Teaching Middle and Secondary Science I Field	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4641 & LTC 4644	Teaching Middle and Secondary Science II and Teaching Middle and Secondary Science II Field	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4651 & LTC 4654	Teach.Sci.Second.Sch.:Phil.,Hist.,Sci.Inq.,Curr.,Ass & Tech III and Teach Sci Second Sch: Phil,Hist,Sci Inq,Curr,Assm & Tech III Fld	4

##### Phase III

LTC 4971	Internship and Capstone Seminar	14
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#### Content Area 46-47

#### Chemistry

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
CHEM 3200	Quantitative Methods of Analysis with Lab	4
CHEM 3300	Fundamentals of Physical Chemistry	3
BIOCHM 3630	General Biochemistry	3

#### Biology

BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
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#### Earth Science

GEOL 1200	Environmental Geology with Laboratory	4
Choose One:		3-4
ATM_SC 1050	Introductory Meteorology	
ASTRON 1010	Introduction to Astronomy	

#### Physics

PHYSCS 1210	College Physics I	4
PHYSCS 1220	College Physics II	4

#### Unified Science-Chemistry Endorsement 18-21

Complete coursework for Chemistry plus:

#### Biology

BIO_SC 2200	General Genetics	4
BIO_SC 3650	General Ecology	5
BIO_SC 4600	Evolution	3
Botany-Choose One:		3-5

BIO\_SC 1200 General Botany with Laboratory

BIO\_SC 3210 Plant Systematics

BIO\_SC 4400 Plant Anatomy

BIO\_SC 4320 Plant Physiology

BIO\_SC 4660 Plant Population Biology

PLNT\_S 4500 Biology and Pathogenesis of Plant-Associated Microbes

#### Earth Science

Complete one (cannot be same course as completed in content area):

ATM\_SC 1050 Introductory Meteorology

ASTRON 1010 Introduction to Astronomy

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

<b>First Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 1155	1	ENGLISH 1000	3
MATH 1100	3	MATH 1500	5

HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	COMMUN 1200	3
CHEM 1320	4	CHEM 1330	4
	<b>14</b>		<b>18</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
MATH 1700	5	Humanities Elective	3
Humanities Elective	3	CHEM 2110	3
CHEM 2100	3	CHEM 2130	2
		GEOL 1200	4
	<b>15</b>		<b>16</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4560	2	LTC 4641	3
LTC 4631	3	LTC 4644	1
LTC 4634	1	SPC_ED 4020	3
BIO_SC 1500	5	CHEM 3200	4
PHYSCS 1210	4	BIOCHM 3630	3
		PHYSCS 1220	4
	<b>15</b>		<b>18</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ED_LPA 4060	3	LTC 4971	14
LTC 4651	3		
LTC 4654	1		
CHEM 3300	3		
Earth Science Course	3-4		
	<b>13-14</b>		<b>14</b>
Total Credits: 123-124			

## BSEd in Secondary Education with Emphasis in Earth Sciences

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Students have the choice to complete a single subject or unified science endorsement. The unified science endorsement creates the opportunity to teach any of the beginning sciences. A list of the additional courses for the unified science endorsement can be found at the end of the list of required courses for each of the science areas.

#### Professional Education 43

<b>Phase I</b>		
LTC 1155	Orientation: Science Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4

LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
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#### Phase II

LTC 4560	Teaching Reading in the Content Areas	2
LTC 4631 & LTC 4634	Teach.Sci.Second.Sch.:Phil.,Hist., Sci.Inq.,Curr., Assm., & Teach I and Teaching Middle and Secondary Science I Field	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4641 & LTC 4644	Teaching Middle and Secondary Science II and Teaching Middle and Secondary Science II Field	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4651 & LTC 4654	Teach.Sci.Second.Sch.:Phil.,Hist.,Sci.Inq.,Curr.,Ass & Tech III and Teach Sci Second Sch: Phil,Hist,Sci Inq,Curr,Assm & Tech III Fld	4

#### Phase III

LTC 4971	Internship and Capstone Seminar	14
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#### Content Area 49

##### Earth Science

GEOL 1200	Environmental Geology with Laboratory	4
GEOL 1250	The World's Oceans	3
GEOL 2150	The Age of the Dinosaurs	3
GEOL 2350 & GEOL 2360	Historical Geology and Historical Geology Laboratory	4
GEOL 2400	Surficial Earth Processes and Products with Laboratory	4
GEOL 2500	Regional Geology Field Trip	3
GEOL 3250	Mineralogy	5
GEOL 3800	Sedimentology with Lab	4
GEOL 4150	Structural Geology	4
ATM_SC 1050	Introductory Meteorology	3
ASTRON 1010	Introduction to Astronomy	4

##### Biology

Choose one:		5
BIO_SC 1500	Introduction to Biological Systems with Laboratory	
BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory	

##### Chemistry

CHEM 1320	College Chemistry I	4
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##### Physics

PHYSCS 1210	College Physics I	4
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#### Unified Science-Earth Science Endorsement

##### Biology

BIO_SC 2200	General Genetics	4
BIO_SC 3650	General Ecology	5
BIO_SC 4600	Evolution	3
Botany-Choose One:		3-5
BIO_SC 1200	General Botany with Laboratory	
BIO_SC 3210	Plant Systematics	

BIO_SC 4400	Plant Anatomy	
BIO_SC 4320	Plant Physiology	
BIO_SC 4660	Plant Population Biology	
PLNT_S 4500	Biology and Pathogenesis of Plant-Associated Microbes	
<b>Chemistry</b>		
CHEM 1330	College Chemistry II	4
<b>Physics</b>		
PHYSICS 1220	College Physics II	4

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1155	1	ENGLSH 1000	3
MATH 1100	3	POL_SC 1100	3
HIST 1100	3	PSYCH 1000	3
COMMUN 1200	3	GEOL 1250	3
GEOL 1200	4	CHEM 1320	4
	14		16
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
Humanities Elective	3	Humanities Elective	3
ATM_SC 1050	3	GEOL 2150	3
BIO_SC 1500	5	GEOL 2350 & GEOL 2360	4
		MATH 1400	3
	15		17
Third Year			
Fall	Credits	Spring	Credits
LTC 4560	2	LTC 4641	3
LTC 4631	3	LTC 4644	1
LTC 4634	1	SPC_ED 4020	3
GEOL 2400	4	GEOL 2500	3
GEOL 3250	5	GEOL 3800	4
		GEOL 4150	4
	15		18
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14
LTC 4651	3		
LTC 4654	1		
ASTRON 1010	4		

PHYSICS 1210	4	
	15	14
Total Credits: 124		

## BSEd in Secondary Education with Emphasis in General Science

The College of Education no longer offers a BSED in Secondary Education with emphasis in General Science. Please see our science emphasis areas (Biology (<https://nextcatalog.missouri.edu/undergraduategraduate/collegeofeducation/secondaryeducation/based-secondary-education-emphasis-biology>), Chemistry (<https://nextcatalog.missouri.edu/undergraduategraduate/collegeofeducation/secondaryeducation/based-secondary-education-emphasis-chemistry>), Earth Science (<https://nextcatalog.missouri.edu/undergraduategraduate/collegeofeducation/secondaryeducation/based-secondary-education-emphasis-earth-sciences>), Physics (<https://nextcatalog.missouri.edu/undergraduategraduate/collegeofeducation/secondaryeducation/based-secondary-education-emphasis-physics>)).

## BSEd in Secondary Education with Emphasis in Language Arts

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Professional Education		43
<b>Phase I</b>		
LTC 1170	Orientation: English/Language Arts	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
<b>Phase II</b>		
LTC 4560	Teaching Reading in the Content Areas	2
LTC 4470 & LTC 4474	Teaching Secondary English/Language Arts I and Teaching Secondary English/Language Arts I Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4480 & LTC 4484	Teaching Middle and Secondary English/Language Arts II and Teaching Secondary English/Language Arts II Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4490 & LTC 4494	Teaching Middle and Secondary English/Language Arts III and Teaching Secondary English/Language Arts III Field Experience	4
<b>Phase III</b>		
LTC 4971	Internship and Capstone Seminar	14
<b>Content Area</b>		45
ENGLSH 2010	Intermediate Composition	3

ENGLISH 2100	Writing About Literature	3
ENGLISH 3210	Survey of British Literature: Romanticism to the Present	3
ENGLISH 3300	Survey of American Literature: Beginnings to 1865	3
ENGLISH 3310	Survey of American Literature: 1865-Present	3
ENGLISH 4320	20th-Century American Literature	3
ENGLISH 4150	World Literatures	3
ENGLISH 4600	Structure of American English	3
ENGLISH 4610	History of the English Language	3
LTC 4460	Teaching English to Speakers of Other Languages	3

**Electives (One course from each category, 6hrs must be 4000 level)**

**British Literature**

ENGLISH 4210	Medieval Literature	3
or ENGLISH 4220 Renaissance and Seventeenth Century Literature		
or ENGLISH 4240 Restoration and 18th-Century English Literature		
or ENGLISH 4250 19th-Century English Literature		
or ENGLISH 4260 20th-Century British Literature		

**African American/Ethnic Literature**

ENGLISH 3420	Periods and Genres in African Diaspora Literature	3
or ENGLISH 3400 Survey of African American Literature, Beginnings to 1900		
or ENGLISH 3410 Survey of African American Literature, 1900-Present		
or ENGLISH 4120 Ethnic Literature		
or ENGLISH 4700 Special Themes in Folklore		

**Literature by and about Women**

ENGLISH 4180	Major Women Writers	3
or ENGLISH 4169 Major Authors, 1890-Present		
or ENGLISH 4181 Themes in Literature by Women		
or ENGLISH 4188 Major Women Writers, 1789-1890		
or ENGLISH 4189 Major Women Writers, 1890-Present		
or ENGLISH 4210 Medieval Literature		
or ENGLISH 4780 Women's Folklore and Feminist Theory		

**Literary Synthesis**

ENGLISH 4004	Topics in English-Social Science	3
or ENGLISH 3110 Special Themes in Literature		
or ENGLISH 4060 Studies in Critical Theory		
or ENGLISH 4160 Major Authors		

**Writing**

ENGLISH 1510	Creative Writing: Introduction to Fiction	3
or ENGLISH 1530 Creative Writing: Introduction to Poetry		
or ENGLISH 2030 Professional Writing		
or ENGLISH 3010 Advanced Composition		
or ENGLISH 4510 Creative Writing: Advanced Fiction		
or ENGLISH 4530 Creative Writing: Advanced Poetry		

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1170	1	MATH 1100	3
ENGLISH 1000	3	BIO_SC 1010	3
HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	Humanities	3
COMMUN 1200	3	ENGLISH 2010	3
Humanities	3		
	16		15
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
GEOL 1100	4	ENGLISH 3210	3
STAT 1200	3	ENGLISH 3300	3
ENGLISH 2100	3	ENGLISH 3420	3
ENGLISH 1510	3		
	17		13
Third Year			
Fall	Credits	Spring	Credits
LTC 4560	2	LTC 4480	3
LTC 4470	3	LTC 4484	1
LTC 4474	1	SPC_ED 4020	3
ENGLISH 3310	3	ENGLISH 4150	3
ENGLISH 4320	3	ENGLISH 4600	3
ENGLISH 4210	3	ENGLISH 4180	3
	15		16
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14
LTC 4490	3		
LTC 4494	1		
ENGLISH 4610	3		
LTC 4460	3		
ENGLISH 4004	3		
	16		14
Total Credits: 122			

## BSEd in Secondary Education with Emphasis in Mathematics Education

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

**Professional Education**

43

**Phase I**



LTC 1120	Orientation: Math Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
<b>Phase II</b>		
LTC 4560	Teaching Reading in the Content Areas	2-3
LTC 4571 & LTC 4574	Introduction to Teaching Mathematics in Middle and Secondary Schools and Intro. Teaching Math in Middle and Secondary School Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4581 & LTC 4584	Teaching Mathematics in Secondary Schools: Algebra and Teaching Math in Secondary Schools: Algebra Field Experience	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4590 & LTC 4594	Teach.Math in Sec.Schools: Focus on Geometry, Probability and Statistics and Teach Math in Sec Sch: Focus on Geometry/Probability	4
<b>Phase III</b>		
LTC 4971	Internship and Capstone Seminar	14
<b>Content Area *</b>		40
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 2320	Discrete Mathematical Structures	3
MATH 4060	Connecting Geometry to Middle and Secondary Schools	3
MATH 4140	Matrix Theory	3
MATH 4510	Higher Algebra	3
MATH 4350	Introduction to Non-Euclidean Geometry	3
STAT 4050	Connecting Statistics to Middle and Secondary Schools	3
CMP_SC 1040	Introduction to Problem Solving and Programming	3
Electives (Recommended Courses: MATH 4100, MATH 4300, MATH 4500, MATH 4700, MATH 4580, MATH 4560, MATH 4310, MATH 4330, MATH 4720, MATH 4150, MATH 4335, MATH 4340, MATH 4345, MATH 4400 or STAT 4750)		6

\* Mathematics courses must be taken on a graded basis. (A-F).

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1120	1	ENGLISH 1000	3
MATH 1160	5	BIO_SC 1010	3

HIST 1100	3	POL_SC 1100	3
PSYCH 1000	3	LTC 1200	2
COMMUN 1200	3	MATH 1500	5
	15		16
<b>Second Year</b>			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
Humanities Elective	3	PHYSICS 1210	4
MATH 1700	5	Humanities Elective	3
CMP_SC 1040	3	MATH 2300	3
	15		14
<b>Third Year</b>			
Fall	Credits	Spring	Credits
LTC 4560	2-3	LTC 4581	3
LTC 4571	3	LTC 4584	1
LTC 4574	1	SPC_ED 4020	3
MATH 2320	3	MATH 4350	3
MATH 4060	3	STAT 4050	3
MATH 4510	3	Math Elective	3
	15-16		16
<b>Fourth Year</b>			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	14
LTC 4590	3		
LTC 4594	1		
MATH 4140	3		
Math Elective	3		
Possible Elective	3		
	16		14
Total Credits: 121-122			

## BSEd in Secondary Education with Emphasis in Music Education

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

### Vocal Music Education

Professional Education		42
Phase I		
LTC 1140	Orientation: Music Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

Phase II		
LTC 4560	Teaching Reading in the Content Areas	2
LTC 4670 & LTC 4674	Teaching Music I and Teaching Music I Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4681 & LTC 4684	Teaching Music II and Teaching Music II Field Experience	3
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4690 & LTC 4694	Teaching Music III and Teaching Music III Field Experience	4

Phase III		
LTC 4971	Internship and Capstone Seminar	6-8
LTC 4971	Internship and Capstone Seminar	6-8

Content Area		55
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Music Theory		
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2

Conducting and Techniques		
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_I_VT 2633	Rehearsal Clinic: Choral Conducting	2
MUS_I_VT 2633	Rehearsal Clinic: Choral Conducting	2
MUSIC_NM 1612	Elementary Folk Guitar Class	1
MUS_I_VT 3670	Diction in Singing: Italian	1
MUS_I_VT 3671	Diction in Singing: German	1
MUS_I_VT 3672	Diction in Singing: French	1
MUS_THRY 4230	Choral Arranging	2
MUS_I_VT 3643	Symposium in Instrumental Music	2
OR Instrumental Music: 2 hours of Ensemble/Lessor Tech		

Studio Instruction and Ensembles		
MUS_APMS 2455	Studio Instruction	2
MUS_APMS 2455	Studio Instruction	2
MUS_APMS 2455	Studio Instruction	2

MUS_APMS 2455	Studio Instruction	2
MUS_APMS 3455	Studio Instruction	2
MUS_APMS 3455	Studio Instruction	2

Piano		
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1

Ensembles		
MUS_ENS 1842	Choral Ensemble	1
MUS_ENS 1842	Choral Ensemble	1
MUS_ENS 1842	Choral Ensemble	1
MUS_ENS 1842	Choral Ensemble	1
MUS_ENS 1842	Choral Ensemble	1
MUS_ENS 1842	Choral Ensemble	1
MUS_ENS 1842	Choral Ensemble	1

Recital Attendance		
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0

## Instrumental Music Education

Professional Education		42
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Phase I		
LTC 1140	Orientation: Music Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

Phase II		
LTC 4560	Teaching Reading in the Content Areas	2
LTC 4670 & LTC 4674	Teaching Music I and Teaching Music I Field Experience	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4681 & LTC 4684	Teaching Music II and Teaching Music II Field Experience	3
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4690 & LTC 4694	Teaching Music III and Teaching Music III Field Experience	4

Phase III		
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LTC 4971	Internship and Capstone Seminar	6-8
LTC 4971	Internship and Capstone Seminar	6-8
<b>Content Area</b>		<b>58</b>
<b>Music Theory</b>		
MUS_THRY 1220	Syntax, Structure and Style of Music I	2
MUS_THRY 1230	Aural Training and Sight Singing I	2
MUS_THRY 1221	Syntax, Structure and Style of Music II	2
MUS_THRY 1231	Aural Training and Sight Singing II	2
MUS_THRY 2220	Syntax, Structure and Style of Music III	2
MUS_THRY 2221	Syntax, Structure and Style of Music IV	2
MUS_THRY 2230	Aural Training and Sight Singing III	2
MUS_THRY 2231	Aural Training and Sight Singing IV	2
MUS_THRY 4220	20th Century Composition Techniques	2
<b>Conducting and Techniques</b>		
MUS_I_VT 2631	Basic Conducting and Score Reading	2
MUS_I_VT 2634	Rehearsal Clinic: Band Conducting	1
MUS_I_VT 2634	Rehearsal Clinic: Band Conducting	1
MUS_I_VT 2648	Percussion	1
MUS_I_VT 2640	Strings I	1
MUS_I_VT 2641	Strings II	1
MUS_I_VT 2637	Woodwinds I	1
MUS_I_VT 2638	Woodwinds II	1
MUS_I_VT 2645	Brass I	1
MUS_I_VT 2646	Brass II	1
MUS_THRY 4227	Orchestration	2
or MUS_THRY 4229	Band Arranging	
MUS_I_VT 3642	Seminar in String Techniques	1-2
or MUS_I_VT 3646	Marching Band Techniques	
MUS_I_VT 3644	Jazz Methods and Materials	1
Vocal Music:1 hour (voice lessons or choir)		
<b>Studio Instruction and Ensembles</b>		
MUS_APMS 2455	Studio Instruction	2
MUS_APMS 2455	Studio Instruction	2
MUS_APMS 2455	Studio Instruction	2
MUS_APMS 2455	Studio Instruction	2
MUS_APMS 3455	Studio Instruction	2

MUS_APMS 3455	Studio Instruction	2
<b>Piano</b>		
MUS_I_VT 1610	Group Piano for Music Majors I	1
MUS_I_VT 1611	Group Piano for Music Majors II	1
MUS_I_VT 2610	Group Piano for Music Majors III	1
MUS_I_VT 2611	Group Piano for Music Majors IV	1
<b>Ensembles</b>		
MUS_ENS 1841	Instrumental Ensemble	1
MUS_ENS 1841	Instrumental Ensemble	1
MUS_ENS 1841	Instrumental Ensemble	1
MUS_ENS 1841	Instrumental Ensemble	1
MUS_ENS 1841	Instrumental Ensemble	1
MUS_ENS 1841	Instrumental Ensemble	1
MUS_ENS 1841	Instrumental Ensemble	1
<b>Recital Attendance</b>		
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0
MUS_GENL 1091	Recital Attendance for Undergraduate Music Majors	0

## Semester Plan

Below is a sample plan of study, semester by semester, for the **vocal track**. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1140	1	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_APMS 2455	2	MUS_APMS 2455	2
MUS_ENS 1842	1	MUS_ENS 1842	1
MUS_GENL 1091	0	MUS_GENL 1091	0
PSYCH 1000	3	MUSIC_NM 1612	1
ENGLISH 1000	3	MATH 1100	3
		COMMUN 1200	3
	15		17
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010 or LTC 2040	3	LTC 2040 or ESC_PS 2010	3
ESC_PS 2014 or LTC 2044	1	LTC 2044 or ESC_PS 2014	1

MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_I_VT 2610	1	MUS_I_VT 2611	1
MUS_APMS 2455	2	MUS_APMS 2455	2
MUS_ENS 1842	1	MUS_ENS 1842	1
MUS_I_VT 3670	1	MUS_ENS 1842 (Lab Ensemble)	1
MUS_I_VT 3672	1	MUS_I_VT 3671	1
STAT 1200 or ESC_PS 4170	3	MUS_I_VT 2631	2
MUS_GENL 1091	0	MUS_GENL 1091	0
	<b>19</b>		<b>18</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4670	3	LTC 4681	2
LTC 4674	1	LTC 4684	1
MUS_THRY 4230 or MUS_I_VT 3643	2	SPC_ED 4020	3
MUS_I_VT 2633	2	LTC 4560	2
MUS_APMS 3455	2	MUS_I_VT 2633	2
MUS_ENS 1842	1	MUS_APMS 3455	2
MUS_THRY 4220	2	MUS_ENS 1842	1
American History or Political Science	3	Biological Science	3
MUS_APMS 1435 (piano or voice, recommended)	1	MUS_APMS 1435 (piano or voice, recommended)	1
MUS_GENL 1091	0	MUS_GENL 1091	0
	<b>17</b>		<b>17</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4690	3	LTC 4971	6-8
LTC 4694	1	LTC 4971	6-8
ED_LPA 4060	3		
MUS_THRY 4230 or MUS_I_VT 3643	2		
Physical Science with Lab	3-4		
MUS_ENS 1842	1		
Social/Behavioral Elective	3		
MUS_APMS 3455 (recommended)	2		
	<b>18-19</b>		<b>12-16</b>
Total Credits: 133-138			

Below is a sample plan of study, semester by semester, for the **instrumental track**. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

<b>First Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 1140	1	MUS_THRY 1221	2
MUS_THRY 1220	2	MUS_THRY 1231	2
MUS_THRY 1230	2	MUS_H_LI 1322	2
MUS_I_VT 1610	1	MUS_I_VT 1611	1
MUS_APMS 2455	2	MUS_APMS 2455	2

MUS_ENS 1841 (Marching Mizzou)	1	MUS_ENS 1841	1
MUS_ENS 1841	1	MUS_I_VT 2641, 2638, or 2646	1
MUS_GENL 1091	0	MATH 1100	3
PSYCH 1000	3	COMMUN 1200	3
ENGLISH 1000	3		
	<b>16</b>		<b>17</b>

<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ESC_PS 2010 or LTC 2040	3	LTC 2040 or ESC_PS 2010	3
ESC_PS 2014 or LTC 2044	1	LTC 2044 or ESC_PS 2014	1
MUS_THRY 2220	2	MUS_THRY 2221	2
MUS_THRY 2230	2	MUS_THRY 2231	2
MUS_H_LI 2307	2	MUS_H_LI 2308	2
MUS_I_VT 2610	1	MUS_I_VT 2611	1
MUS_APMS 2455	2	MUS_APMS 2455	2
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_I_VT 2645 or 2637	1	MUS_ENS 1841 (Lab Ensemble)	1
MUS_I_VT 2648	1	MUS_I_VT 2641, 2638, or 2646	1
STAT 1200 or ESC_PS 4170	3	MUS_I_VT 2631	2
MUS_GENL 1091	0	MUS_GENL 1091	0
	<b>19</b>		<b>18</b>

<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4670	3	LTC 4681	2
LTC 4674	1	LTC 4684	1
MUS_THRY 4229 or MUS_ENS 1842	1-2	SPC_ED 4020	3
MUS_I_VT 2634	1	MUS_I_VT 2634	1
MUS_APMS 3455	2	MUS_APMS 3455	2
MUS_ENS 1841	1	MUS_ENS 1841	1
MUS_THRY 4220	2	Biological Science	3
MUS_I_VT 2641	1	MUS_I_VT 2640, 2638, or 2646	1
MUS_I_VT 2637 or 2645	1	MUS_I_VT 3642 or 3646	1-2
MUS_I_VT 3644	1	American History or Political Science	3
MUS_GENL 1091	0	MUS_GENL 1091	0
	<b>14-15</b>		<b>18-19</b>

<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4690	3	LTC 4971	6-8
LTC 4694	1	LTC 4971	6-8
ED_LPA 4060	3		
LTC 4560	2		
MUS_THRY 4229 or MUS_ENS 1842	1-2		
MUS_ENS 1841	1		
Physical Science with Lab	3-4		
Social/Behavioral Elective	3		

MUS_APMS 3455 (recommended)	2	
	19-21	12-16
Total Credits: 133-141		

## BSEd in Secondary Education with Emphasis in Physics

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

Students have the choice to complete a single subject or unified science endorsement. The unified science endorsement creates the opportunity to teach any of the beginning sciences. A list of the additional courses for the unified science endorsement can be found at the end of the list of required courses for each of the science areas.

#### Professional Education

##### Phase I

LTC 1155	Orientation: Science Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4

##### Phase II

LTC 4560	Teaching Reading in the Content Areas	2
LTC 4631 & LTC 4634	Teach.Sci.Second.Sch.:Phil.,Hist., Sci.Inq.,Curr., Assm., & Teach I and Teaching Middle and Secondary Science I Field	4
SPC_ED 4020	Inquiry into Learning II	3
LTC 4641 & LTC 4644	Teaching Middle and Secondary Science II and Teaching Middle and Secondary Science II Field	4
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4651 & LTC 4654	Teach.Sci.Second.Sch.:Phil.,Hist.,Sci.Inq.,Curr.,Ass & Tech III and Teach Sci Second Sch: Phil,Hist,Sci Inq,Curr,Assm & Tech III Fld	4

##### Phase III

LTC 4971	Internship and Capstone Seminar	14
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#### Content Area 49

##### Physics

PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
PHYSICS 3150	Introduction to Modern Physics	3
PHYSICS 4060	Advanced Physics Laboratory I	3
PHYSICS 4080	Major Themes in Classical Physics	3
Physics Electives-Choose 4:		12
PHYSICS 3010 Introduction to Modern Astrophysics		
PHYSICS 3100 Teaching Physics (strongly recommended)		
PHYSICS 4050 Electronic Laboratory		

PHYSICS 4110 Light and Modern Optics

PHYSICS 4180 Solar System Science

PHYSICS 4190 Physics and Chemistry of Materials

#### Biology

Choose one: 5

BIO\_SC 1500 Introduction to Biological Systems with Laboratory

BIO\_SC 1010 General Principles and Concepts of Biology & BIO\_SC 1020 and General Biology Laboratory

#### Chemistry

CHEM 1320 College Chemistry I 4

#### Earth Science

GEOL 1200 Environmental Geology with Laboratory 4

**Unified Science-Physics Endorsement 25-27**

#### Biology

BIO\_SC 2200 General Genetics 4

BIO\_SC 3650 General Ecology 5

BIO\_SC 4600 Evolution 3

Botany-Choose one: 3-5

BIO\_SC 1200 General Botany with Laboratory

BIO\_SC 3210 Plant Systematics

BIO\_SC 4400 Plant Anatomy

BIO\_SC 4320 Plant Physiology

BIO\_SC 4660 Plant Population Biology

PLNT\_S 4500 Biology and Pathogenesis of Plant-Associated Microbes

#### Chemistry

CHEM 1330 College Chemistry II 4

#### Earth Science

ASTRON 1010 Introduction to Astronomy 4

ATM\_SC 1050 Introductory Meteorology 3

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1155	1	MATH 1700	5
MATH 1500	5	PSYCH 1000	3
ENGLISH 1000	3	PHYSICS 2750	5
COMMUN 1200	3		
CHEM 1320	4		
	16		13
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
MATH 2300	3	MATH 4100	3

HIST 1100	3	Humanities Elective	3
PHYSCS 2760	5	PHYSCS 3150	3
		BIO_SC 1010 & BIO_SC 1020	5
	15		18
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4560	2	LTC 4641	3
LTC 4631	3	LTC 4644	1
LTC 4634	1	SPC_ED 4020	3
POL_SC 1100	3	PHYSCS 3100	3
PHYSCS 4060	3	Physics Elective	3
PHYSCS 4080	3	Physics Elective	3
	15		16
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ED_LPA 4060	3	LTC 4971	14
LTC 4651	3		
LTC 4654	1		
Humanities Elective	3		
Physics Elective	3		
GEOL 1200	4		
	17		14
Total Credits: 124			

## BSEd in Secondary Education with Emphasis in Social Studies

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

#### Professional Education 43

Phase I			
LTC 1100	Orientation		1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience		4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field		4
Phase II			
LTC 4560	Teaching Reading in the Content Areas		2
LTC 4530 & LTC 4534	Introduction to Social Studies and Secondary Social Studies I Field Experience		4
SPC_ED 4020	Inquiry into Learning II		3
LTC 4541 & LTC 4544	Teaching Social Studies and Secondary Social Studies II Field Experience		4
ED_LPA 4060	Inquiring into Schools, Community and Society II		3
LTC 4550 & LTC 4554	Assessment in Social Studies and Secondary Social Studies III Field Experience		4
Phase III			

LTC 4971	Internship and Capstone Seminar		14
<b>Content Area</b>			<b>54</b>
American History			
HIST 1100	Survey of American History to 1865		3
HIST 1200	Survey of American History Since 1865		3
American History Electives			6
World History			
HIST 1500	Foundations of Western Civilization		3
or HIST 1510	History of Modern Europe		
Non-Western World (African or Asian)			3
World History Electives			6
Economics			
ECONOM 1014	Principles of Microeconomics		3
or ECONOM 1024	Fundamentals of Microeconomics		
ECONOM 1015	Principles of Macroeconomics		3
Geography			
GEOG 1100	Regions and Nations of the World I		3
GEOG 1200	Regions and Nations of the World II		3
Geography Elective (2000+ level)			3
Political Science			
POL_SC 1100	American Government		3
POL_SC 1400	International Relations		3
or POL_SC 2700	Comparative Political Systems		
Behavioral Science Electives (H_D_FS, PSYCH, SOCIOL, ANTHRO)			6
Social Studies Electives (from any content area within Social Studies)			3

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary depending on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1100	1	MATH 1100	3
ENGLISH 1000	3	BIO_SC 1010	3
COMMUN 1200	3	LTC 1200	2
Humanities Elective	3	HIST 1200	3
HIST 1100	3	HIST 1510	3
PSYCH 1000	3		
	16		14
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
GEOL 1100	4	Humanities Elective	3
STAT 1200	3	American History Elective	3
GEOG 1100	3	GEOG 1200	3

American History Elective	3	POL_SC 1100	3
	<b>17</b>		<b>16</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
LTC 4560	2	LTC 4541	3
LTC 4530	3	LTC 4544	1
LTC 4534	1	SPC_ED 4020	3
World History Elective	3	World History Elective	3
ECONOM 1014	3	ECONOM 1015	3
Behavioral Science Elective	3	Geography 2000+	3
	<b>15</b>		<b>16</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ED_LPA 4060	3	LTC 4971	14
LTC 4550	3		
LTC 4554	1		
Non-Western World Elective	3		
POL_SC 1400 or 2700	3		
Social Studies Elective	3		
	<b>16</b>		<b>14</b>
Total Credits: 124			

## Special Education

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Our mission is to prepare educators to work with children, youth and adults with disabilities to be academically and socially successful life-long learners. The department offers comprehensive degree programs that blend pedagogy and practices across developmental, specific content, and exceptionality to prepare educators to work with individuals at-risk and those with disabilities. In addition, the department offers comprehensive programs within exceptionalities, curriculum development for learners with disabilities, policy, and research across the lifespan.

**Contact us:**

303 Townsend Hall  
Columbia, MO 65211  
phone: 573-882-3742  
fax: 573-884-2917  
email: [umccoesped@missouri.edu](mailto:umccoesped@missouri.edu)  
website: <http://education.missouri.edu/SPED/index.php>

Dr. Erica Lembke  
Associate Professor & Undergraduate Advisor  
email: [LembkeE@missouri.edu](mailto:LembkeE@missouri.edu)

**For Graduate questions Contact:**

Dr. Delinda van Garderen  
Associate Professor and Director of Graduate Studies  
email: [vangardere@missouri.edu](mailto:vangardere@missouri.edu)

## Faculty

**Professor** T. Lewis\*\*, J. Stichter\*\*, M. Stormont\*\*

**Associate Professor** E. Lembke\*\*, R. McCathren\*\*, M. Pullis\*, D. van Garderen\*\*

**Assistant Professor** C. Rose, C. Thomas\*\*

**Professor Emeritus** J. E. Leigh

**Assistant Professor Emeritus** S. Huntze

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 393)
- BSEd in Special Education (p. 393)
  - with emphasis in Cross Categorical Special Education (p. 393)

The requirements for the Bachelor of Science in Education are specified in three areas: University general education, professional education and a teaching major. All students preparing to be teachers in early childhood, elementary, special education, middle or secondary schools, regardless of the major field, are required to complete the University general education program. Students transferring from other institutions are required to fulfill the equivalencies of these courses.

## Graduate

College of Education  
303 Townsend Hall  
573-882-3742  
573-884-0520 (fax)  
<http://education.missouri.edu/SPED/>

**Co-Director of Graduate Studies:**

Michael Pullis, 303 Townsend Hall, 882-3742  
Delinda Van Garderen, 311k Townsend Hall, 884-7075

- MA in Special Education (p. 394)
- MEd in Special Education (p. 394)
- EdSp in Special Education (p. 395) (not accepting applicants at this time)
- EdD in Special Education (p. 395)
- PhD in Special Education (p. 396)

## About Special Education Graduate Programs

We strive to prepare educators to assist children, youth and adults with disabilities to be academically and socially successful life-long learners. Our faculty are consistently recognized — internationally and across the U.S. — for their individual and collaborative teaching and research excellence. The department's unique mix of faculty expertise areas creates a wide range of opportunities for students and researchers. Special Education hosts or co-hosts several state and federally supported training, demonstration and research projects, including the following three centers that focus on facilitating positive developmental outcomes for children and youth with disabilities:

- Center for School-Wide Positive Behavioral Supports
- Center for Adolescent Research in Schools
- Thompson Center for Autism and Neuro-developmental Disorders

## Areas of Study

Students pursuing a master's degree may pursue course work in autism, behavior disorders, early-childhood special education, general special education (cross categorical), gifted education, learning disabilities or learning and instruction.

Doctoral student may study in areas such as administration and supervision of special education, behavior disorders, early-childhood special education, general special education (cross categorical), learning disabilities or developmental disabilities (cognitive impairments).

## Careers

Undergraduate and graduate programs prepare teachers and leadership personnel in the field of special education. Program graduates assume roles as teachers in a variety of educational settings, as consulting teachers, college professors, researchers, school administrators and leaders in state and federal governmental agencies. Programs meet students' needs and interests within the framework of the requirements of each specific degree and state certification guidelines.

## Undergraduate

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## Department Level Requirements - Special Education

The BSEd in Special Education does not contain any departmental requirements.

## BSEd in Special Education

### Major Program Requirements

Students are required to select the emphasis area in Cross Categorical Special Education (p. 393) for this degree. Refer to the emphasis are for degree requirements.

### Semester Plan

For a sample plan of study refer to the semester plan designed for the emphasis in Cross Categorical Special Education (p. 393).

## BSEd in Special Education with Emphasis in Cross Categorical Special Education

### Major Program Requirements

Students must complete all university (p. 17), general education (p. 18), and content requirements, in addition to the degree requirements below.

#### Professional Education 74

Phase I		
LTC 1160	Orientation: Special Education	1
ESC_PS 2010 & ESC_PS 2014	Inquiry Into Learning I and Inquiry into Learning I - Field Experience	4
LTC 2040 & LTC 2044	Inquiring into Schools, Community and Society I and Inquiry into Schools, Community and Society: Field	4
SPC_ED 4300	Introduction to Special Education	3
Phase II		
SPC_ED 4310	Behavioral Management for Exceptional Students	3
SPC_ED 4375 & SPC_ED 4940	Cross Categorical Special Education and Cross-Categorical Special Education: Practicum I	5
LTC 4194	Elementary Education Field Experience I	2
LTC 4211	Essential Literacy: Reading	3
LTC 4300	Learning and Teaching Number and Operation in the Elementary School	3
SPC_ED 4325	Language Development of Exceptional Students	3
SPC_ED 4370	Literacy in Special Education	3
SPC_ED 4380 & SPC_ED 4941	Methods in Cross-Categorical Special Education and Practicum in Cross-Categorical II	7
LTC 4600	Diagnosis and Remediation of Learning Problems in Math - Middle	3
Phase III		
SPC_ED 4320	Assessment and Evaluation in Special Education	3
SPC_ED 4330	Collaboration and Consultation in Special Education	3

SPC_ED 4371	Literacy in Special Education II	3
ED_LPA 4060	Inquiring into Schools, Community and Society II	3
LTC 4971	Internship and Capstone Seminar	4
SPC_ED 4390	Methods in Vocational Education for the Disabled and Disadvantaged	3
SPC_ED 4972 & LTC 4971	Capstone Seminar and Portfolio in Special Education and Internship and Capstone Seminar	11

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

Please meet with an academic advisor to discuss these options.

First Year			
Fall	Credits	Spring	Credits
LTC 1160	1	ENGLISH 1000	3
MATH 1100	3	BIO_SC 1010	3
HIST 1100	3	STAT 1200	3
PSYCH 1000	3	Social/Behavioral Science Elective	3
COMMUN 1200	3	Elective	3
LTC 1200	2		
	15		15
Second Year			
Fall	Credits	Spring	Credits
ESC_PS 2010	3	LTC 2040	3
ESC_PS 2014	1	LTC 2044	1
SPC_ED 4300	3	Writing Intensive	3
GEOG 1100	4	Humanities	3
Art/Music_NM	3	World International	3
Elective	3	Elective	3
	17		16
Third Year			
Fall	Credits	Spring	Credits
LTC 4194	2	LTC 4600	3
LTC 4211	3	SPC_ED 4325	3
LTC 4300	3	SPC_ED 4370	3
SPC_ED 4310	3	SPC_ED 4380	4
SPC_ED 4375	3	SPC_ED 4941	3
SPC_ED 4940	2		
	16		16
Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	LTC 4971	10
LTC 4971	4	SPC_ED 4390	3
SPC_ED 4320	3	SPC_ED 4972	1
SPC_ED 4330	3		

SPC_ED 4371	3		
	16		14
Total Credits: 125			

## Graduate

### MA in Special Education

Special Education Contact (sped@missouri.edu)  
303 Townsend Hall; Columbia, MO 65211  
573-882-3742

#### About Special Education's Master 's Degrees

The Master of Arts program emphasizes research and requires 33 hours. MA candidates must follow graduate school guidelines with respect to timeliness and committee formations and complete a thesis.

The Master of Education program requires 33 hours and a comprehensive examination or project.

#### Admission Criteria

Fall deadline: July 1  
Spring deadline: November 1  
Summer deadline: April 1

Minimum GPA: 3.0/4.0  
Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	60

Minimum preferred GRE scores:

When did you take the GRE?	Verbal + Quantitative
On or After August 1, 2011	291 (V 150 + Q 141) / Analytic Writing 3.5
Prior to August 1, 2011	900

Faculty selection committees review applications for admission into the various graduate programs. Factors considered in the graduate student review process include previous academic course work and performance, GRE scores, letters of recommendation from professors or professional supervisors and relevant professional work experiences. The letter of intent is evaluated for advising purposes and is an indication of the applicant's motivation, professionalism and writing competencies. Interviews with faculty are often arranged as part of the admissions review process.

#### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Special Education Program:

- Departmental application
- Letter of intent and professional goals
- 2 letters of recommendation (form provided by department)
- GRE score report

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

### Degree Completion

The MA program emphasizes research and requires 33 hours. MA candidates must follow Graduate School guidelines with respect to timeliness and committee formations and complete a thesis.

### Retention

To remain in good standing in the master's program and earn a master's degree, each student must earn and maintain an overall grade point of 3.0 or higher in all required and elective course work each semester. If student's GPA falls below 3.0 for any semester, they will be dropped from the degree program. If students receive a grade of "C" in any core or required course, remedial activities will be required. Students must also complete course work assigned a grade of "I" prior to the end of the following semester.

### Satisfactory Progress

For information on general progress guidelines and the dismissal policy, see the Special Education site.

### MEd in Special Education

Special Education Contact (sped@missouri.edu)  
303 Townsend Hall; Columbia, MO 65211  
573-882-3742

#### About Special Education's Master 's Degrees

The Master of Education program requires 33 hours and a comprehensive examination or project.

The Master of Arts program (p. 394) emphasizes research and requires 33 hours. MA candidates must follow graduate school guidelines with respect to timeliness and committee formations and complete a thesis.

#### Admission Criteria

Fall deadline: July 1  
Spring deadline: November 1  
Summer deadline: April 1

Minimum GPA: 3.0/4.0  
Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	60

Minimum preferred GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	900
On or After August 1, 2011	291 (V 150 + Q 141) / Analytic Writing 3.5

Faculty selection committees review applications for admission into the various graduate programs. Factors considered in the graduate

student review process include previous academic course work and performance, GRE scores, letters of recommendation from professors or professional supervisors and relevant professional work experiences. The letter of intent is evaluated for advising purposes and is an indication of the applicant's motivation, professionalism and writing competencies. Interviews with faculty are often arranged as part of the admissions review process.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Special Education Program:*

- Departmental application
- Letter of intent and professional goals
- 2 letters of recommendation (form provided by department)
- GRE score report

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Degree Completion

Maser's candidates must follow Graduate sSchool guidelines with respect to timeliness and committee formations and complete a thesis.

## Retention

To remain in good standing in the master's program and earn a master's degree, each student must earn and maintain an overall grade point of 3.0 or higher in all required and elective course work each semester. If student's GPA falls below 3.0 for any semester, they will be dropped from the degree program. If students receive a grade of "C" in any core or required course, remedial activities will be required. Students must also complete course work assigned a grade of "I" prior to the end of the following semester.

## Satisfactory Progress

For information on general progress guidelines and the dismissal policy, see the Special Education site.

## EdSp in Special Education

Our department is no longer admitting students to the EdS program. We invite you to explore the other graduate degree options within the College of Education.

## EdD in Special Education

### Admission Contact Information

Special Education sped@missouri.edu  
303 Townsend Hall; Columbia, MO 65211  
573-882-3742

### Admission Criteria

Fall deadline: January 15  
Spring deadline: August 15

- Minimum GPA: 3.5/4.0
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)	
80	60	
<ul style="list-style-type: none"> <li>• Minimum preferred GRE scores:</li> </ul>		
When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	
On or After August 1, 2011	297 (V153 + Q144)	4.0

Faculty selection committees review applications for admission into the various graduate programs. Factors considered in the graduate student review process include previous academic course work and performance, GRE scores, letters of recommendation from professors or professional supervisors and relevant professional work experiences. The letter of intent is evaluated for advising purposes and is an indication of the applicant's motivation, professionalism and writing competencies. Interviews with faculty are often arranged as part of the admissions review process.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Special Education Program:*

- Departmental application
- Letter of intent and professional goals
- 3 letters of recommendation (form provided by department)
- GRE score report

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Plan of Study

The EdD program requires 72 hours beyond the requirements of the master's degree.

## Qualifying Exam

Doctoral students must successfully pass a qualifying exam. This is given to assess the student's current knowledge of the field, their ability to synthesize professional literature, engage in professional writing practices, and orally present/discuss key issues within the field. This process is conducted by three faculty members and may be used to help define the student's plan of study.

## Comprehensive Exam and Dissertation

Doctoral students must complete comprehensive exams, which have a written and oral component, which is constructed and evaluated by the student's doctoral committee in order to advance to "candidacy" status. A minimum of six hours of 9090 Research is required for the doctoral program in completion of the dissertation.

## Satisfactory Progress

For information on general progress guidelines and the dismissal policy, see the Special Education site.

## PhD in Special Education

### Admission Contact Information

Special Education Contact (sped@missouri.edu)  
 303 Townsend Hall; Columbia, MO 65211  
 573-882-3742

### Admission Criteria

Fall deadline: January 15  
 Spring deadline: August 15

Minimum GPA: 3.5/4.0  
 Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	60

Minimum preferred GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1000
On or After August 1, 2011	297 (V153 +Q144) / Analytic Writing 4.0

Faculty selection committees review applications for admission into the various graduate programs. Factors considered in the graduate student review process include previous academic course work and performance, GRE scores, letters of recommendation from professors or professional supervisors and relevant professional work experiences. The letter of intent is evaluated for advising purposes and is an indication of the applicant's motivation, professionalism and writing competencies. Interviews with faculty are often arranged as part of the admissions review process.

### Required Application Materials

*To the Graduate School:*  
 All required Graduate School documents

*To the Special Education Program:*  
 Departmental application  
 Letter of intent and professional goals  
 3 letters of recommendation (form provided by department)  
 GRE score report

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

### Emphasis Areas

For the doctorate's specializations, see Degrees Offered.

## Plan of Study

The PhD program requires 72 hours beyond the requirements of the master's degree.

## Qualifying Exam

Doctoral students must successfully pass a qualifying exam. This is given to assess the student's current knowledge of the field, their ability to synthesize professional literature, engage in professional writing practices, and orally present/discuss key issues within the field. This process is conducted by three faculty members and may be used to help define the student's plan of study.

## Comprehensive Exam and Dissertation

Doctoral students must complete comprehensive exams, which have a written and oral component, which is constructed and evaluated by the student's doctoral committee in order to advance to "candidacy" status. A minimum of six hours of 9090 Research is required for the doctoral program in completion of the dissertation.

## Satisfactory Progress

For information on general progress guidelines and the dismissal policy, see the Special Education site.

## Additional Minors and Certificates - Education

### Undergraduate

### Graduate

- Certificate in Education Policy (p. 397)
- Certificate in Higher and Continuing Education Administration (p. 397)
- Certificate in Multicultural Education (p. 398)
- Minor in Multicultural Psychology (p. 398)
- Certificate in Online Educator (p. 399)
- Certificate in Teaching English to Speakers of Other Languages (p. 399)

## Graduate

### Graduate Certificate in Education Policy

**\*Federal Gainful Employment Disclosure in the back of this catalog.**

#### Contact Information

Educational Leadership and Policy Analysis  
202 Hill Hall  
573-882-8221

[http://education.missouri.edu/ELPA/program\\_areas/degree\\_pages/policy\\_studies\\_certificate.php](http://education.missouri.edu/ELPA/program_areas/degree_pages/policy_studies_certificate.php)

The importance of education policy in U.S. society is evident in the attention it receives from scholars, politicians, media pundits, and citizens. Because nearly all citizens attend school for some part of their lives, they have ideas about what schools should accomplish and how they should be run. Education policy receives a great deal of attention from policy makers at all levels and in all branches of government.

Economically, public education (pre-K through higher education) constitutes a major part of the states' budgets, and a significant local investment as well. In addition, researchers gain new perspectives by comparing U.S. public schools with the private sector, which provides education to a significant number of students in many locales, as well as with schools in other nations. In academe, the study of education policy is an interdisciplinary endeavor, involving scholars from philosophy, political science, economics, sociology, history, public administration, journalism, and other fields.

The graduate certificate in Education Policy gives students access to a coherent set of courses that will enable them to understand this complexity. The certificate provides students with:

- Knowledge they can apply to the study of education policy within their major discipline or to their work in policy settings.
- Skills in analyzing education policy issues, i.e., understanding differing values, political and economic arguments, costs/benefits, and policy processes.
- Conceptual tools to use in understanding and resolving policy implementation problems.

#### Required Courses

Nine semester hours/three courses

ED_LPA 7458	Sociology of Education	3
ED_LPA 9460	Philosophic Theory in Education	3
ED_LPA 9462	History of U.S. Education Policy	3

#### Elective Course

Three semester hours/one course, select one of the following: 3

ED_LPA 9459	Comparative and International Education	
ED_LPA 9463	Politics of Education	
ED_LPA 9465	Policy Analysis Using Large Data Bases	

Total Credits 12

Applications accepted anytime. For more information about this graduate certificate, contact the ELPA Department by phone at 573-882-8221 or by e-mail at [elpagrad@missouri.edu](mailto:elpagrad@missouri.edu)

### Graduate Certificate in Higher and Continuing Education Administration

#### Contact Information

Department of Educational Leadership and Policy Analysis  
202 Hill Hall  
573-882-8221  
[http://education.missouri.edu/ELPA/program\\_areas/degree\\_pages/HACE\\_certificate.php](http://education.missouri.edu/ELPA/program_areas/degree_pages/HACE_certificate.php)

Due to multiple and growing demands upon the academy for quality control, accountability, and productivity, administration of higher education has become increasingly complex. The Graduate Certificate in Higher Education Administration is designed to address the need for enhanced understanding of the higher education institutional context and for improved skills in areas required for effective administration of the higher education enterprise.

The Graduate Certificate in Higher Education Administration is designed to provide students with an overview of higher education administration and governance, and with some technical knowledge about various aspects of administration, e.g., finance, law, policy.

#### Required Courses

Six semester hours/two courses

ED_LPA 9450	Administration and Governance of Higher Education	3
ED_LPA 9451	Higher Education Finance	3

#### Elective Courses

Six semester hours/two courses, select two of the following: 6

ED_LPA 9444	Program Planning in Higher Education	
ED_LPA 9446	Student Affairs Administration	
ED_LPA 9447	College Student Culture and Environment	
ED_LPA 9449	History of Higher Education in the United States	
ED_LPA 9452	Overview of Higher Education	
ED_LPA 9454	Introduction to Post-Secondary Law	
ED_LPA 9455	The Community College	

ED\_LPA 9457 Higher Education Policy

Total Credits 12

For more information about this graduate certificate, contact the ELPA Department by phone at 573-882-8221 or by e-mail at [elpagrad@missouri.edu](mailto:elpagrad@missouri.edu).

## Graduate Certificate in Multicultural Education

This certificate will provide the requisite awareness, knowledge and skill to effectively work with students and families from diverse cultural backgrounds and is ideal for teachers, counselors and administrators in P-12 school settings. By creating this online certificate, Mizzou is working to increase the number of qualified teachers and other school personnel who can serve diverse populations and prepare all students to function more effectively in society. The 15-hour certificate can be completed entirely online, but some students may choose electives that are offered on campus in Columbia, Mo.

Certificate web site: <http://mudirect.missouri.edu/degprog/ed-multicultural/>

For information about certificate, contact:

Dr. Puncy Heppner  
[heppnerp@missouri.edu](mailto:heppnerp@missouri.edu)  
 573-882-3523  
 16 Hill Hall

## Graduate Minor in Multicultural Psychology

As we enter the new millennium, the U.S. population is becoming more multiracial, multiethnic, and multilingual. Some estimate that by the year 2020, racial and ethnic minorities will become the numerical majority. This demographic shift has already occurred in specific contexts, such as K-12 schools in Los Angeles. Applied psychologists and educators have begun to develop competency standards for professionals to provide culturally relevant and effective services to our ever-changing population. In fact, multiculturalism has been identified as the fourth focus in counseling psychology. The purpose of the graduate minor in multicultural psychology and education would be to (a) expose graduate students to the growing theoretical and empirical research completed in the fields of multicultural psychology and education, (b) help graduate students develop multicultural competencies in research and practice, and (c) provide graduate students with training necessary to meet the psychological and educational demands of diverse populations.

**The requirements for the minor are listed below.**

- A minimum of 12 credit hours
- 9 credit hours must be taken as a graduate student at the University of Missouri
- No more than 6 credit hours should be listed in the masters or doctoral planner. That is, a maximum of 6 hours can overlap between the courses applied to the Minor in Multicultural Psychology and the courses applied toward a masters or doctoral degree.
- A minimum of 9 credit hours must be 8000 or above (graduate level)
- 6 credit hours must be taken within the core area with a foci on racial and ethnic minorities (see listing below)

- 3 credit hours must be taken in the auxiliary area (see listing below)
- 3 credit hours must be taken in the skills area (see listing below)

**Core Courses**

Must complete at least 6 credit hours from the following courses with a main emphasis on race/ethnicity in psychology and/or education

ESC_PS 8580	Social and Cultural Identity Development	3
ESC_PS 8590	Multicultural Counseling Competencies: Theory and Research	3
ESC_PS 9000	Multicultural Issues in Counseling	3

Other racial/ethnic-focused graduate level courses in other departments, with pre-approval.

**Auxiliary Courses**

Must complete 3 credit hours from the following courses emphasizing a wide range of diversity and social change issues.

ESC_PS 8585	Gender Issues in Counseling and Education	3
ESC_PS 8990	Career Development Theory for Women	3
ESC_PS 8510	Medical and Psychological Aspects of Disability	3
ESC_PS 8540	Theory and Practice in Feminist Therapy	3

Other diversity issues and inequality in social systems graduate level courses in other departments, with pre-approval.

**Skill Courses**

Must complete 3 credit hours from one of the options below.

I. Research Skills \*

ESC_PS 8090	Master's Thesis in Educational, School, and Counseling Psychology
ESC_PS 9090	Doctoral Dissertation Educational School & Counseling Psychology

II. Applied Multicultural Skills ^

ESC_PS 8943	Practicum in Multicultural Counseling Interventions
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Pre-approved Multiculturally-designated applied course (e.g. counseling practica, teaching practica, group counseling practica)

Applied experience via community outreach programs, work placements in agencies, or extended volunteer experiences in community agencies.

Multicultural Competency Portfolio to demonstrate awareness, knowledge and skill competencies, as approved by a Center Director.

Consultation courses in organization or systemic changes including applied consultation activities, as pre-approved by a Center Director.

\* The scope and quality of the research project is expected to be of such a caliber that it could be submitted to a refereed journal in the student's discipline. The research project must be on a multicultural-related topic (i.e. issues related to race, sexual orientation, gender, and international concerns). Successful completion of this requirement will consist of approval of the project from a Director of the Center for Multicultural Research, Training and Consultation, or have an ESCP faculty affiliated with the Center on the committee with at least one committee member having expertise in multicultural issues.

^ The person must demonstrate competencies in working with diverse populations (with an emphasis on racial and ethnic minority populations).

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## Graduate Certificate in Online Educator

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Columbia, MO 65211

The Online Educator Graduate Certificate Program will equip individuals with the knowledge and skills needed to design and provide effective online learning experiences including:

- Designing online learning activities and assessments for meaningful learning
- Designing, facilitating, and evaluating online discussions
- Promoting student engagement and motivation in online learning environments
- Understanding unique characteristics of online learning environments
- Selecting appropriate technology tools and learning objects to support online learners
- Using Learning Management Systems to support and deliver online learning
- Seeking for and evaluating Internet-based information and resources that can be used to enhance online learning
- Organizing course materials in an online format

Certificate web site: <http://edtech.missouri.edu/oe>

For information about certificate, contact:

SISLT Student Services Coordinator  
304 Townsend Hall  
Columbia, MO 65211  
[sislt@missouri.edu](mailto:sisl@missouri.edu)  
phone: 877-747-5868 or 573-882-4546

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## Graduate Certificate in Teaching English to Speakers of Other Languages

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The Graduate Certificate in Teaching English to Speakers of Other Languages (TESOL) prepares English language teachers, English language program administrators, language testers, and educational materials writers to work in contexts where English is a foreign language (EFL contexts). The objectives of the certificate are to develop professionals with a) knowledge of the structure of the English language; b) an understanding of how languages are used and learned; and c) skills in designing and implementing pedagogical tasks to facilitate language learning. The certificate consists of 18 graduate credit hours divided among five core courses and one elective course.

Certificate web site: <http://online.missouri.edu/degreeprograms/ed-tesol/gradcertificate.aspx>

For information about certificate, contact:

Dr. Nikki Ashcraft  
[ashcraftn@missouri.edu](mailto:ashcraftn@missouri.edu)  
573-882-8394

Dr. Rachel Pinnow  
[pinnowr@missouri.edu](mailto:pinnowr@missouri.edu)  
573-882-8465

Address:

Learning, Teaching and Curriculum  
303 Townsend Hall  
University of Missouri

## College of Engineering

### Administration

James E. Thompson, Dean  
W1025 Lafferre Hall  
(573) 882 4375  
thompsonje@missouri.edu

When engineering classes at the University of Missouri began in 1849, a strong tradition was born that continues to grow. Today, the College of Engineering includes the first electrical engineering department established west of the Mississippi River and the only industrial engineering program in Missouri. The college offers fully accredited degree programs in biological, chemical, civil, computer, electrical, industrial and mechanical engineering, along with computer science and information technology. All programs offer both undergraduate and graduate degrees. Naval Science is under the academic administration of the college as well. The hallmark of the College of Engineering is excellence in teaching and scholarly pursuits.

### Mission

The College of Engineering will continuously improve the quality of its primary areas of responsibility—teaching, research and service. In so doing, the College:

- Provides engineering students and practicing professionals with the expertise and new knowledge required to solve society's complex technological problems
- Develops and utilizes enabling technologies for teaching, research, service and outreach
- Prepares students and practicing professionals to compete in a global economy
- Instills students with a commitment to life-long learning

### Undergraduate

- Admissions
- Graduation Requirements
- Academic Regulations
- Student Services

### Admissions

#### Direct Freshman Admission to Engineering

Entering freshmen are expected to have completed 17 units of approved high school course work (in grades 9-12), including 4 units in English, 4 in mathematics and 3 in science with laboratory. Mathematics should include 2 units of algebra, 1 unit of plane and solid geometry (combination course), and 1/2 unit of trigonometry. Additional senior mathematics is recommended.

For direct admission to the College of Engineering, the applicant must meet the qualifications listed below (these numbers are subject to change).

- ACT-Math of at least 24 AND
- ACT-Composite of at least 24 OR high school class rank in the upper 25 percent

The average ACT scores for first-time freshmen admitted to the College of Engineering for fall 2011 were ACT-Composite 28.1, ACT-Math 28.5 and ACT-English 27.4.

### Pre-Engineering Program (PEP)

Freshmen who do not meet the criteria for direct admission to the College of Engineering are admitted initially into the Pre-Engineering Program. Although admitted to the College of Arts and Science, each PEP student receives advising by an engineering advisor.

PEP reduces freshman pressures while preserving alternatives. Because PEP students are enrolled in the College of Arts and Science, degree options in the College of Arts and Science are available to those who may decide to change their focus from engineering.

Most first-semester PEP students enroll in one preparatory math course and three courses in the College of Arts and Science, which count in both the engineering and arts and science degree programs. The prime objective is to strengthen math preparation sufficiently for success in engineering.

PEP students are eligible to transfer to the College of Engineering when they meet the following requirements:

- Satisfactory completion of 24 credits
- GPA of 2.0 or higher both Cumulative and last graded term
- A grade of C- or better in MATH 1500 Analytic Geometry and Calculus I or, for Information Technology students, MATH 1400 Calculus for Social and Life Sciences I
- Academic good standing

### Declared and Undeclared Status

Freshmen engineering students may start with a departmental affiliation or with an undeclared status and defer the selection of a particular department for the first 2-3 semesters. Those choosing the latter route are assigned to special faculty advisors.

Undeclared students should discuss course selection with the academic advisor each semester to keep options open among departmental curricula.

It also is possible to transfer from one department to another during the early part of the curriculum. Students who transfer must satisfy the specific degree requirements of the new department.

### Engineering Dean's Scholars Program

The purpose of the Engineering Dean's Scholars Program is to recognize, mentor and train the highest-achieving students in scholarship and leadership. Engineering Dean's Scholars participate in the Engineering Scholars Freshman Interest Group (FIG) which will be housed in Hudson or Gillett Residence Hall. Faculty-scholar lunches are held several times during the semester to allow the scholars to meet with engineering faculty and to learn about the engineering profession and undergraduate research opportunities.

Scholars participate in leadership or mentoring activities during their sophomore, junior and senior years. Examples of such activities include serving as engineering ambassadors or peer advisors for an engineering FIG. Students chosen for peer advisor positions have their room and board covered in exchange for their services.

Engineering Dean's Scholars are awarded a \$1000 scholarship in addition to the \$2000 Engineering Achievement Award and any other scholarships awarded. The Dean's Scholarship is renewable for up



to eight semesters with 3.5 cumulative GPA at the end of each spring semester.

Students who have ACT math and composite scores of 32 and a high school rank in the top 10 percent of their class will be sent applications upon admission. Students who are close to these criteria may request an application by contacting the engineering dean's office at the address below. Consideration of students who do not meet the suggested minimum criteria will be contingent upon available space in the program. Applications are due February 1st.

Mizzou Engineering Dean's Scholars Program  
 W1025 Lafferre Hall  
 University of Missouri  
 Columbia, MO 65211  
 (573) 882-4092

## Transfer Students

Students wishing to transfer to MU from an accredited college or university are subject to University regulations described in this catalog.

The MU College of Engineering cooperates with many colleges through articulation agreements that help pre-engineering students transfer to MU with maximum ease and minimum loss of credits. A student may take the first two years at the participating school and then transfer to MU for the junior and senior years in engineering. After the program is completed, the student is awarded a BS degree in the chosen engineering field.

To be recommended for the BS degree from the College of Engineering, a student transferring from an accredited institution must complete at least 30 upper-level credits in the degree program at a UM System campus. At least 21 of the 30 credits must be upper-level engineering courses approved by the department awarding the degree.

A student transferring with senior standing from another UM System campus must complete the last 15 credits in residence on the campus where the degree program is located. Twelve of these 15 credits must be in engineering and approved by the department awarding the degree.

Any student whose enrollment in any college-level academic program resulted in dismissal, departure or who are on probation will not be admitted to the College of Engineering

## International Admission

Admission of international students is determined on an individual basis by a committee of representatives from the Admissions Office and the College of Engineering.

Before registering for classes at the University, international students must take the MU English Language Test, developed for international students. Students passing the test are eligible to take ENGLSH 1000 and any other required English courses.

International students whose test scores indicate that additional English training is needed, including those with transferred English credit, are required to register for an English-language support class. The course, developed for international students, should be taken during the first semester of enrollment. This course does not count toward graduation credit, but regular attendance is required and failure to attend will result in dismissal. The English-language support class taken must be satisfactorily completed before the student can enroll in ENGLSH 1000. Students not satisfactorily completing the class in the first semester of enrollment must re-enroll in the second semester. If the student does not satisfactorily complete the English-language support class in the second

term of enrollment, the student will not be permitted to re-enroll in the College of Engineering.

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## Graduation Requirements

The curriculum provides a solid foundation of mathematics and physical sciences followed by the application of these sciences in engineering specialties. The balance of the curriculum encompasses communication skills, English, social sciences and humanities courses.

Many freshmen are eligible to start with calculus. However, some can profit from additional pre-calculus preparation, which is an addition to the undergraduate curricula.

Students should access the engineering web site (<http://engineering.missouri.edu>) for details regarding social and behavioral sciences and humanities and fine arts requirements.

In addition to the University's general education and graduation requirements, the departments in the College of Engineering may require further specific courses to better equip students to perform in their chosen fields of study.

While many students complete the BS degree program in four years, some may find it advisable to extend the curriculum in order to carry lighter semester loads, add preparatory courses or compensate for part-time work.

## GPA Requirements for Graduation from the College of Engineering

- GPA of record of at least 2.0
- GPA of at least 2.0 in all engineering courses offered by one of the four campuses of the UM System. "Engineering courses" include all courses that are offered through the College of Engineering or its equivalent on the four campuses, or that have "Engineering" in the curricular designator. Only the last grade in a repeated course will be used in the calculation.

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## Academic Regulations

### Degree with Honors Requirements

Latin Honors are granted to students who meet the following cumulative GPA requirements:

Latin Honor	GPA
summa cum laude	3.9
magna cum laude	3.7
cum laude	3.5

### Departmental Honors

The college maintains an undergraduate honors program to further challenge those who have established a minimum GPA of 3.0 at the beginning of the junior year. A comparable grade point average is required of transfer students. The program leads to an undergraduate honors thesis on a research or advanced design project, provides for additional curricula flexibility and contains features that ease the transition to graduate school.

Opportunities available to honors students include:

- More personal attention from an honors advisor
- Independent study or undergraduate research with a senior faculty member whose specialty interests the honors candidate

A student who successfully completes the engineering honors program, including the independent project, will be designated an "Honors Scholar in Engineering." Interested students should contact their departmental office.

Qualified engineering students are also welcome to join the programs of the Honors College and may enroll in various honors courses and honors sections of regular courses.

## Courses in Basic Skills

No basic skills courses may be taken to fulfill graduation requirements.

## Curriculum of Record

The curriculum of record is the curriculum a student must satisfy to meet graduation requirements. For students who maintain continuous, full-time enrollment, the curriculum of record is the one approved by the College of Engineering at the time the student achieves upper-division status in the discipline of choice. For others, the curriculum of record is decided by the department faculty.

## Academic Probation and Dismissal

1. A student whose term and cumulative UM GPA are 2.0 or higher is in good academic standing. A "term" is defined as a semester or summer session.
2. A student will be placed on academic probation if while in good academic standing the student has a term GPA less than 2.0 but equal to or greater than 1.0.
  - While on academic probation, a student must enroll in and complete each semester at MU at least 12 credits of course work necessary for the degree. Courses taken through MU's Mizzou Online (self-paced) count as part of these 12 credits. Part-time students must enroll in at least as many credits each semester as the college rules governing part time enrollment.
  - A student will be removed from probation at the end of the term when the term and cumulative GPA are 2.0 or higher, provided the student completed 12 or more hours applicable toward the degree
  - A student will be continued on probation if while on probation the student has a term GPA greater than or equal to 2.0, but whose cumulative GPA is below 2.0.
3. A student will be dismissed from the College of Engineering if the student:
  - Receives a term GPA of less than 1.0
  - Receives a term GPA of less than 2.0 while on probation.
  - Fails to complete at least 12 credit hours toward their Engineering degree program while on academic probation.
4. Readmission:
  - If the appeals committee allows a student to re-enroll, it may set conditions such as courses to be taken, minimum grades, total hours, etc to which the student must adhere.
  - A student who has been dismissed for academic reasons may be readmitted upon a successful appeal to the academic appeals committee of the college. Students who are subject to dismissal

(IE) and who wish to appeal their case for continuation must write an appeal letter and submit it to the academic appeals committee.

- Similarly, students who wish to re-enroll in the college of Engineering after having been out of school as a result of a dismissal must write a letter of appeal to the College of Engineering academic appeals committee requesting readmission.
  - Letter of appeal may be addressed to: Engineering Academic Appeals Committee, W1025 Lafferre Hall, University of Missouri, Columbia, MO 65211. A personal visit with the director of undergraduate studies of the students department and advisor before appealing by letter is often helpful, both to the student and to the committee.
  - The primary concern of the appeals committee is the likelihood of future success. Accordingly, any appeal should include an explanation for past poor performance and reason for expecting better in the future.
5. A student who has been twice dismissed will normally be ineligible for readmission.

## Satisfactory/Unsatisfactory Grading Option

Under Satisfactory/Unsatisfactory (S/U) grading, an S is assigned for a grade in the A, B or C range, and a U is assigned for a grade in the D range or for an F. Neither an S nor a U will be calculated into a student's grade point average. A student enrolled in the College of Engineering may not take any math, science or engineering course that counts toward degree requirements under the S/U grading option, unless the course is only offered S/U. In addition, any course specifically required (by course number) in the curriculum may not be taken S/U. This includes ENGLSH 1000 or ENGLSH 1000H. The 18 credits taken to fulfill the University general education distribution requirement may be taken S/U.

## Restrictions

- First-semester freshmen are ineligible to take any course S/U unless it is only offered S/U.
- Only one course per semester may be taken S/U.
- Students on academic probation are not allowed to take any course S/U.
- To be eligible for the Dean's List each term, a student must complete 12 graded credits (S/U courses are not considered "graded").

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## Student Services

### Advising

Each student in the College of Engineering is assigned an advisor who assists the student in reaching academic and professional goals. Students are encouraged to meet with their advisors as often as needed. Engineering students have advising holds placed on their accounts each semester and must meet with their advisor to have the hold lifted in order to enroll each semester.

### Diversity in Engineering Program

The Diversity in Engineering Program (DEP) supports increased enrollment and graduation rates among students from underrepresented minority groups in the College of Engineering. The DEP office provides

student programming designed to create a user-friendly environment for students pursuing a degree in engineering from the University of Missouri. This effort includes models for successful outreach, recruitment, early research experience, counseling, undergraduate retention, academic enrichment, mentoring and information about graduate study.

DEP provides a support network between students, faculty, and staff to ensure academic success through programming ranging from free tutoring to time management and study skills sessions. Career information sessions, resume review, and mock interviews are also provided to ensure professional preparedness. DEP also offers outreach opportunities for students to interact with the local community that include tutoring, mentoring, and giving presentations to local elementary, junior high and high school students.

## Learning Communities

The college cosponsors several living/learning options for engineering students. The college believes that an environment conducive to the formation of networks, with aspects of social and academic interaction, enhances the retention and ultimate success of students in the engineering curriculum. Students selecting these options generally earn higher grades and are more likely to graduate than the average engineering student.

The Engineering Learning Community (ELC) is a special co-ed environment that offers engineering majors a full range of academic support and activities. ELC allows engineering students to live together, study together and have fun together. Freshman Interest Groups (FIGs) support incoming freshmen. Members of a FIG are co-enrolled in three courses during the first semester of the freshman year with a group of up to 20 students. Each community has its own computer lab, peer tutors, study groups and quiet hours.

## Professional Engineering Registration

The revised statutes of Missouri (Section 327.221) require that each applicant for registration as a professional engineer in Missouri must be a graduate of and hold a degree in engineering in a curriculum accredited by the Accreditation Board for Engineering and Technology. The MU undergraduate programs in biological, chemical, civil, computer, electrical, industrial and mechanical engineering, and computer science at MU are so accredited.

Senior students are strongly encouraged to take the Fundamentals of Engineering Exam leading to the Fundamentals in Engineering (FE) status as a first step toward registration.

The MU undergraduate programs in biological, chemical, civil, computer, electrical, industrial and mechanical engineering, and computer science are accredited by the Engineering Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>).

## Naval Reserve Officers Training Corps (NROTC)

NROTC was established in 1926 to offer college students the necessary naval science courses to qualify for commissions in the Navy or Marine Corps Reserve. Today, NROTC is one of the primary accession sources of officers for the Navy and Marine Corps.

Scholarship NROTC midshipmen incur no military obligation during their freshman year. This allows students to get a better understanding and appreciation of the life of a Navy or Marine Corps officer. Navy NROTC graduates incur a minimum five years military obligation. Marine NROTC

graduates incur a minimum four year military obligation. The two-year NROTC program is designed for transfer students and for MU students who did not participate in NROTC during the first two years. MU also offers a Minor in Naval Science (p. 463).

Navy students should major in a technical course of study while marine students may major in any course of study leading to a baccalaureate degree. Academic credit for naval science courses is accepted toward a baccalaureate degree by most MU schools and colleges. Midshipmen take one naval science course for credit each semester, which provides education and training in various aspects of the Navy or Marine Corps. Associated with each course is a leadership laboratory. NROTC activities include water survival, self-defense, physical fitness, orienteering, aviation, nuclear power indoctrination, pistol/rifle marksmanship and a variety of field trips. Upon graduation, midshipmen are commissioned as Ensigns in the Navy or Second Lieutenants in the Marine Corps.

For additional information, contact:

Department of Naval Science  
105 Crowder Hall  
573-882-6693 or 888-686-7682  
NROTC@missouri.edu  
<http://nrotc.missouri.edu/>

## Graduate

The University of Missouri began offering engineering classes in 1849. By 1877, a College of Engineering was established and by the 1890's, students could pursue master's and doctoral degrees. Today, the College offers graduate degrees in nine disciplines to 500+ domestic and international students.

Graduate engineering programs include

- Biological Engineering
- Chemical Engineering
- Civil & Environmental Engineering
- Computer Science
- Electrical & Computer Engineering
- Industrial Manufacturing & Systems Engineering
- Information Technology
- Mechanical & Aerospace Engineering
- MU Informatics Institute
- Nuclear Engineering

Mizzou engineering sustains a variety of research centers, programs, groups and facilities along with other departmental groups that are designated as areas of exemplary expertise and success. The college contributes significantly to MU's overall annual research and development spending. The College also offers exceptional business opportunities to corporations, small businesses and start-ups.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Biological Engineering

J. Tan, Chair  
College of Engineering  
College of Agriculture, Food and Natural Resources  
215 Agricultural Engineering Building  
(573) 882-7044  
TanJ@missouri.edu

Recognizing the immense promise of bioengineering and the unique position of Mizzou for a strong bioengineering program, the College of Agriculture, Food and Natural Resources (CAFNR) and the College of Engineering (CoE) joined forces to form the department of Biological Engineering (BE).

Biological Engineering unites existing faculty and infrastructure from both colleges. CoE contributes biomedical engineering capabilities while CAFNR brings strengths in bioprocess and bioenvironmental engineering.

### Faculty

#### Primary Faculty

**Professors** K. D. Gillis\*\*, S. A. Grant\*\*, F. H. Hsieh\*\*, J. Tan\*\*  
**Associate Professors** S. C. Borgelt\*, L. Gu\*\*, W. A. Jacoby\*\*, R. Kannan\*\*, J. C. M. Lee\*\*, A. L. Thompson\*\*, J. Viator\*\*, G. Yao\*\*  
**Assistant Professors** S. Ding\*\*, H. Hunt\*, F. M. Pfeiffer\*, S. Sengupta\*\*

#### Affiliated Faculty

**Professors** D. Brune\*\*, C. S. Cutler\*, M. Davis\*\*, M. W. Downs\*, G. Forgacs\*\*, S. Gangopadhyay\*\*, M. Hill\*\*, T. Hwang\*\*, K. V. Katti\*\*, A. McClellan\*\*, G. Meininger\*\*, S. Nair\*\*, E. J. Sadler\*, L. G. Schumacher\*, S. Segal\*, K. A. Sudduth\*\*, G. Suppes\*, E. Vories\*  
**Associate Professors** D. E. Baker\*, J. W. Kwon\*, H. Li\*  
**Assistant Professors** M. Bernards\*, A. Bulent Koc\*\*, P. V. Cornish\*\*, T. T. Lim\*, L. A. Martinez-Lemus\*\*, L. Polo-Parada\*\*, R. A. White\*, J. Zulovich\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 405)
- BSBE in Biological Engineering (p. 405)

#### Advising and Scholarship Contact

Steve Borgelt, Undergraduate Director  
254 Agricultural Engineering Building  
(573) 882-7044  
BorgeltS@missouri.edu

Biological engineering is a science-based engineering discipline that integrates engineering and biological sciences in one curriculum. The MU biological engineering program is a broadly-based curriculum that prepares students for careers in three areas:

- Biomedical engineering (including pre-medicine)

- Bioprocess engineering
- Bioenvironmental engineering

Biological engineering graduates are hired by biotechnology, medical, pharmaceutical, food and agricultural companies, and by government agencies. Some attend graduate and medical schools. Graduates are well prepared to take the Fundamentals of Engineering exam during their senior year, which is the first step toward obtaining a Professional Engineer license.

The Bachelor of Science with a major in Biological Engineering (BS BE) program at MU is accredited by the Engineering Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>). The biological engineering curriculum was developed to meet the mission, program objectives and student outcomes described below.

### Mission and Objectives

The department mission is to educate biological engineers to integrate engineering and biological sciences in the contexts of health, sustainability and environmental stewardship, thus preparing them for productive careers characterized by continual professional growth.

### Program Educational Objectives

The undergraduate program leads to a Bachelor of Science degree in Biological Engineering, producing graduates who will, within 3-5 years:

1. Show proficiency in engineering analysis, design and development.
2. Interact effectively with life science and other professionals.
3. Integrate biological and engineering sciences for the design and development of innovative systems and processes for improved health, bio-resource utilization, and environmental protection.
4. Exhibit professionalism as they continually add value to their chosen field of endeavor.
5. Succeed in advanced study in engineering, medicine or veterinary medicine, if pursued.

### Student Outcomes

By the time of graduation, Biological Engineering students will possess:

- a. An ability to apply knowledge of mathematics, science and engineering;
- b. An ability to design and conduct experiments, as well as to analyze and interpret data;
- c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- d. An ability to function on multi-disciplinary teams;
- e. An ability to identify, formulate and solve engineering problems;
- f. An understanding of professional and ethical responsibility;
- g. An ability to communicate effectively;
- h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- i. A recognition of the need for, and an ability to engage in, life-long learning;

- j. A knowledge of contemporary issues;
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
- l. An ability to integrate engineering and biological sciences to develop systems and processes for improved health, bio-resource utilization, and environmental protection.

## Exploratory Course

Students who want to learn more about the field should take BIOL\_EN 1000 Introduction to Biological Engineering.

## Graduate

Department of Biological Engineering  
 256 William Stringer Wing  
 Columbia, MO 65211-5160  
 573-882-4113  
<http://bioengineering.missouri.edu/>

**Director of Graduate Studies:** Fu-hung Hsieh

- MS in Biological Engineering (p. 406)
- PhD in Biological Engineering (p. 407)

## About Biological Engineering

Recognizing the immense promise of bioengineering and the unique position of MU for a strong bioengineering program, the College of Agriculture, Food and Natural Resources (CAFNR) and the College of Engineering (CoE) joined forces to form the Department of Biological Engineering (BE). BE unites existing faculty and infrastructure from both colleges. CoE contributes biomedical engineering capabilities while CAFNR brings strengths in bioprocess and bioenvironmental engineering. Biological engineering confers both masters and doctoral degrees to students who satisfy the general requirements of the Graduate School and the specific requirements for the masters degree and the doctoral degree of the Department of Biological Engineering.

## Master in Engineering

A student may also choose to complete a Master of Engineering (p. 442) degree with a focus in Biological Engineering. See the Master of Engineering page for requirements (p. 442).

## Thesis Research and Funding

Research assistantships are available to qualified graduate students. Thesis research may emphasize bioprocessing, biomedical engineering, environmental engineering or precision agriculture. Laboratories are well equipped for research in biomaterials, biomedical optics, bioprocessing, biosensors, computer vision, electrophysiology, food extrusion, properties of biological and food materials, process control, GIS, precision agriculture, water quality, wetlands, chemical application technology, soil physics, hydrology and renewable energy.

## Undergraduate

## Department Level Requirements - Biological Engineering

The Department of Biological Engineering has no department level requirements. All requirements are specific to the BSBE in Biological Engineering. Please see this section (p. 405) for further details.

## BSBE in Biological Engineering

### Major Program Requirements

The curriculum encompasses basic sciences, social and behavioral sciences, humanities and fine arts, engineering sciences and topics, and program core courses. The core courses cover topics of biological engineering principles and design. In a capstone design course, each student completes a design project under the direction of a faculty advisor. Technical electives allow students to place emphasis on biomedical, bioprocess or bioenvironmental engineering. The requirements listed below are in addition to University general education (p. 18) requirements.

### Major Core Requirements

<b>Math and Statistics</b>		19
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4100	Differential Equations	3
Statistics (from approved list)		3
<b>Basic sciences</b>		29
PHYSCS 2750	University Physics I	5
PHYSCS 2760	University Physics II	5
CHEM 1320	College Chemistry I	4
CHEM 2100	Organic Chemistry I	3
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
Biology and related science (from approved list)		8
<b>Basic Engineering</b>		14
ENGINR 1100	Engineering Graphics Fundamentals	2
ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2200	Intermediate Strength of Materials	3
Fluid Mechanics (from approved list)		3
Thermodynamics (from approved list)		3
<b>Biological Engineering</b>		19
BIOL_EN 1000	Introduction to Biological Engineering	1
BIOL_EN 2000	Professional Development in Engineering	2
BIOL_EN 2080	Introduction to Programming for Engineers	3
BIOL_EN 2180	Engineering Analysis of Bioprocesses	3
BIOL_EN 3180	Heat and Mass Transfer in Biological Systems	3
BIOL_EN 4380	Applied Electronic Instrumentation	4
BIOL_EN 4980	Biological Engineering Design	3
<b>Technical electives</b>		24
Upper-level engineering courses with 12 credits in a technical emphasis.		24

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
BIOL_EN 1000	1	ENGLISH 1000	3
MATH 1500	5	MATH 1700	5
CHEM 1320	4	BIO_SC 1500	5
ENGINR 1100	2	ECONOM 1014	3
American History or American Government	3		
	15		16
Second Year			
Fall	Credits	Spring	Credits
BIOL_EN 2080	3	BIOL_EN 2000	2
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	PHYSICS 2760	5
CHEM 2100	3	ENGINR 1200	3
Behavioral or Social Science Course	3	Humanities/Fine Art Course	3
	17		16
Third Year			
Fall	Credits	Spring	Credits
BIOL_EN 2180	3	BIOL_EN 3180	3
Thermodynamics	3	ENGINR 2200	3
Fluid Mechanics	3	Biological Sciences Elective	4
Technical Electives	3	Humanities/Fine Arts Course	3
Biological Sciences Elective	4	Statistics	3
	16		16
Fourth Year			
Fall	Credits	Spring	Credits
BIOL_EN 4980	3	BIOL_EN 4380	4
Technical Elective	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Humanities/Fine Arts Course	3	Technical Elective	3
	15		16
Total Credits: 127			

## Graduate

### MS in Biological Engineering

#### Admission Contact Information

JoAnn Lewis (lewisj@missouri.edu)  
 256 William Stringer Wing  
 Columbia, MO 65211-5160  
 573-882-4113

## Admission Criteria

- Fall deadline: N/A
- Minimum GPA: 3.0 in the last 60 hours
- BS in engineering from an accredited university or equivalent experience
- Minimum Academic IELTS score:

Item	Score
OVERALL	6.0

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	4.0
On or After August 1, 2011	301	4.0

## Required Application Materials

Prospective students first contact JoAnn Lewis in the BE department to receive instructions on the documents needed for a complete application packet.

*To the Graduate School:*

- All required Graduate School documents
- Official transcripts
- TOEFL scores
- GRE scores

*To the Master's BE Program:*

JoAnn Lewis (lewisj@missouri.edu)  
 256 William Stringer Wing  
 Columbia, MO 65211-5160  
 573-882-4113

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Graduation Requirements: Master of Science and Master of Engineering in Biological Engineering

Students without a BS in engineering will be required to complete additional courses in mathematics, basic sciences and engineering science. Students with engineering degrees other than biological engineering should meet certain proficiency requirements.

The Biological Engineering Program requires a minimum of 36 semester hours beyond the baccalaureate degree for the ME and MS non-thesis (MSNT) degrees and a minimum of 30 semester hours for the MS thesis (MST) degree. If approved by the student's Master's Program Committee, this may include up to six hours of graduate credit transferred from another university or from another campus of the MU system.

In general, the Graduate School does not accept correspondence or extension course credit earned at any other campus. However, a student may take up to eight hours of correspondence courses that are authorized for graduate credit and offered through the UM Center for Distance and Independent Study. Courses to be taken for graduate credit must be approved by the Graduate Dean, and the enrollment form has a place designated for the Graduate Dean's signature. See:

<http://cdis.missouri.edu>

for more information on distance education opportunities.

As a minimum, the Master's Program of Study should include the following:

BIOL\_EN 8402 Research Methods (2 s.h.)

BIOL\_EN 8087 Seminar in Biological Engineering (1 s.h.)

Statistics (3 credits)

BIOL\_EN 8990 Masters Thesis Research in Biological Engineering (3 credits maximum for ME and MSNT degrees and 6 credits minimum for MST degree)

Two to four 8000 level courses (two for MST degree, three for MSNT degree and four for ME degree), at least 6 credit hours must come from Biological Engineering. Readings or Problems cannot be used to satisfy this requirements.

Additional hours may come from Biological Engineering courses numbered 7000 or above or courses from other MU departments numbered 7000 or above. Classes chosen to fill the plan of study may include those needed to fulfill proficiency areas if they are taken for graduate credit. Other courses should be chosen to strengthen the student's ability to do research in their specific area.

## PhD in Biological Engineering

### Admission Contact Information

JoAnn Lewis (lewisj@missouri.edu)  
 256 William Stringer Wing; Columbia, MO 65211-5160  
 573-882-4113

### Admission Criteria

- Fall deadline: N/A
- Minimum GPA: 3.0
- BS and MS in engineering from an accredited university or equivalent experience. In rare instances, an exceptional student will be allowed to study for the PhD without first completing an MS degree.
- Minimum Academic IELTS scores:

Item	Score
OVERALL	6.0

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	4.0
On or After August, 2011	301	4.0

## Required BE Doctoral Degree Application Materials

To the Graduate School:

- All required Graduate School documents
- Official transcripts
- TOEFL scores
- GRE scores

To the Doctoral BE Program: Contact JoAnn Lewis

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Degree Requirements Doctoral Degree in Biological Engineering

Within the first year in the program, each PhD student must pass a qualifying examination before continuing enrollment. The exam is designed to test the student's ability to undertake advanced learning and carry out independent research. A doctoral candidate must complete a minimum of 72 credit hours of course work beyond the BS degree with a minimum of fifteen hours (exclusive of research, problems or independent study courses) at the 8000 (graduate) level, including at least three BE courses. In addition, there will be a minimum of one hour of Seminar (BIOL\_EN 8087) and research (BIOL\_EN 9990) may not exceed 28 hours of the total 72 hours required in the PhD Program of Study. The courses and research plan must be approved by the doctoral program committee. The student is required to pass a comprehensive examination, which includes both written and oral components. The student must demonstrate his or her ability for in-depth research by presenting and successfully defending a dissertation embodying the results of original research. A foreign language is not required.

## Chemical Engineering

Baolin Deng, Chair  
College of Engineering  
W2033 Lafferre Hall  
(573) 882-4877  
Keyzerandrej@missouri.edu  
<http://engineering.missouri.edu/chemical/>

Chemical Engineering at the University of Missouri focuses on education and research involving industrial chemicals, materials, environmental, and life-science processes. We aim to be a reservoir of talent for the research, design, and management of complex process challenges. The Department strives to provide its faculty and students with an environment for research, learning, and professional growth.

The faculty of the MU Department of Chemical Engineering prepares its students for careers in a broad range of fields and to assume leadership roles in society through a well-rounded general and rigorous technical education. The technical curriculum challenges students with a broad education in Chemical Engineering theory and practice, and to improve their skills in problem solving, critical thinking, and appreciation of the relationship between technology and society. Innovative development and use of technology facilitates both research and teaching, creating a diverse, learning environment.

MU Chemical Engineering program aims to develop versatile professionals who can excel in a variety of career environments. Our curriculum is focused on the basic sciences, engineering topics, and problem solving and design. A flexible program offering environmental, material, and biochemical options allows our graduates to move into non-traditional careers as well as traditional chemical engineering. Additionally, we build teamwork and design skills by integrating team design projects, laboratories, and reports into our curriculum.

### Faculty

**Professor** B. Deng, T. R. Marrero\*\*, P. J. Pinhero\*\*, G. Suppes\*\*

**Adjunct Professor** J. M. Gahl\*\*, S. J. Lombardo\*\*

**Associate Professor** P. C. H. Chan\*, D. G. Retzloff\*, Y. Xing\*

**Adjunct Associate Professor** W. A. Jacoby\*

**Assistant Professor** S. Baker\*\*, M. Bernards\*\*

**Associate Teaching Professor** M. A. Myers

**Research Assistant Professor** V. Likholetov

**Professor Emeritus** R. K. Bajpai\*, M. deChazal, R. H. Luecke\*, T. S. Storvick\*, D. S. Viswanath\*, H. K. Yasuda\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 409)
- BSChE in Chemical Engineering (p. 409)
  - with emphasis in Biochemical (p. 410)

- with emphasis in Environmental (p. 410)
- with emphasis in Materials (p. 411)

### Advising and Scholarship Information Contact

Paul Chan  
W2029 Lafferre Hall  
(573) 882-7684

The educational objectives of the Chemical Engineering program at the University of Missouri are to prepare graduates who, after the first five years of their professional career, have:

1. Established themselves as practicing professionals through increased responsibilities beyond their original entry-level position, or if engaged in post-baccalaureate study are making timely progress towards an advanced degree;
2. Continuing education through special training, professional licensure, or additional certifications; and
3. Participation in professional extension through mentorship, community activities, and/or serving local/national professional societies.

Some of our graduates work in the traditional areas of chemical engineering such as the petroleum and chemical industries. Many graduates practice their profession in the areas of microelectronics, pharmaceuticals, materials, polymers, environmental protection, consumer products, or as managers in business, government careers, and engineering consultants. Still others use the chemical engineering degree as a foundation for pursuing advanced studies in medicine, law, business, or the basic sciences.

### Exploratory Course

A student wanting to explore chemical engineering as a major should take CH\_ENG 1000 Introduction to Chemical Engineering.

### Graduate

Department of Chemical Engineering  
College of Engineering  
W2030 Lafferre Hall  
573-882-3563  
<http://engineering.missouri.edu/chemical/>

**Director of Graduate Studies:** David G. Retzloff

- MS in Chemical Engineering (p. 412)
- PhD in Chemical Engineering (p. 412)

### About Chemical Engineering

Established in 1906, MU Chemical Engineering has a long standing commitment to provide quality undergraduate and graduate education. Our department serves the discipline well by providing state of the art research in many cutting edge fields including batteries, biochemical engineering, biomaterials, carbon, ceramics, catalysis, corrosion, electrochemistry, environmental sciences, ionic liquids, materials science, computational modeling & simulation, nanomaterials, nuclear materials, polymers, separations, solar energy, and surface science.

### Career Opportunities

The Chemical Engineering program develops versatile professionals who can excel in a variety of career environments. Our curriculum is focused on the basic and applied sciences, engineering topics, and problem



solving and design. Our flexible program allows our graduates to move into traditional as well as non-traditional chemical engineering careers. Additionally, we build research and development skills by integrating research, scientific inquiry, and critical thinking into our curriculum.

Some of our graduates work in the traditional areas of chemical engineering such as the petroleum and chemical industries. Many graduates practice their profession in the areas of microelectronics, pharmaceuticals, materials, polymers, environmental protection, nuclear engineering, consumer products, or as managers in business, government careers, and engineering consultants. Still others enter into careers in academia.

## Faculty Research

Currently active research areas include batteries, biochemical engineering, biomaterials, carbon, ceramics, catalysis, corrosion, electrochemistry, environmental sciences, ionic liquids, materials science, computational modeling and simulation, nanomaterials, nuclear materials, polymers, separations, solar energy, and surface science.

## Facilities and Resources

There are excellent facilities for research students, including electron microscopy, ultra-high vacuum (UHV) surface science, atomic force microscopy, a heterogeneous catalysis and reaction kinetics laboratory, a heat and mass transport laboratory, an air pollution monitoring and control laboratory, a biochemical engineering laboratory, a computational laboratory, and a transport properties phenomena laboratory. Excellent library facilities provide the latest domestic and international journals specific to chemical engineering and physical sciences research.

## Internal Funding

Research and teaching assistantships are available to qualified students for the entire year. The yearly stipend for graduate students ranges from \$17,500 to \$20,000, with a tuition waiver, depending on the student's terminal degree. Assistantships also include a tuition waiver and health insurance. Academically qualified students may receive additional scholarship awards. Grant research assistantships and some industrial and Graduate School fellowships may also be available. Extremely well-qualified students may be eligible for the Robert and Dorcas Holtzsmith Graduate Fellowship.

RA and TA appointments allow for 12 credit hours of advanced study each semester. The applicant's academic record and research potential determine the financial assistance offered. Students who receive financial assistance are expected to continue their appointment during the summer session as well, as these appointments are year long positions.

## Undergraduate

### Department Level Requirements - Chemical Engineering

The Department of Chemical Engineering has no department level requirements. All requirements are specific to the BS ChE in Chemical Engineering. Please see this section (p. 409) for further details.

## BSCHE in Chemical Engineering

### Major Program Requirements

Each graduate must complete the required curriculum designed to demonstrate knowledge and integration of chemical engineering science and practice using analytical, computational and experimental techniques. In addition, each graduate must have a comprehensive background in advanced chemistry. Graduates have a detailed working knowledge of the entire spectrum of chemical engineering activities.

All requirements listed below are in addition to University graduation requirements, including University general education (p. 18), and College of Engineering requirements. Students are also required to complete emphasis area requirements.

### Major core requirements

#### Required entry-level courses

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4100	Differential Equations	3
PHYSCS 2750	University Physics I	5
PHYSCS 2760	University Physics II	5
CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I	2
CHEM 3200	Quantitative Methods of Analysis with Lab	4

Approved statistics elective 3

#### Chemical engineering core

CH_ENG 1000	Introduction to Chemical Engineering	2
CH_ENG 2225	Mass and Energy Balance	3
CH_ENG 2226	Engineering Process Computations and Laboratory	3
CH_ENG 3234	Principles of Chemical Engineering I	3
CH_ENG 3235	Principles of Chemical Engineering II	3
CH_ENG 3243	Chemical Engineering Laboratory I	3
CH_ENG 3261	Chemical Engineering Thermodynamics I	3
CH_ENG 3262	Chemical Engineering Thermodynamics II	3
CH_ENG 4363	Chemical Reaction Engineering and Technology	3
CH_ENG 4370	Process Control Methods and Laboratory	3
CH_ENG 4385	Chemical Engineering Design I	3
CH_ENG 4980	Process Synthesis and Design	3

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5

CHEM 1320	4	CHEM 1330	4
CH_ENG 1000	2	PHYSICS 2750	5
Humanities and Social Science	3	ENGLSH 1000	3
	<b>14</b>		<b>17</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MATH 2300	3	MATH 4100	3
CHEM 2100	3	CHEM 2110	3
PHYSICS 2760	5	CHEM 2130	2
CH_ENG 2225	3	Approved Statistics Elective	3
Humanities and Social Science	3	Humanities and Social Science	3
		Approved Elective	3
	<b>17</b>		<b>17</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 3200	4	CH_ENG 3235	3
CH_ENG 2226	3	CH_ENG 3262	3
CH_ENG 3234	3	Approved Chemical Engineering Elective	3
CH_ENG 3261	3	Approved Technical Elective	3
Humanities and Social Science	3	Humanities and Social Science	3
	<b>16</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CH_ENG 3243	3	CH_ENG 4370	3
CH_ENG 4363	3	CH_ENG 4980	3
CH_ENG 4385	3	Approved Chemical Engineering Elective	3
Approved Chemical Engineering Elective	3	Approved Technical Elective	3
Approved Technical Elective	3	Humanities and Social Science	3
	<b>15</b>		<b>15</b>
Total Credits: 126			

## BScHE in Chemical Engineering with Emphasis in Biochemical

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), and the BScHE requirements (p. 409), in addition to the degree requirements below.

BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
BIO_SC 2200	General Genetics	4
BIO_SC 2300	Introduction to Cell Biology	4
BIOCHM 4270	Biochemistry	3
CH_ENG 4315	Introduction to Bioprocess Engineering	3
CH_ENG 4316	Biomass Refinery Operations	3

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

<b>First Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MATH 1500	5	MATH 1700	5
CHEM 1320	4	CHEM 1330	4
ENGLSH 1000	3	PHYSICS 2750	5
CH_ENG 1000	2	Humanities and Social Science	3
Humanities and Social Science	3		
	<b>17</b>		<b>17</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MATH 2300	3	BIO_SC 1500	5
CHEM 2100	3	MATH 4100	3
PHYSICS 2760	5	CHEM 2110	3
CH_ENG 2225	3	CHEM 2130	2
Humanities and Social Science	3	Approved Statistics Elective	3
	<b>17</b>		<b>16</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
BIO_SC 2200	4	BIO_SC 2300	4
CHEM 3200	4	CH_ENG 3235	3
CH_ENG 2226	3	CH_ENG 3262	3
CH_ENG 3234	3	Approved Chemical Engineering Elective	3
CH_ENG 3261	3	Humanities and Social Science	3
	<b>17</b>		<b>16</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CH_ENG 3243	3	BIOCHM 4270	3
CH_ENG 4316	3	CH_ENG 4315	3
CH_ENG 4363	3	CH_ENG 4370	3
CH_ENG 4385	3	CH_ENG 4980	3
Humanities and Social Science	3	Humanities and Social Science	3
	<b>15</b>		<b>15</b>
Total Credits: 130			

## BScHE in Chemical Engineering with Emphasis in Environmental

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), and the BScHE requirements (p. 409), in addition to the degree requirements below.

CH_ENG 3307	Chemical Process Safety and Professional Ethics	3
CH_ENG 4220	Hazardous Waste Management	3
CH_ENG 4311	Chemodynamics	3

CH_ENG 4312	Air Pollution Control	3
CV_ENG 3200	Fundamentals of Environmental Engineering	4
CV_ENG 4285	Pollution Prevention: Applied Engineering for Sustainable Business Practices	3

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
CHEM 1320	4	CHEM 1330	4
ENGLSH 1000	3	PHYSICS 2750	5
CH_ENG 1000	2	Humanities and Social Science	3
Humanities and Social Science	3		
	17		17
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
CHEM 2100	3	CHEM 2110	3
PHYSICS 2760	5	CHEM 2130	2
CH_ENG 2225	3	CV_ENG 3200	4
Humanities and Social Science	3	Approved Statistics Elective	3
		Humanities and Social Science	3
	17		18
Third Year			
Fall	Credits	Spring	Credits
CHEM 3200	4	CH_ENG 3235	3
CH_ENG 2226	3	CH_ENG 3262	3
CH_ENG 3234	3	CH_ENG 3307	3
CH_ENG 3261	3	CH_ENG 4311	3
Humanities and Social Science	3	Approved Chemical Engineering Elective	3
	16		15
Fourth Year			
Fall	Credits	Spring	Credits
CH_ENG 3243	3	CH_ENG 4220	3
CH_ENG 4312	3	CH_ENG 4370	3
CH_ENG 4363	3	CH_ENG 4980	3
CH_ENG 4385	3	CV_ENG 4285	3
Environmental Law	3	Humanities and Social Science	3
	15		15
Total Credits: 130			

## BScHE in Chemical Engineering with Emphasis in Materials

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), and the BScHE requirements (p. 409), in addition to the emphasis requirements below.

ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2200	Intermediate Strength of Materials	3
CH_ENG 4317	Chemical Processing in Semiconductor Device	3
CH_ENG 4319	Introduction to Polymer Materials	3
CH_ENG 4321	Introduction to Ceramics	3
Approved Materials Elective		6

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
CHEM 1320	4	CHEM 1330	4
ENGLSH 1000	3	PHYSICS 2750	5
CH_ENG 1000	2	Humanities and Social Science	3
Humanities and Social Science	3		
	17		17
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
CHEM 2100	3	CHEM 2110	3
PHYSICS 2760	5	CHEM 2130	2
CH_ENG 2225	3	ENGINR 1200	3
Humanities and Social Science	3	Approved Statistics Elective	3
		Humanities and Social Science	3
	17		17
Third Year			
Fall	Credits	Spring	Credits
CHEM 3200	4	CH_ENG 3235	3
CH_ENG 2226	3	CH_ENG 3262	3
CH_ENG 3234	3	CH_ENG 4321	3
CH_ENG 3261	3	Approved Chemical Engineering Elective	3
ENGINR 2200	3	Humanities and Social Science	3
	16		15
Fourth Year			
Fall	Credits	Spring	Credits
CH_ENG 3243	3	CH_ENG 4319	3
CH_ENG 4317	3	CH_ENG 4370	3

CH_ENG 4363	3	CH_ENG 4980	3
CH_ENG 4385	3	Approved Materials Elective	3
Approved Materials Elective	3	Humanities and Social Science	3
	15		15
Total Credits: 129			

## Graduate

### MS in Chemical Engineering

#### Application and Admission Information

Rita Preckshot  
 Administrative Assistant to the Director of Graduate Studies  
 Department of Chemical Engineering  
 W2030 Lafferre Hall  
 Columbia, MO 65211  
 573-882-3563  
<http://engineering.missouri.edu/chemical/degree-programs/>

#### Application Deadlines

Fall Deadline: March 15  
 With change of degree within MU: May 15  
 Spring Deadline: October 15  
 With change of degree within MU: November 1

#### Admission Criteria

- Minimum GPA: 3.0
- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1100
On or After August 1, 2011	300

**Note:** Consideration is given to grade trends, performance in the area of chemical engineering and mathematics and other criteria bearing on a student's probable success in graduate study. Selected students with less than a 3.0 overall GPA may be considered on a probationary basis. Financial support is competitive and requires a minimum 3.0 GPA. Graduates holding degrees in physics, chemistry, applied mathematics and related fields also may be considered for candidacy, but are required to take additional course work.

#### Required Application Materials

*To the Graduate School*

- All required Graduate School documents

*To the Chemical Engineering Program*

- Resume
- Statement of Purpose
- 3 letters of reference
- GRE scores (School Code: 6875; Dept. Code: 1001)

#### Financial Aid from the Program

All applicants are considered for internal assistantships, fellowships, and other funding packages. Support is awarded based on availability and qualifications of applicant.

#### Plan of Study

An individual program of a minimum of 30 semester hours is required and includes seminars, advanced courses in chemical engineering, physical and chemical sciences, mathematics and no more than nine hours of research or other unscheduled work. No foreign language or collateral field is required. A thesis is required and a candidate will complete the master's program by passing an examination in defense of the thesis.

### PhD in Chemical Engineering

#### Application and Admission Information

Rita Preckshot  
 Administrative Assistant to the Director of Graduate Studies  
 Department of Chemical Engineering  
 W2030 Lafferre Hall  
 Columbia, MO 65211  
 573-882-3563  
<http://engineering.missouri.edu/chemical/degree-programs/>

#### Application Deadlines

Fall Deadline: March 15  
 With change of degree within MU: May 15  
 Spring Deadline: October 15  
 With change of degree within MU: November 1

#### Required Application Materials

*To the Graduate School*

- All required Graduate School documents

*To the Chemical Engineering Program*

- Resume
- Statement of Purpose
- 3 letters of reference
- GRE scores (School Code: 6875; Dept. Code: 1001)

#### Financial Aid from the Program

All applicants are considered for internal assistantships, fellowships, and other funding packages. Support is awarded based on availability and qualifications of applicant.

#### Plan of Study

An applicant for the PhD program must take a qualifying examination and a comprehensive examination. Twenty-one semester hours of course work beyond the MS degree is required. Before being admitted to candidacy and proceeding to prepare a dissertation, the student must pass a comprehensive examination. The exam involves a project to be completed within a 30-day period, requiring original and creative work in delineating a research problem of some substance. A dissertation is required of all candidates. A final oral examination will be held where the candidate defends their dissertation.

## Civil Engineering

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M. R. Virkler, P.E., Chair  
College of Engineering  
E2509 Lafferre Hall  
(573) 882-6269  
<http://www.civil.missouri.edu>

Civil engineering is about community service, development, and improvement. Civil engineers are involved in all levels of the planning, design, construction, and operation of facilities essential to modern life, ranging from infrastructure development and maintenance, waste disposal, transit systems, water supply and treatment systems, and offshore energy exploration structures. Civil engineers are problem solvers, meeting the challenges of pollution, traffic congestion, drinking water supply and energy needs, national security, communication, urban redevelopment, and sustainable community planning.

### Faculty

**Professor** J. J. Bowders Jr\*, P.E., Z. Chen\*\*, P.E., T. E. Clevenger\*, B. Deng\*\*, V. S. Gopalaratnam\*, P.E., S. A. Kiger\*, P.E., M. R. Virkler\*, P.E.

**Associate Professor** Z. Hu\*\*, W. J. Likos\*\*, J. E. Loehr, P.E., B. L. Rosenblad\*\*, H. A. Salim\*\*, P.E., C. C. Sun\*\*, P.E., K. M. Trauth\*\*, P.E., G. A. Washer\*\*, P.E.

**Assistant Professor** P. K. Edara\*\*, P.E., E. C. Inniss\*, T. C. Matisziw\*\*, S. L. Orton#, P.E.

**Research Associate Professor** R. E. Reed\*, P.E., X. Yu

**Adjunct Faculty** D. P. Gwaze\*, R. D. Hammer, C. J. Nemmers\* P.E., V. Pattarkine, R. Surampalli, C. Yarnell

**Professor Emeritus** S. K. Banerji\*, R. D. Hammer, J. B. McGarraugh\*

**Emeritus Faculty** R. T. Douty, D. L. Guell

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 414)
- BSCiE in Civil Engineering (p. 415)

The Department of Civil and Environmental Engineering offers a Bachelor of Science in Civil Engineering (BSCiE). Most graduates take the Fundamentals of Engineering Exam. Graduates are encouraged to become registered professional engineers and to continue their education throughout their careers.

### Educational Mission

The educational objectives of the Bachelor of Science in Civil Engineering describe the expected accomplishments of graduates during the first 5 to 6 years after graduation. It is expected that nearly all students completing the requirements of the Bachelor of Science in Civil Engineering will engage in the life-long learning necessary to advance professionally in the field of civil engineering and contribute to society and the profession through involvement in professional or other service activities.

It is expected that most graduates will

1. Enter the profession of civil engineering with proficiency in environmental engineering, geotechnical engineering, structural engineering, transportation engineering and water resources engineering. In doing so, these students will
  - A. Take and pass the Fundamentals of Engineering exam
  - B. Gain employment as an engineer-in-training
  - C. Take and pass the Professional Engineers Exam, and
  - D. Be licensed to practice engineering in one or more states

It is expected that some graduates will

1. Begin careers in civil engineering-related industries, especially construction and other careers not requiring professional licensure
2. Begin and complete graduate study in civil engineering at MU or other Carnegie doctoral extensive universities, and
3. Begin and complete graduate/professional study in other associated fields

The following list of outcomes describes what graduates are expected to know and to be able to do when they complete the program. At graduation, graduates will have:

- a. Ability to apply knowledge of mathematics through differential equations, probability and statistics, calculus-based physics, geology and general chemistry to civil engineering problems
- b. Ability to conduct laboratory experiments and to critically analyze and interpret experimental data related to soil mechanics, fluid mechanics and civil engineering materials
- c. Ability to perform civil engineering design by means of design experiences integrated throughout the professional component of the curriculum
- d. Ability to function on teams that must integrate contributions from different areas of civil engineering toward the solution of multidisciplinary projects
- e. Ability to identify, formulate and solve civil engineering problems
- f. Understanding of professional practice issues in civil engineering including professional and ethical responsibility, procurement of work, bidding vs. quality based selection processes, how design professionals and construction professions interact to construct a project and the importance of professional licensure and continuing education
- g. Ability to write and speak effectively
- h. The broad education necessary to understand the impact of civil engineering solutions in a global and societal context
- i. Recognition of the need for, and an ability to engage in life-long learning
- j. Knowledge of contemporary issues as they relate to civil engineering problems and solutions
- k. Ability to use the techniques, skills and modern engineering tools necessary for civil engineering practice, particularly in areas of environmental/water resources, geotechnical, structural and transportation engineering

## Graduate

April Klug kluga@missouri.edu  
Graduate Program Coordinator  
573-882-4442  
573-882-4784 (fax)  
<http://engineering.missouri.edu/civil/>

**Director of Graduate Studies:** Carlos Sun

- MS in Civil Engineering (p. 416)
- PhD in Civil Engineering (p. 416)

## About the Program

Civil engineering education at MU began in 1856 with the establishment of the first Chair of Civil Engineering. Graduate programs offered by the department prepare students for leadership positions in academia, research and advanced practice engineering careers. Major program areas include structural mechanics, structural engineering and materials, geotechnical and geoenvironmental engineering, environmental engineering, hydrology and water resources engineering and transportation engineering

## Areas of Study

**Structural Mechanics, Structural Engineering and Materials.** Study areas: fracture and failure of composites, model-based simulation, inelastic response of materials and structures, bridge engineering, linear and nonlinear structural dynamics, explosion resistant structural design, timber engineering, microstructure of porous materials, concrete and aggregate durability, advanced fiber reinforced composites for construction and nondestructive structural health evaluation

**Environmental Engineering.** Study areas: water pollution control, water purification, wastewater treatment, the disposal of residues from these processes and hazardous and solid waste management. Other areas of research include the application of physical, chemical and microbiological principles to design of water supply systems, pollution control facilities and contaminant transport through soils.

**Geotechnical and Geoenvironmental.** Study areas: strength, deformation and flow properties of earthen materials and application of this understanding to foundation engineering, slope stability analyses, earth structures design, and geoenvironmental challenges. Research areas include: unsaturated soil mechanics, soil improvement techniques, geosynthetics, landfills and waste containment, stabilization and maintenance of earth slopes, in situ soil cleanup technologies, geotechnical earthquake engineering, nondestructive geophysical technologies for subsurface applications, satellite – and ground-based remote sensing risk analysis and reliability-based design.

**Transportation Engineering.** Study areas: traffic engineering, intelligent transportation systems, highway safety, network modeling and simulation, geographic information systems, security and evacuations, transportation planning, traffic flow theory, highway design, intersection operations, bicycle and pedestrian facilities, infrastructure management, driver behavior, airport engineering, transportation legal issues, artificial intelligence and advanced computing applications in transportation.

**Hydrology and Water Resources.** Study areas: hydrologic, hydraulic, regulatory/public policy and geographic information system applications for transportation, surface water quality and storm water management and decision making.

## Facilities and Resources

The department has laboratories for experimental research in structural engineering, materials, geotechnical and geoenvironmental engineering, environmental engineering, and transportation engineering.

**Structural Testing.** Several computer-controlled electrohydraulic testing machines and associated instrumentation are available in the high-bay structural engineering and materials engineering laboratories. The laboratories are serviced by a 5-ton overhead crane. An additional structural testing facility located south of the campus houses a 100-foot by 20-foot structural floor with anchor points on a 4-foot-square grid. This high-bay facility is serviced by a 10-ton overhead crane. There is also a materials laboratory for concrete mix design and evaluation.

**Geotechnical Testing.** The laboratories house state-of-the-art permeability, consolidation, triaxial, geosynthetics, soil dynamics and unsaturated soil mechanics testing equipment and is home to the Missouri Soil Characterization Laboratory. Additional laboratories include facilities and equipment for large-scale model testing of slopes, piles and other geotechnical systems, including a 10-acre geotechnical experiment site.

**Environmental Testing Labs.** The Laboratories are supplied with analytical equipment for the complete physical, chemical and microbiological analysis of water and waste water.

**Transportation Laboratory.** The laboratories include capabilities in advanced surveillance and video image processing, transportation modeling and simulation, Geographical Information Systems, traffic management and control, driver behavior, and safety.

## Funding

In addition to fellowships supported by the National Science Foundation (NSF), the US Environmental Protection Agency, Federal Highway Administration and other governmental agencies, several graduate assistantships are available each year. The assistantships are primarily research appointments; however, the Department does make a limited number of teaching assistantship appointments. Most assistantships offer tuition waivers and health insurance.

## Undergraduate

### Department Level Requirements - Civil Engineering

The department of Civil and Environmental Engineering does not have any departmental level degree requirements. Students should refer to Major Program requirements listed in the BSCIE section of this catalog (p. 415).

### Departmental Honors

Students who will graduate with a 3.0 GPA or higher are eligible for the College of Engineering honors program. Interested students should ask their advisor for details about this highly rewarding program that can include earning a salary for research performed under the guidance of a faculty member.

# BSCiE in Civil Engineering

## Major Program Requirements

Engineering topics start with basic computer and graphics courses. These are followed with basic engineering science courses, which ground the students in the fundamentals necessary for future course work and a sophomore design experience.

Engineering topics courses in the junior year provide students with the basic fundamentals in the areas of environmental engineering, geotechnical engineering, hydrology, water resources, structural engineering, transportation/traffic engineering, engineering economics, and probability and statistics. Many of these topics courses contain elements of civil engineering design. Elective courses in the senior year enable students to specialize or obtain a broad educational background across the civil engineering discipline.

Design is integrated throughout the curriculum. The capstone design project is supplied by consultants or governmental agencies. The course requires working in teams, making oral and written presentations and completing a final design report. Oversight, interaction and evaluation are provided by practicing engineers from industry and governmental organizations.

In addition to the major core requirements, students must complete all University graduation requirements (p. 17) including University General Education Requirements (p. 18), as well as all degree and college requirements (p. 400).

## Major Core Requirements

<b>Math</b>		<b>16</b>
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4100	Differential Equations	3
<b>Basic Sciences</b>		<b>17-18</b>
CHEM 1320	College Chemistry I	4
GEOL 1150	Physical Geology for Scientists and Engineers	4
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5-6
or CHEM 1330	College Chemistry II	
& CHEM 2100	and Organic Chemistry I	
<b>Engineering Topics-General</b>		<b>17</b>
CMP_SC 1040	Introduction to Problem Solving and Programming	3
ENGINR 1100	Engineering Graphics Fundamentals	2
ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2200	Intermediate Strength of Materials	3
Engineering topics elective		6
Select two of the following:		
<b>(a)</b>		
ENGINR 2100	Circuit Theory for Engineers	3-4
or BIOL_EN 4380	Applied Electronic Instrumentation	
or CV_ENG 4610	Sensors and Experimental Stress Analysis	
<b>(b)</b>		
ENGINR 2300	Engineering Thermodynamics	3
or CH_ENG 3261	Chemical Engineering Thermodynamics I	

<b>(c)</b>		
CV_ENG 2080	Introduction to Dynamics	3
or MAE 2600	Dynamics	
<b>Civil Engineering Topics</b>		
CV_ENG 3010	Decision Methods for Civil Engineering Design	3
CV_ENG 3100	Fundamentals of Transportation Engineering	4
CV_ENG 3200	Fundamentals of Environmental Engineering	4
CV_ENG 3300	Structural Analysis I	4
CV_ENG 3312	Reinforced Concrete Design	3
or CV_ENG 3313	Structural Steel Design	
CV_ENG 3400	Fundamentals of Geotechnical Engineering	4
CV_ENG 3600	Civil Engineering Materials	4
CV_ENG 3700	Fluid Mechanics	3
CV_ENG 3702	Hydrology	4
CV_ENG 4980	Civil Engineering Systems Design	3
CV_ENG Electives		15
<b>Advisor-approved electives</b>		<b>3</b>

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
CHEM 1320	4	PHYSICS 2750	5
ENGINR 1100	2	GEOL 1150	4
ENGLISH 1000	3	S BS or HS FA **	3
S BS or HS FA **	3		
	17		17
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
ENGINR 1200	3	PHYSICS 2760	5
CV_ENG 3010	3	ENGINR 2200	3
CV_ENG 3200	4	CV_ENG 3100	4
S BS or HS FA **	3		
	16		15
Third Year			
Fall	Credits	Spring	Credits
CV_ENG 3300	4	CMP_SC 1040	3
CV_ENG 3400	4	CV_ENG 3702	4
CV_ENG 3600	4	CV_ENG 3312 or 3313	3
CV_ENG 3700	3	Civil Engineering Elective	3
Approved Elective	1	S BS or HS FA **	3
	16		16

Fourth Year			
Fall	Credits	Spring	Credits
Engineering Topics Elective	3	CV_ENG 4980	3
Engineering Topics Elective	3	S BS or HS FA **	3
Civil Engineering Elective	6	Civil Engineering Electives	6
S BS or HS FA **	3	Approved Elective	3
	<b>15</b>		<b>15</b>
Total Credits: 127			

\* Denotes General Education Requirements

\*\* S BS = Social Behavior Science; HS FA = Humanities Studies/Fine Arts

## Graduate

### MS in Civil Engineering

April Klug kluga@missouri.edu  
 Graduate Program Coordinator  
 573-882-4442  
 573-882-4784 (fax)  
<http://engineering.missouri.edu/civil/>

#### Application Deadlines

Priority admission and funding consideration are given to applications received by February 15/September 15. Applications submitted after February 15/September 15 will be considered, with preference going to those received by May 1/December 1. Prospective students applying after May 1/December 1 will be considered for fall/spring admission on a case by case basis.

#### Admission Criteria

- Minimum GPA: 3.0 in last 2 years of coursework. Note: Lower than 3.0 GPA requires special action and substantiation such as good test scores on the GRE or other recognized examinations.
- BS in engineering. Applicants with BS degrees in related fields may be considered for admission. If admitted, non-engineers are required to complete remedial courses as determined by their adviser and advisory committee.
- GRE test is required but no minimum score set. Typical acceptance scores: around 1100 for Verbal + Quantitative and between 4.0 and 5.0 for Analytical.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum Academic IELTS scores:

Item	Score
OVERALL	6.0

#### Required Application Materials

Upload to the Graduate School:

- All required Graduate School documents
- 3 Letters of Recommendation

- At least two from faculty members who have taught or advised you
- GRE scores
- Resume
- Statement of Purpose
  - See instructions (<http://engineering.missouri.edu/civil/degree-programs/statement-of-purpose-guidelines>)

#### Financial Aid from the Program

If you wish to be considered for financial aid, please complete the financial aid section of the departmental application.

Electronic submissions of all application materials are preferred; however, paper submittals will be accepted.

#### Plan of Study

Students are accepted for advisement upon CE Graduate Admissions Committee review. The degree designation at the master's level is Master of Science (M.S.) in Civil Engineering. To obtain a master's degree you must take a total of 31 hours for graduate credit, at least 15 hours of which must be 8000-level courses or research (CV\_ENG 8990) with the remainder being either 7000 or 8000-level courses and a one hour graduate seminar. For most students this means taking eight (8) 3-hour courses at the appropriate level, completing six (6) hours of thesis research (CV\_ENG 8990), and enrolling in the 1-hour seminar associated with your specialty area. Students should consult with their academic adviser to ensure all requirements are satisfied.

#### Thesis and Examination

A final oral examination is required of all master's candidates. Approximately two weeks before this examination, a candidate must submit to an examining committee a thesis, a formal report or a design of professional quality applying the knowledge gained in course work to the solution of an engineering problem. Students who receive research appointments or traineeships are required to submit a thesis. Formal or design report is at the discretion of the adviser.

### PhD in Civil Engineering

April Klug kluga@missouri.edu  
 Graduate Program Coordinator  
 573-882-4442  
 573-882-4784 (fax)  
<http://engineering.missouri.edu/civil/>

#### Application Deadlines

Priority admission and funding consideration are given to applications received by February 15/September 15. Applications submitted after February 15/September 15 will be considered, with preference going to those received by May 1/December 1. Prospective students applying after May 1/December 1 will be considered for fall/spring admission on a case by case basis.

#### Admission Criteria

- Minimum GPA: 3.0 in last 2 years of coursework. Note: Lower than 3.0 GPA requires special action and substantiation such as good test scores on the GRE or other recognized examinations.



- BS in engineering. Applicants with BS degrees in related fields may be considered for admission. If admitted, non-engineers are required to complete remedial courses as determined by their adviser and advisory committee.
- GRE test is required but no minimum score set. Typical acceptance scores: around 1100 for Verbal + Quantitative and between 4.0 and 5.0 for Analytical.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum Academic IELTS scores:

Item	Score
OVERALL	6.0

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Civil Engineering Program:*

Upload all of the following items to the Apply Yourself/Graduate School System. DO NOT send any hard copies to the Civil Engineering department.

- 3 Letters of Recommendation
  - At least two from faculty members who have taught or advised you
- GRE scores
- Resume
- Statement of Purpose
  - See instructions (<http://engineering.missouri.edu/civil/degree-programs/statement-of-purpose-guidelines>)

## Financial Aid from the Program

If you wish to be considered for financial aid, please complete the financial section of the departmental application.

Electronic submissions of all application materials are preferred; however, paper submittals will be accepted.

## Qualifying for Candidacy

Students are accepted for advisement upon CE Graduate Admissions Committee review. Formal acceptance to the PhD program is based on a qualifying examination, administered by faculty members in the student's area of concentration, during the first year of post-master's work. In cases where students desiring PhD candidacy take a master's degree with thesis option in this department, the master's oral examination may be combined with the qualifying examination at the discretion of the advisor and dissertation committee.

## Plan of Study

PhD programs are committee administered and tailored to fit the needs of each individual student. A minimum of 72 credit hours, including the credit hours taken during the MS program beyond the bachelor's degree, are required. Students who received the MS degree from other than MU may transfer up to 30 hours of credit from their MS degree. The candidate must pass a comprehensive examination and submit and defend a dissertation at a final oral examination.

## More Information

More information about the Department of Civil and Environmental Engineering and further details about specific programs and application materials may be obtained from the department's website: <http://www.civil.missouri.edu>.

## Computer Engineering

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S. Kovaleski, Interim Chair  
College of Engineering  
349 Engineering Building West  
(573) 882-6387  
kovaleskis@missouri.edu

The Department of Electrical & Computer Engineering is one of 9 academic departments within the College of Engineering at the University of Missouri.

Established in 1884 as the first electrical engineering program in the nation, this ABET accredited program is now home to more than 300 undergraduate students, almost 150 graduate students and 21 faculty members.

### Faculty

**Professor** R. D. Curry\*\*, C. H. Davis\*, J. M. Gahl\*\*, S. Gangopadhyay\*\*, D. K. C. Ho\*\*, N. E. Islam\*\*, J. M. Keller\*, N. D. Manring\*, S. Nair\*\*, R. M. O'Connell\*\*, M. Skubic\*\*, J. E. Thompson\*, H. W. Tyrer Jr.\*\*

**Associate Professor** M. Almasri\*\*, G. DeSouza\*\*, T. G. Engel\*, Z. He\*\*, S. D. Kovaleski\*\*, J. W. Kwon\*\*, J. J. Legarsky\*\*, G. Triplett\*\*

**Assistant Professor** M. Becchi\*\*, T. Han#, C. Xiao\*, A. Zare\*\*

**Professor Emeritus** L. A. Akers\*, M. J. Devaney\*\*, R. W. McLaren\*, B. W. Sherman, K. Unklesbay

**Associate Professor Emeritus** R. W. Leavene Jr.\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

Advising and Scholarship Contact  
Tami Beatty  
Undergraduate Program Office  
349C Engineering Building-West  
(573) 882-2648  
beattyt@missouri.edu

- Department Level Requirements (p. 421)
- BSCoE in Computer Engineering (p. 421)

The Department of Electrical and Computer Engineering offers both the Bachelor of Science with a major in Electrical Engineering and the Bachelor of Science with a major in Computer Engineering. The undergraduate program in both degrees at the University of Missouri provides students with the requisite fundamentals in either discipline and prepares them for beginning practice in both the traditional and emerging fields of these disciplines. The degree programs are flexible 126-credit structures that provide the fundamentals of engineering, in addition to a thorough coverage of the major specialties within their respective fields. In addition, technical electives allow concentration in selected areas.

The ECE department emphasizes close interaction with industry. Industry engineers visit regularly and industry-sponsored student projects are provided to give extra dimension to the program.

Many students in the ECE department combine the electrical engineering major with the computer engineering major in a special 138-credit program. These students receive both the BS EE and BS COE degrees.

Students interested in interdisciplinary studies may use some electives to study business, premedicine, prelaw, and other areas. Students are able to choose from a wide variety of courses offered by other departments in the College of Engineering, as well as from other MU colleges, taking advantage of the multidisciplinary nature of the campus.

Commencing in the Fall Semester 2011, the Program Educational Objectives (PEOs) of the undergraduate program in Electrical Engineering at MU are to nurture graduates who:

- Communicate effectively, both in written reports and oral presentations.
- Analyze and design electrical systems effectively.
- Possess comprehensive problem-solving skills, including the ability to define problems and to evaluate alternative solutions.
- Work effectively in teams consisting of diverse cultures and disciplines.
- Are passionate about engineering, as demonstrated by their leadership, innovation, motivation, and interest in continuing education.

Commencing in the Fall 2011, the Program Educational Objectives (PEOs) of the undergraduate program in computer Engineering at MU are to nurture graduates who:

- Communicate effectively, both in written reports and oral presentations.
- Analyze and design electrical systems effectively.
- Possess comprehensive problem-solving skills, including the ability to define problems and to evaluate alternative solutions.
- Work effectively in teams consisting of diverse cultures and disciplines.
- Are passionate about engineering, as demonstrated by their leadership, innovation, motivation, and interest in continuing education.

### ECE Honors Program

The ECE Honors Program follows the general rules and philosophy of the College of Engineering Honors Program. Students may enter the program from the beginning of the junior year and must have a GPA of 3.0/4.0 at the start. Eligible students participate in the program by enrolling in ECE 4995 Undergraduate Honors Research in Electrical Computer Engineering for one to three credit hours, which replaces an equivalent number of hours of ECE technical electives.

The heart of the program is a research or advanced design project culminating in an undergraduate honors thesis. The project is conducted under the supervision of the honors advisor, who is an ECE faculty member selected by mutual agreement between the student and the professor. Satisfactory completion of the project requires approval (signatures) of the honors thesis by both the honors advisor and an additional faculty member, who serves as second reader of the thesis. Students who complete the program and graduate with a GPA of a least 3.0 receive the designation "Honors Scholar in Engineering" at graduation and on their diploma.

Another valuable feature of the Honors Program is that participants may reduce the number of credit hours required for degree completion to the University minimum of 120 by substituting up to six hours of credit from graduate courses through dual (undergraduate/graduate) enrollment during the last four semesters of the undergraduate program and after completion of the honors project.

## Double Majors - Electrical Engineering and Computer Engineering

Many students in the ECE department combine the BS in Electrical Engineering with the BS in Computer Engineering in a special 138-credit program. These students receive both the BS EE and BS CoE degrees.

### Major Program Requirements

#### Constitutional Elective

Select one of the following:	3
HIST 1100 Survey of American History to 1865	
HIST 1200 Survey of American History Since 1865	
HIST 1400 American History	
HIST 2210 Twentieth Century America	
HIST 2440 History of Missouri	
HIST 4000 Age of Jefferson	
HIST 4220 U.S. Society Between the Wars 1918-1945	
HIST 4230 Our Times: United States Since 1945	
POL_SC 1100 American Government	
POL_SC 2100 State Government	

Humanities/Fine Arts courses	9
Social Science/Behavioral Science courses	3

Select two of the following:	6
ENGINR 1200 Statics and Elementary Strength of Materials	
ENGINR 2300 Engineering Thermodynamics	
IMSE 2710 Engineering Economic Analysis	

#### Other major core requirement courses:

MATH 1500 Analytic Geometry and Calculus I	5
MATH 1700 Calculus II	5
MATH 2300 Calculus III	3
MATH 2320 Discrete Mathematical Structures	3
MATH 4100 Differential Equations	3
STAT 4710 Introduction to Mathematical Statistics	3
PHYSICS 2750 University Physics I	5
PHYSICS 2760 University Physics II	5
CHEM 1320 College Chemistry I	4
ENGLISH 1000 Exposition and Argumentation	3
ECONOM 1014 Principles of Microeconomics	3
or ECONOM 1015 Principles of Macroeconomics	
or ECONOM 1024 Fundamentals of Microeconomics	
CMP_SC 1050 Algorithm Design and Programming I	3
CMP_SC 2050 Algorithm Design and Programming II	3
ECE 1000 Introduction to Electrical and Computer Engineering	2
ECE 1210 Introduction to Logic Systems	3

ECE 2100 Circuit Theory I	4
ECE 3210 Microprocessor Engineering	4
ECE 3810 Circuit Theory II	4
ECE 3220 Computing for Embedded Systems	3
ECE 3830 Signals and Linear Systems	3
ECE 3510 Electromagnetic Fields	3
ECE 3410 Electronic Circuits and Signals I	4
ECE 3610 Semiconductors and Devices	3
ECE 3110 Electrical and Computer Engineering Projects	3
ECE 4220 Real Time Embedded Computing	3
ECE 4250 VHDL and Programmable Logic Devices	4
ECE 4270 Computer Organization	4
ECE 4970 Senior Capstone Design	3

#### Electives

3000+ ECE or CMP_SC Elective	12
ECE 4000+ Technical Elective	6
ECE 4000-level Senior Lecture/Lab	4
Any Elective	1

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CHEM 1320	4	CMP_SC 1050	3
MATH 1500	5	ECE 1210	3
ECE 1000	2	ENGLISH 1000	3
Constitutional Requirement	3	MATH 1700	5
Economics Elective	3	Humanities/Fine Arts Elective	3
	17		17
Second Year			
Fall	Credits	Spring	Credits
ECE 2100	4	CMP_SC 2050	3
ECE 3210	4	ECE 3810	4
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	PHYSICS 2760	5
	16		15
Third Year			
Fall	Credits	Spring	Credits
ECE 3410	4	ECE 3610	3
ECE 3220	3	ECE 4250	4
ECE 3510	3	MATH 2320	3
ECE 3830	3	ECE 4000+ Technical Elective	3
STAT 4710	3	Flexible Technical Elective	3
	16		16
Fourth Year			
Fall	Credits	Spring	Credits
ECE 4220	3	ECE 3110	3
ECE 4270	4	ENGINR 1200, 2300, or IMSE 2710	3

ENGINR 1200, 2300, or IMSE 2710	3	ECE 4000+ Technical Elective	3
Flexible Technical Elective	3	Flexible Technical Elective	3
Social/Behavioral Science Elective	3	Humanities/Fine Arts Elective	3
	<b>16</b>		<b>15</b>
<b>Fifth Year</b>			
<b>Fall</b>	<b>Credits</b>		
ECE 4970 (WI)	3		
ECE 4000-level Senior Lecture/Lab	4		
Flexible Technical Elective	3		
Humanities/Fine Arts Elective	3		
	<b>13</b>		
Total Credits: 141			

## Graduate

349 Engineering Building West  
 Columbia, MO 65211  
 Phone: 573-882-4436  
 Email: [umcengregegradoff@missouri.edu](mailto:umcengregegradoff@missouri.edu)  
<http://engineering.missouri.edu/ece/>

- MS in Computer Engineering (p. 422)

The Department also offers a PhD in Electrical and Computer Engineering (p. 432), and the College of Engineering offers an interdepartmental ME in Engineering with a focus in Computer or Electrical Engineering (p. 442).

## The Department

Established in 1885, the Department of Electrical & Computer Engineering has a long tradition of excellence. Our classes are small with extensive design and laboratory experimentation. Research opportunities exist for both undergraduate and graduate students in Communication and Signal Processing, Physical Electronics, Intelligent Systems, Systems Modeling and Control, Nano and Micro Electronics, and Digital / Computer Systems.

## Career Opportunities

Throughout the 20th century, the electrical engineering and computer engineering professions devised many of the innovations that dominated the technology landscape. In the 21st century, electrical and computer engineers will be at the forefront of a wide spectrum of technologies including nanotechnology, biotechnology, sensors, power generation, electric vehicles, and telecommunications.

## Areas of study include

Communications and Signal Processing. Satellite remote sensing, geospatial intelligence, image/video processing, land-mine detection, speech signal processing, wireless communications, underwater communications.

Physical Electronics. Medical applications and advanced sterilization of food, water and products using pulsed power, pulsed power applications and research (MU Gigawatt Rep-rate Test Stand. Lasers, high voltage switching and power conditioning, high voltage pulse technology and plasmas with the 2.5 MV, 250 kA MU-Terawatt Test Stand), interesting plasma science applications, like high voltage accelerators to propel micro spacecraft, electromagnetic launchers, radio-frequency effects on

electronics, power electronics, microwave photonics, electrooptics and photoconductive switches.

Intelligent Systems. Basic and applied research in computational intelligence (neural networks, fuzzy systems, evolutionary computation, swarm intelligence), spatial reasoning for scene understanding and human/robot interaction, pattern recognition and automated decision making, eldercare technology, computer vision and image processing, human activity analysis, cognitive robotics, landmine and explosive detection.

Systems Modeling and Control. Control systems, computer process control, digital and sampled data control, robotics, system biology; biologically realistic modeling, computational, neuroscience, theoretical neuroscience, electrophysiology.

Nano and Micro Electronics. Nano/microelectromechanical systems (N/ MEMS), micro sensors and actuators, High K dielectrics, nano structures, complex heterostructures (i.e. HEMTs, VCSELs, detectors, HBTs, etc), BioMEMS and biomedical microsystems.

Digital System and Circuit Design, Computer Process Control. Excellent computer equipment and other laboratory facilities are used for research sponsored by various government and industry sources. The ECE department is the home department of the following University centers: Center for Geospatial Intelligence, Center for Micro/Nano Systems and Nanotechnology, Center for Eldercare and Rehabilitation Technology, Center for Physical Electronics and Power Electronics, Center for Electromechanics and Energy Conversion, Interdisciplinary Center for Research in Earth Science Technologies, Institute for Computational Neurobiology.

## Internal Funding

### Teaching Assistantships

Teaching assistantships are normally awarded to qualified graduate students with appropriate communication skills who assist faculty members in various phases of instruction. International students may not be appointed to teaching assistantships in their first semester on campus. International students must pass a language screening test at a proper level to be eligible for the TA positions available.

### Research Assistantships

Research assistantships are granted to students qualified for working with professors on particular research projects. The research assistants are selected by faculty members who have research funds to support graduate students. Therefore, students should contact the faculty members directly for the RA possibility.

### Fellowships

The department faculty actively pursue funding for selected research fellowships. Available fellowship opportunities can be found by contacting the ECE Graduate Office. Additionally, a limited number of "Teaching Fellows" are awarded annually to outstanding PhD students, particularly for those preparing for academic careers. Details can be obtained from the ECE Graduate Office.

## Undergraduate

## Department Level Requirements - Computer Engineering

Both the Bachelor of Science in Electrical Engineering (BS EE) and the Bachelor of Science in Computer Engineering (BS COE) require that students earn a 2.0 GPA or better in all courses that have an MU engineering prefix. All ECE courses require a grade of C or better in ECE prerequisites.

Engineering design in both the electrical engineering and computer engineering programs is provided through an integrated laboratory structure. Beginning with the first laboratory course in the fourth semester of each program, students have a significant design and laboratory experience in each semester of their respective programs.

In addition to the major core requirements, students must complete all University graduation requirements including University general education, as well as all degree and college or school requirements.

## BSCoE in Computer Engineering

### Major Program Requirements

The computer engineering degree offers a balanced approach to both hardware and software, as well as other areas of engineering. Focused areas of work in additional hardware or software, communications, discrete and integrated electronics, and robotics are offered by the department. (Focus areas are not listed on transcripts or diplomas.)

Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 421), in addition to the degree requirements below.

#### Major core requirements

##### Constitutional Elective

Select one of the following: 3

HIST 1100	Survey of American History to 1865	
HIST 1200	Survey of American History Since 1865	
HIST 1400	American History	
HIST 2210	Twentieth Century America	
HIST 2440	History of Missouri	
HIST 4000	Age of Jefferson	
HIST 4220	U.S. Society Between the Wars 1918-1945	
HIST 4230	Our Times: United States Since 1945	
POL_SC 1100	American Government	
POL_SC 2100	State Government	

Humanities/Fine Arts courses 9

Social Science/Behavioral Science courses 6

##### Other major core requirement courses:

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 2320	Discrete Mathematical Structures	3
MATH 4100	Differential Equations	3
STAT 4710	Introduction to Mathematical Statistics	3
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5

CHEM 1320	College Chemistry I	4
ENGLSH 1000	Exposition and Argumentation	3
ENGINR 1200	Statics and Elementary Strength of Materials	3
or ENGINR 2300	Engineering Thermodynamics	
or IMSE 2710	Engineering Economic Analysis	
CMP_SC 1050	Algorithm Design and Programming I	3
CMP_SC 2050	Algorithm Design and Programming II	3
ECE 4220	Real Time Embedded Computing	3
ECE 1000	Introduction to Electrical and Computer Engineering	2
ECE 1210	Introduction to Logic Systems	3
ECE 2100	Circuit Theory I	4
ECE 3210	Microprocessor Engineering	4
ECE 3810	Circuit Theory II	4
ECE 3830	Signals and Linear Systems	3
ECE 3410	Electronic Circuits and Signals I	4
ECE 3110	Electrical and Computer Engineering Projects	3
ECE 3220	Computing for Embedded Systems	3
ECE 4250	VHDL and Programmable Logic Devices	4
ECE 4270	Computer Organization	4
ECE 4970	Senior Capstone Design	3

#### Electives

3000+ ECE or CMP_SC Elective	9
ECE 4000+ Technical Elective	6
Any Elective	3

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CHEM 1320	4	CMP_SC 1050	3
ECE 1000	2	ECE 1210	3
MATH 1500	5	ENGLSH 1000	3
Constitutional Requirement	3	MATH 1700	5
Humanities/Fine Arts Elective	3	Humanities/Fine Arts Elective	3
	17		17
Second Year			
Fall	Credits	Spring	Credits
ECE 2100	4	CMP_SC 2050	3
ECE 3210	4	ECE 3810	4
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	PHYSICS 2760	5
	16		15
Third Year			
Fall	Credits	Spring	Credits
ECE 3220	3	ECE 4250	4
ECE 3410	4	ENGINR 1200, 2300, or IMSE 2710	3
ECE 3830	3	Flexible Technical Elective	3

STAT 4710	3	Flexible Technical Elective	3
MATH 2320	3	Social/Behavioral Elective	3
	<b>16</b>		<b>16</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ECE 3110	3	ECE 4970 (WI)	3
ECE 4270	4	Flexible Technical Elective	3
ECE 4220 or CMP_SC 4520	3	4000+ Technical Elective	3
ECE 4000+ Technical Elective	3	Humanities /Fine Arts Elective	3
Social/Behavioral Science Elective	3	Free Elective	1
	<b>16</b>		<b>13</b>
Total Credits: 126			

## Graduate

### MS in Computer Engineering

#### Admission

349 Engineering Building West, Columbia, MO 65211  
 Phone: 573-882-4436  
 Email: [umcengreogradoff@missouri.edu](mailto:umcengreogradoff@missouri.edu)  
<http://engineering.missouri.edu/ece/>

#### Admission Criteria

Fall deadline: February 15  
 Spring deadline: September 1  
 Note: Applications received after these deadlines will be evaluated as time allows.

- Minimum GPA: 3.0 for the last 60 hours
- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	80th percentile	will be considered	will be considered
On or After August 1, 2011	80th percentile	will be considered	will be considered

International applicants only:

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum Academic IELTS scores:

Item	Score
Listening	5.5
Reading	5.5
Writing	5.5
Speaking	5.5

Required Application Materials:

- Statement of Purpose (upload to the Supplemental information section of the application)

- Copies of your official transcripts (upload to the Educational History section of the application)
- Copies of your GRE scores (upload to the Test Information section of the application)
- Copies of your TOEFL or IELTS Scores (for non-native English speakers only) (upload to the Test Information section of the application)
- 3 letters of Recommendation (the department accepts electronic recommendations – in the recommendation section of the online application, enter the information for three recommenders. Each recommender will receive an email with instructions on how to complete the recommendation). The department does also accept hard copy letters of recommendation. The letters may be mailed to: Graduate School, 210 Jesse Hall, Columbia, MO 65211.

To the Graduate School:

Official Transcripts. The mailing address is: Graduate School, 210 Jesse Hall, Columbia, MO 65211.

Note: when registering for GRE or TOEFL exams, be sure to designate your program of interest at the University of Missouri – Columbia. MU's Institutional Code is 6875 (no departmental code is necessary).

#### Admissions Criteria for the MS in Electrical or Computer Engineering

To be accepted outright by the director of graduate studies (DGS), the student needs to have a BS degree in either Electrical Engineering or Computer Engineering in addition to meeting the above requirements. Students who meet the academic requirements but have degrees in other engineering or science disciplines can be accepted directly into the MS program by the graduate program committee (GPC). Such students are strongly encouraged to consult with the DGS or their advisor about appropriate bridge courses. Based on individual circumstances, students may be advised to register as an undeclared graduate student to fill in background course work prior to admission into the department.

Students who do not meet the above requirements may still be admitted on probation by the GPC if there are mitigating factors. Students admitted on probation must receive at least a 3.0 GPA for the first 12 hours of graded graduate coursework completed in their first two semesters. Failure to achieve this GPA will result in expulsion from the ECE MS program.

#### Appeal Process

All students have the right to a timely formal appeal to the GPC. Upon receipt of an admission decision or disciplinary action, the student has 10 working days in which to request a formal appeal. The DGS will convene a meeting of the GPC, the student, and the student's advocate (if appropriate) within 10 working days of receiving the request. The decision of the GPC at the hearing is final.

#### Degree Requirements

To fulfill the requirements for the MS degree, the following rules apply:

- A candidate must complete 30 hours, including at least 12 hours of 8000-level graded course work (exclusive of ECE 8990 or ECE 8085 or ECE 8010 hours).
- At least six of these graded 8000 level course hours need to come from ECE.

- At least 15 hours of graded course work (total combination of 7000 and 8000 level courses, exclusive of ECE 8990, ECE 8085, or ECE 8010 hours) must be taken from the Electrical and Computer Engineering Department course offerings.
- A maximum of six hours of graduate credit may be transferred from another campus in the University of Missouri System or other university, while a maximum of eight hours of graduate credit may be used from a previous MU master's degree.
- At most, three hours of course work in supervised study (ECE 8010) may be taken during the MS program and they will be graded on an S/U basis.
- At least one course from each of three different emphasis areas must be taken; a minimum of two of the emphasis areas must be in Electrical and Computer Engineering. (Each ECE graduate course is designated to an emphasis area. Contact the ECE graduate office for a current list).
- A minimum of 3 hours to a maximum of 6 hours of research (ECE 8990) or problems (ECE 8085) are required, based on whether the student writes a master's thesis or a master's Report.
- The student's cumulative GPA must be at least 3.0 to graduate.

The requirements for the MS degree must be met within an eight year period. Each candidate must pass a final oral examination to demonstrate mastery of the work included in the thesis or in a substantial independent project. These MS requirements apply to ECE graduate students first enrolled in MU ECE in the Fall semester 2007 or later. UM ECE graduate students enrolled prior to Fall semester 2007 may choose to follow the MU ECE MS requirements that were in effect for their MU ECE graduate admission semester.

## Academic Probation

A student whose GPA drops below 3.0 is automatically placed on academic probation. In such a case, the student has one semester to raise his or her cumulative GPA to 3.0. Failure to do so will result in expulsion from the program. Additionally, a student who receives the grade of "C" in 9 hours of coursework will be expelled. As with acceptance, students here also have a right to the same formal appeal process described above.

## Selection of an Advisor

Students must choose an academic advisor who will then provide guidance for the selection of coursework, and in the choice and execution of a research question. The student's academic advisor and the Director of Graduate Studies must approve all coursework used to satisfy the credit hour requirements for this degree. After performing satisfactorily for a minimum of one semester, the student, with the adviser's assistance, completes the Program of Study form that outlines the plan of study for the student's graduate program. M1 - Program of Study form.

The form is forwarded through the DGS to the Graduate School for approval. In the event that an adviser retires or leaves MU, he/she may continue to serve as the student's main adviser unless there is written academic program policy prohibiting such an arrangement. If an adviser is unable or unwilling to continue to serve, the academic program, with the leadership of the DGS, will assist the student to ensure that a replacement is found.

The Program of Study form must be filed with the Graduate School by the end of the student's second semester of enrollment. Upon approval of the program by the Graduate School, the student is a candidate for the

degree. If changes must be made on a student's Program of Study form, a Program of Study Substitution form is used.

## Thesis Option

For students under the thesis option of the MS degree, i.e., students enrolling for ECE 8990, an M-2 Request for Thesis Committee form is required to be submitted for approval by the department DGS and the Graduate School by the end of the student's second semester.

A thesis committee is composed of three members of the MU faculty: a major adviser from the academic program, a second reader from the academic program, and an outside reader who is a member of the graduate faculty from a different MU graduate program. Upon approval of the department DGS, the student may petition the Graduate School to allow a person who is not a member of the MU graduate faculty to serve as the third reader. The petition should include a written justification for such a request and a copy of the person's curriculum vitae. The Graduate School maintains copies of curriculum vitae previously received and approved, and if such a request is anticipated, the student should contact the Graduate School to see if the curriculum vita of a particular person is already on file. Students need to supply committee members with copies for review/evaluation at least one week prior to the defense date.

Information about submitting the thesis can be found in the Thesis and Dissertation Guidelines.

## Non-Thesis Option

For students who enroll in ECE 8085 (Problems), a problem report rather than a thesis is required. The student is not required to submit the M-2 form (request for a thesis committee). Instead, the student must have the report approved by his or her advisor and two other members of the graduate faculty, forming the student's Problem Committee. It is not required that a member outside of ECE be included, although it is permissible for such a member of the MU graduate faculty to be appointed. At least one of the three members must have a primary academic appointment in ECE. Students need to supply committee members with copies for review /evaluation at least one week prior to the defense date. At that time, an announcement is to be made to the department faculty and graduate students to allow them to attend the defense. The student must defend the problem report to the committee, and make any needed adjustments in format and corrections/clarifications based on input from the committee. A final copy of the problem report must be filed with the ECE graduate office.

## Report of the Master's Examining Committee

The purpose of the M-3 Report of the Master's Examining Committee Form is to have an official record of the final examining process, whether it is a thesis defense or presentation of a report. The student's committee will indicate on this form if the student has passed the final exam. This form must be submitted to the Graduate School by a deadline for the semester in which the students plan to graduate. For a report option, the 3rd reader of the committee may be from the student's department. The form is due in the Graduate School two weeks prior to graduation.

## Computer Science

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Dong Xu, Chair  
College of Engineering (BS in Computer Science, BS Information Technology, MS Computer Science, Master of Engineering, PhD Computer Science)  
College of Arts and Science (BA in Computer Science)  
201 Engineering Building West  
(573) 884-1887  
engineering.missouri.edu/cs

### About Computer Science Programs

The Department of Computer Science is a fast-growing and research-active entity at the University of Missouri. In fact, it is the hub of all campus computer science activities that involve well established research programs in computational biology and bioinformatics, cyber-security, distributed and mobile computing, geospatial information mining and retrieval, intelligent systems, multimedia communications, large dataset scientific visualization, networking, spoken language processing and human-machine interfaces, wireless sensor networks, etc.

The Department offers masters, dual masters, and doctoral degrees. The graduate degree programs prepare prior recipients of four-year BS degrees in computer science or closely related areas for further study at the doctoral level or for successful careers as specialized computer professionals. The PhD programs are a professional research degree designed to prepare students for advanced professional careers, including college teaching and research, as well as research and development in industrial, government, and nonprofit organization. Specialized training is available through close interaction with the faculty in their active research fields.

The faculty members of the Department of Computer Science participate in the full spectrum of undergraduate and graduate education. Graduate education, in addition to direct involvement in projects funded by the federal government and industries, places equal emphasis on interdepartmental and cross-college research. The aim is to produce computer scientists who can function well in interdisciplinary research teams. Close integration of research with education is an invariant goal in the department's graduate programs. It emphasizes in-depth studies that can also be tailored to fit graduate students' individual interests. Additionally, members of the department lead the University's institutional efforts in developing infrastructure for bioinformatics, computational biology, and high-performance computing and networking. Our major research projects are heavily funded by both federal agencies and industries. While National Science Foundation (NSF), National Institute of Health (NIH), National Geospatial-Intelligence Agency (NGA), Department of Energy (DoE), and Department of Defense (DoD) are examples for federal funding, Microsoft and Monsanto are representatives for industrial funding.

Research facilities are well established around faculty members' expertise in bioinformatics and computational biology, biological and biomedical image analysis, graphics, mobile computing, artificial intelligence, multimedia, networking, human-computer interaction, information management systems, and computer science foundations. These facilities are clustered in core laboratories for bioinformatics, multimedia and visualization, video processing, spoken-language processing, mobile networking and communications, wireless sensor

networks, high-performance computing, cyber security, and medical informatics.

### Careers

The graduate degree programs prepare prior recipients of four-year B.S. degrees in computer science or closely related areas for further study at the doctoral level or for successful careers as specialized computer professionals.

The Ph.D. programs are a professional research degree designed to prepare students for advanced professional careers, including college teaching and research, as well as research and development in industrial, government, and nonprofit organization. Specialized training is available through close interaction with the faculty in their active research fields.

With foundations covered in algorithms, compilers, computational theories, database, networking, operating systems, programming languages and software engineering, the undergraduate and graduate programs are integrated over many application areas such as:

- cyber-security
- multimedia
- smartphone applications
- filming
- mobile and sensor networks
- information management systems
- bioinformatics and computational biology
- medical informatics

### Research

This department is the hub of all campus computer science activities that involve well established research programs in:

- bioinformatics and computational biology
- graphics and image processing
- geospatial information mining and retrieval
- cyber-security
- multimedia communications and networking
- ambient intelligence and sensor networks
- mobile and distributed computing
- spoken language processing and human-machine interfaces, etc.

Additionally, members of the department lead the University's institutional efforts in developing infrastructure for bioinformatics, computational biology and high-performance computing and networking.

### Faculty

**Professor** Y. Shang\*\*, C. R. Shyu\*\*, D. Xu\*\*, W. Zeng\*\*, Y. Zhao\*\*, X. Zhuang\*\*

**Associate Professor** J. Cheng\*\*, Y. Duan\*\*, W. L. Harrison\*\*, M. Jurczyk\*\*, T. Kazic\*\*, K. Palaniappan\*\*, Y. Saab\*\*, G. K. Springer\*\*, J. Uhlmann\*\*

**Assistant Professor** P. Calyam\*\*, R. Chadha\*\*, D. Korkin\*\*

**Associate Teaching Professor** D. Musser\*

**Adjunct Professor** J. M. Keller\*\*, S. Nair\*\*, M. Skubic\*\*

**Adjunct Associate Professor** G. DeSouza\*\*

**Adjunct Assistant Professor** M. Becchi\*\*, M. Popescu\*\*



- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 426)
- BS in Computer Science (p. 426)
- Minor in Computer Science (p. 428)

### Advising Contact

Adrianna Wheeler  
113 EBW  
(573) 884-6342  
wheeleral@missouri.edu

### Scholarship Information Contact

Dr. Michael Jurczyk  
121 EBW  
(573) 884-8869  
jurczyk@missouri.edu

The Department of Computer Science offers a broad curriculum that spans the theory, design and applications of computing and information technology. The Bachelor of Science degree in Computer Science includes a strong component of mathematics and sciences along with more theoretical courses in computer science. The Bachelor of Science in Information Technology is application-oriented, and allows students to develop skills in database administration, cyber security, game development and film production. The Bachelor of Arts degree, offered by the College of Arts and Science, includes computer science courses and encourages students to develop skills in related fields in areas such as computer animation, business, art, music and geography. Computer Science and Information Technology minors are available.

The College of Arts and Science also offers a BA in Computer Science (p. 170).

## Graduate

Department of Computer Science  
201 Engineering Building West  
University of Missouri  
Columbia, MO 65211  
<http://engineering.missouri.edu/cs/>

Director of Graduate Studies: Yi Shang

Graduate Advisor: Jodie Lenser  
244 Engineering Bldg West  
573-882-7037  
LenserJ@missouri.edu

- MS in Computer Science (p. 429)
- PhD in Computer Science (p. 429)

## MS and PhD Admission Criteria

Students applying to the CS graduate program must have a sufficient background in mathematics and computer science to be able to enroll in and perform satisfactorily in the CS courses numbered 7000 and

above. Students applying for admission must fulfill the following minimum requirements that include material contained in specific CS courses or their equivalent taken at another institution. It is preferred that students have earned a BS degree in Computer Science. However, students from other disciplines meeting the minimum requirements will be considered for admission.

1. Proficiency in a procedural programming language equivalent to that gained by taking CMP\_SC 1050 Algorithm Design and Programming I and CMP\_SC 2050 Algorithm Design and Programming II. The preferred programming language is Java. This material includes fundamental algorithm design and data structures.
2. Three semesters of formal course work in Calculus (MATH 1500, MATH 1700 and MATH 2300 at MU).
3. Knowledge of statistics equivalent to that contained in STAT 4710 Introduction to Mathematical Statistics.
4. Knowledge of discrete mathematical structures equivalent to that covered in MATH 2320 Discrete Mathematical Structures.
5. Knowledge of computer system architecture equivalent to that contained in CMP\_SC 3270 Introduction to Digital Logic and CMP\_SC 3280 Computer Organization and Assembly Language.
6. Four courses with grades B or better equivalent to those defined as follows:
  - A. CMP\_SC 4050 Design and Analysis of Algorithms I
  - B. CMP\_SC 4320 Software Engineering I
  - C. CMP\_SC 4410 Theory of Computation I, CMP\_SC 4430 Compilers I, or CMP\_SC 4450 Principles of Programming Languages
  - D. CMP\_SC 4520 Operating Systems I
7. A GPA of at least 3.0 (A=4.0) for the last half of the undergraduate curriculum.
8. Acceptable Minimum GRE scores (taken within last 5 years): 25 percentile on the verbal part, 80 percentile on the quantitative part, and 4 on the analytical writing part.
9. For those not schooled in English as their native language, a recommended minimum TOEFL score (taken within last two years):

Internet-based test (iBT)	Paper-based test (PBT)
90	577

OR

Item	Score
IELTS	6.5-7.0

10. For admission into the PhD program, the student must have either:
  - A. A Bachelor's degree in Computer Science with a GPA of 3.4 (out of 4.), or
  - B. An equivalent of a Master's degree in Computer Science, or a closely related field, with a GPA of least 3.4 (out of 4.0).

## Application Procedures

In order to be considered for admission in a particular semester we must receive all required paperwork by these deadlines:

**Fall admission:** Applications and all paperwork must be received by March 1st. NOTE: If applying for financial assistance in the department, applications and all paperwork must be received by January 15th.

**Spring admission:** Applications and all paperwork must be received by October 1st.

Application for admission involves submitting a formal application through the Graduate School's Apply Yourself (<http://gradschool.missouri.edu/admissions/apply>) online application system. An application must be accompanied by an application fee. In addition, the applicant must have the following original paperwork sent directly from the originating institutions to the Graduate School:

- Official transcripts from ALL institutions attended
- Official GRE score report from Educational Testing Service in New Jersey (and TOEFL or IELTS scores for international applicants)

The following supplemental materials must be uploaded in the online application:

- Your resume
- A personal goal statement indicating why you feel prepared to pursue the degree program and why you want to pursue this degree (uploaded in your online application)
- Minimum course requirement form if you do not have a BS in computer science (uploaded in your online application)
- Three letters of recommendation from professors who know your abilities that must address your ability and readiness to pursue a graduate program in computer science (submitted by your references directly to your online application)

Note: Copies of the required documents (transcripts, GRE scores, etc.) cannot be accepted in lieu of the official reports from the originating institutions. Copies of these records can be submitted for evaluation, but any decision on admission is non-binding until the official records have been received.

**Current/Former MU students:** All current and former MU students must meet the same requirements as external students *and* file one of the following forms (in lieu of an MU Application Form):

- Current Non-Degree Graduate Students: Change of Division, Degree, Program, Emphasis, or Advisor form,
- Current graduate students in another department: Change of Division, Degree, Program, Emphasis, or Advisor form (same as 1)
- Previous graduate students returning to same program: Re-Activation form.

Forms can be obtained from the Computer Science Graduate Advisor's office in 244 EBW or the Graduate School, 210 Jesse Hall.

## Degree Completion Requirements

Use the links at the top of the page to direct you to details on the requirements that must be completed in order to earn the respective graduate degrees from the CS department. The Master of Science degree program has both a thesis and a non-thesis option, which can be chosen by the student after consultation with their selected advisor.

## Credit toward a Second Master's Degree

A student who has completed one Master's degree at MU or elsewhere may present, upon the recommendation of the student's advisor and approval by the Director of Graduate Studies and the Graduate School, a maximum of six hours of credit earned in the previous program toward a second Master's degree.

## Master of Engineering Degree

A student may also choose to complete a Master of Engineering (p. 442) degree. The requirements for the ME degree are the same as the MS CS with the following exceptions: 1) the student must complete

at least 36 hours of graduate courses, 2) a minimum of 30 credit hours must be earned from UM System institutions, 3) at least 21 hours must be courses offered by the CS Department, 4) at least 15 hours must be 8000 level courses offered by CS Department (excluding CMP\_SC 8085), 5) CMP\_SC 8980, CMP\_SC 8990 and CMP\_SC 9990 may not be taken, 6) at most 3 hours of CMP\_SC 8085 may be taken, 7) no final examination is required. Entrance requirements for ME and MS degree are the same. Students must decide on either MS or ME when they apply.

## Financial Aid

Teaching and research assistantships are available for qualified students in the graduate programs. The Department also offers fellowships (including US Department of Education GAANN Fellowships and Shumaker Bioinformatics Fellowships) to a limited number of new PhD students. In addition, there are other fellowships and scholarships available at the university level.

Teaching assistantships and research assistantships are available with tuition waivers in the Department. Requests for financial aid are examined at the same time as those for graduate admission, which are due before January 15 for fall semester and October 1 for spring semester.

## Student Group

The department's graduate enrollment is about 120, with approximately half enrolled in the PhD program. Advised by the Director of Graduate Studies, the CS Graduate Student Council is an active body that works with the department and provides social support as well as student input for the continuous improvement of the graduate programs in computer science.

## Undergraduate

### Department Level Requirements - Computer Science

The Department of Computer Science has no department level requirements. All requirements are listed on the individual degree program pages.

## BS in Computer Science

### Major Program Requirements

The Bachelor of Science with a major in Computer Science emphasizes the study of software systems and graphics, computational theories and algorithms, computer organization, networking and multimedia, and programming methodology. Students who complete the BS in Computer Science can work for government agencies, academic institutions, or private industry creating and applying new technologies to solve complex problems.

The BS degree requires the completion of the three-semester calculus sequence plus discrete math and statistics. A student who selects an appropriate additional math course as a technical elective and has at least 9 credits in math with appropriate grades at MU can earn a math minor.

The BS degree requires the completion of 126 credits. To graduate, a student must earn a 2.0 GPA or better in all CMP SC/IT courses. A grade

of C- or better is required in each CMP SC course that is a prerequisite for a CMP SC course that the student takes.

The Engineering Career Services Office, W1052C Lafferre Hall, can assist students in searching for employment opportunities upon graduation and for internship/co-op positions.

Course requirements listed here apply to students beginning as regular college freshmen in Fall 2013 or after. A student who started college before Fall 2013 and who has been continuously enrolled as a full-time student may be pursuing the previous program and should contact the department for information on these degree requirements.

In addition to the major core requirements, students must complete all University graduation requirements including University general education (p. 18), as well as all degree and college or school requirements.

## Major Core Requirements

### Computer science courses

CMP_SC 1000	Introduction to Computer Science	1
CMP_SC 1050	Algorithm Design and Programming I	3
CMP_SC 2050	Algorithm Design and Programming II	3
CMP_SC 3050	Advanced Algorithm Design	3
CMP_SC 3270	Introduction to Digital Logic	3
CMP_SC 3280	Computer Organization and Assembly Language	3
CMP_SC 3330	Object Oriented Programming	3
CMP_SC 3380	Database Applications and Information Systems	3
CMP_SC 4050	Design and Analysis of Algorithms I	3
CMP_SC 4320	Software Engineering I	3
CMP_SC 4520	Operating Systems I	3
CMP_SC 4850	Computer Networks I	3
CMP_SC 4970	Senior Capstone Design I	3
CMP_SC 4980	Senior Capstone Design II	2

### CMP SC courses chosen from the following list <sup>1</sup> 21

CMP_SC 2830	Introduction to the Internet, WWW and Multimedia Systems	
CMP_SC 3530	UNIX Operating System	
CMP_SC 3940	Internship in Computer Science	
CMP_SC 4001	Topics in Computer Science	
CMP_SC 4060	String Algorithms	
CMP_SC 4070	Numerical Methods for Science and Engineering	
CMP_SC 4085	Problems in Computer Science	
CMP_SC 4270	Computer Architecture I	
CMP_SC 4330	Object Oriented Design I	
CMP_SC 4380	Database Management Systems I	
CMP_SC 4410	Theory of Computation I	

CMP_SC 4430	Compilers I	
CMP_SC 4450	Principles of Programming Languages	
CMP_SC 4610	Computer Graphics I	
CMP_SC 4620	Physically Based Modeling and Animation	
CMP_SC 4650	Digital Image Processing	
CMP_SC 4670	Digital Image Compression	
CMP_SC 4720	Introduction to Machine Learning and Pattern Recognition	
CMP_SC 4730	Building Intelligent Robots	
CMP_SC 4750	Artificial Intelligence I	
CMP_SC 4770	Introduction to Computational Intelligence	
CMP_SC 4830	Science and Engineering of the World Wide Web	
CMP_SC 4995	Undergraduate Research in Computer Science - Honors	

### Related courses 22

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 2320	Discrete Mathematical Structures	3
STAT 4710	Introduction to Mathematical Statistics	3

### Technical elective <sup>2</sup> 3

### Science courses (choose one of the following four sequences) <sup>minimum</sup> 12

#### Physics sequence:

(credit not given for both PHYSCS 1210 and PHYSCS 2750, or PHYSCS 1220 and PHYSCS 2760)

PHYSCS 1210 & PHYSCS 1220	College Physics I and College Physics II	8
PHYSCS 2750 & PHYSCS 2760	University Physics I and University Physics II	10

#### Chemistry sequence:

CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4

#### Biology sequence:

BIO_SC 1010	General Principles and Concepts of Biology	3
BIO_SC 1020	General Biology Laboratory	2

Select one of the following:

BIO_SC 1200	General Botany with Laboratory	
BIOCHM 2110	The Living World: Molecular Scale	
BIOCHM 2112	Biotechnology in Society	
ANTHRO 2050	Introduction to Biological Anthropology with Laboratory	

OR

ANTHRO 2051 & ANTHRO 2052 Introduction to Biological Anthropology and Biological Anthropology Laboratory

BIO\_SC 2100 Infectious Diseases

BIO\_SC 2600 Ornithology

BIO\_SC 3050 Genetics and Society

BIOCHM 3630 General Biochemistry

BIO\_SC 3210 Plant Systematics

**Geology sequence:**

GEOL 1100 Principles of Geology with Laboratory 4

or GEOL 1200 Environmental Geology with Laboratory

Select one of the following:

GEOL 2150 The Age of the Dinosaurs

GEOL 2200 Oceanography

GEOL 2300 Earth Systems and Global Change

GEOL 2350 Historical Geology

GEOL 2400 Surficial Earth Processes and Products with Laboratory

GEOL 3110 & GEOL 3115 Geology of Missouri and Geology of Missouri Laboratory

**Additional courses to complete 12 credits in science**

ASTRON 1010 Introduction to Astronomy 4

ASTRON 1020 Introduction to Laboratory Astronomy 2

Any science sequence courses outside the student's selected sequence.

Any biology, biochemistry, chemistry, geology, or physics courses beyond the levels listed above.

Other science courses pre-approved by the advisor.

**Non-Science Electives 9**

Students must complete 9 hours of non-science electives which include courses in business, education, or additional social, behavioral or humanities courses beyond what is required in those categories.

<sup>1</sup> At least 15 credit hours of computer science electives must be numbered above 4000; two of the 4000-level courses must be CMP\_SC 4410, CMP\_SC 4430, or CMP\_SC 4450. A maximum of 6 hours of IT courses can be taken as CS electives with the following stipulations: One 3000/4000 level INFOTC course (excluding IT 4400 and 4500) can be taken as a CMP\_SC elective but it is counted as a lower level (below 4000) CMP\_SC course. IT 4400 and 4500 are counted as CS 4000 level courses.

<sup>2</sup> 2000-level or above CMP\_SC course or 4000-level MATH course, 2000-level or above engineering courses, MANGMT 3000, FINANC 3000 or other courses that meet prior approval of Computer Science advisor. An INFOTC course at the 2000 level or above can be taken. Students cannot take INFOTC 2810 or INFOTC 2910 as a technical elective if they have already taken CMP\_SC 4850.

<sup>3</sup> Including one of the two-semester sequences below. At least one of the courses must include a lab. Labs listed separately are not considered a second science course (for example, BIO\_SC 1010 and BIO\_SC 1020 equal one science course).

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CMP_SC 1000	1	CMP_SC 2050	3
CMP_SC 1050	3	MATH 1700	5
MATH 1500	5	ENGLISH 1000*	3
Constitutional/State Law Elective*	3	Behavioral Science*	3
Non Science Elective	3	Humanities/Fine Arts*	3
	15		17
Second Year			
Fall	Credits	Spring	Credits
CMP_SC 3330	3	CMP_SC 3050	3
COMMUN 1200*	3	CMP_SC 3270	3
MATH 2300	3	MATH 2320	3
Non Science Elective	3	Science Sequence	5
Science Sequence	5	CMP SC Elective	3
	17		17
Third Year			
Fall	Credits	Spring	Credits
CMP_SC 3280	3	CMP_SC 4050	3
CMP_SC 3380	3	CMP_SC 4320	3
CMP SC Elective	3	CMP_SC 4410, 4430, or 4450	3
STAT 4710	3	Science Elective	3
4000-level CMP SC Elective	3	Social / Behavioral Science*	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
CMP_SC 4970	3	CMP_SC 4520	3
CMP_SC 4410, 4430, or 4450	3	CMP_SC 4850	3
4000-level CMP SC Elective	3	CMP_SC 4980	2
Humanities/Fine Arts*	3	4000-level CMP SC Elective	3
Technical Elective	3	Non Science Elective	3
		General Elective	1
	15		15
Total Credits: 126			

\* Denotes General Education Requirements

## Minor in Computer Science

A minor in computer science is offered through the College of Engineering. To obtain a minor, a student must complete 18 hours of courses approved by the Department of Computer Science. The student must earn a grade of C- or better in each course counting toward the minor and have a 2.0 GPA in all courses counting toward the minor.

At least 9 hours must be taken in residence. The following courses are required.

CMP_SC 1050	Algorithm Design and Programming I	3
CMP_SC 2050	Algorithm Design and Programming II	3
CMP_SC 3270	Introduction to Digital Logic	3
Three additional department-approved CMP SC courses with at least one numbered above 3000		9
Total Credits		18

## Graduate

### MS in Computer Science

All students completing a master's degree must fulfill the following minimum requirements:

1. The student must earn a minimum of 30 credit hours of course work approved by the CS Department. This course work must include at least 15 credit hours of course work numbered 8000 or above (CMP\_SC 8990 Research-Masters Thesis Computer Science credit is counted in the required 15 credit hours, but CMP\_SC 8980 is not).
2. The overall GPA of course work taken as an enrolled graduate student must be at least 3.0 (out of 4.0).
3. Courses taken in other departments (up to 6 credit hours) will be considered for approval as part of a student's MS program and the approval is sought prior to the student undertaking the course work.
4. A 4000-level course listed in the minimum requirements for graduate admission cannot be taken at the equivalent 7000 level as part of the required hours for the MS, ME, or PhD programs.
5. Non-Thesis Option:

In order to complete the non-thesis option, the student must complete an independent project under a faculty adviser approved by the department. This project is carried out by enrolling in CMP\_SC 8980 (Non-Thesis Research) for at least one hour of credit. This project is documented and presented to a faculty committee of at least three graduate faculty members and defended in a public defense as part of a final oral examination. The CMP\_SC 8980 course grade is assigned by the student's faculty adviser upon the conclusion of the oral examination. This course is graded on an S/U basis and cannot be used to increase the student's overall GPA in graduate work. In this option, at most, 3 credit hours of Research, Reading, and/or Problem courses (such as CMP\_SC 8980, CMP\_SC 8990, CMP\_SC 8085) can be counted toward the 30-hour MS graduate requirements.

6. Thesis Option:

In order to complete the thesis option, the student must complete an independent project under a faculty adviser approved by the department. This project is carried out by enrolling in CMP\_SC 8990 (Thesis Research) for at least three hours of credit. A maximum of six credit hours of CMP\_SC 8990 can be counted toward the required 30 credit hours for the MS degree program. The thesis project is documented in a formal thesis, presented to a faculty committee of at least three graduate faculty members (one of whom is a faculty member from another department) and defended in a public defense as part of a final oral examination. The CMP\_SC 8990 course grade(s) is/are assigned by the student's

faculty advisor upon the conclusion of the oral examination.

CMP\_SC 8990 is graded on an S/U basis and cannot be used to increase the student's overall GPA in graduate work. In this option, at most 9 credit hours of Research, Reading, and/or Problem courses (such as CMP\_SC 8980, CMP\_SC 8990, CMP\_SC 8085) can be counted toward the 30-hour MS graduate requirements.

7. Seminar Attendance: The approval of the M3 form is tied to the attendance records for the department's seminar series. MS and ME students are required to attend a total of at least ten CS approved seminars during the course of their Master's program. Approved seminars include all CS Seminar Series presentations, Dr. Harrison's Security Reading Group meetings, and others as announced. Master's students who add the PhD program can apply up to ten seminars attended as part of their Master's program toward the attendance requirement (twenty) for doctoral students.
8. M Forms: By the end of the second semester in the program, the M1 Plan of Study form should be prepared and submitted, with the aid of a faculty adviser in the department. An adviser should be selected during the student's first semester. If a thesis option is chosen, the student should form a thesis committee and submit the M2 Request for Thesis Committee form. The M3 Report of Master's Examining Committee form is submitted after the thesis or project defense during the final semester.
9. Annual Review Requirement of the Graduate School. All graduate students are required to complete the Annual Review Requirement by updating their information in the Graduate Student Progress System by the end of their second, fourth, etc. semesters of their program. The CS department requires that this report be approved online by the student's faculty adviser, and a printed copy attached to each M form before being signed by the CS Director of Graduate Studies.

### PhD in Computer Science

All students completing a PhD degree must fulfill the following minimum requirements:

1. Complete all of the course work requirements of the Master's degree in CS or have an MS degree in CS from another institution. The student must have maintained an overall GPA of at least 3.4/4.0 in their prior graduate level course work (excluding research and problems courses).
2. Pass a qualifying examination to be admitted to candidacy in the CS PhD program.
3. Earn a minimum of 72 credit hours of course work and research past the student's Bachelor's degree.
4. Pass a comprehensive examination covering their areas of expertise.
5. Complete a doctoral dissertation on a topic approved by the candidate's advisory committee.
6. Defend the dissertation in a final oral examination.
7. Have at least one journal paper submitted, accepted or published, as approved by the adviser.
8. Present on a research topic as part of the CS Seminar Series at some point between passing the qualifying exam and the dissertation defense. This policy is effective for entering PhD students in Spring 2013 and after.

9. Seminar Attendance: The approval of the D4 form is tied to the attendance records for the department's seminar series. PhD students are required to attend a total of at least twenty CS approved seminars including all CS Seminar Series presentations, Dr. Harrison's Security Reading Group meetings, and others as announced. Master's students who add the PhD program can apply up to ten seminars attended as part of their Master's program toward the attendance requirement for doctoral students.
10. D Forms: After the successful completion of the Qualifying Examination - by or before the end of the third year in the program - the D1 Qualifying Exam Results & Doctoral Committee Approval form should be submitted to the Graduate School, followed by the D2 Plan of Study for the Doctoral Degree form. The D3 form Doctoral Comprehensive Examination Results is submitted when the student has completed the Comprehensive Exam. Graduate School policy requires the completion of the Comp Exam within five years of starting the PhD program. At least seven months must pass between the Comp Exam and the dissertation defense, which is followed by submission of the D4 Dissertation Defense form.
11. Annual Review Requirement of the Graduate School: All graduate students are required to complete the Annual Review Requirement by updating their information in the Graduate Student Progress System by the end of their second, fourth, etc. semesters of their program. The CS Department requires that this report be approved online by the student's faculty adviser and a printed copy attached to each D form before being signed by the CS Director of Graduate Studies.

\*Students cannot take CMP\_SC 9990 before passing the PhD qualifying exam. Pre-Qual students should take CMP\_SC 8990 for Research credit.

## Electrical and Computer Engineering

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S. Kovaleski, Interim Chair  
College of Engineering  
349 Engineering Building West  
(573) 882-6387  
KovaleskiS@missouri.edu

The Department of Electrical & Computer Engineering is one of 9 academic departments within the College of Engineering at the University of Missouri.

Established in 1884 as the first electrical engineering program in the nation, this ABET accredited program is now home to more than 300 undergraduate students, almost 150 graduate students and 21 faculty members.

### Faculty

**Professor** R. D. Curry\*\*, C. H. Davis\*, J. M. Gahl\*\*, S. Gangopadhyay\*\*, D. K. C. Ho\*\*, N. E. Islam\*\*, J. M. Keller\*, N. D. Manring\*, S. Nair\*\*, R. M. O'Connell\*\*, M. Skubic\*\*, J. E. Thompson\*, H. W. Tyrer Jr.\*\*

**Associate Professor** M. Almarsri\*\*, G. DeSouza\*\*, T. G. Engel\*, Z. He\*\*, S. D. Kovaleski\*\*, J. W. Kwon\*\*, J. J. Legarsky\*\*, G. Triplett\*\*

**Assistant Professor** M. Becchi\*\*, T. Han\*\*, C. Xiao\*, A. Zare\*\*

**Professor Emeritus** L. A. Akers\*, M. J. Devaney\*\*, R. W. McLaren\*, B. W. Sherman, K. Unklesbay

**Associate Professor Emeritus** R. W. Leavene Jr.\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

The University does not offer an undergraduate degree in the combined areas of Electrical and Computer Engineering. See Electrical Engineering (p. 435) and Computer Engineering (p. 418) for details on the undergraduate degree programs.

### Graduate

349 Engineering Building West  
Columbia, MO 65211  
Phone: 573-882-4436  
Email: [umcengrecegradoff@missouri.edu](mailto:umcengrecegradoff@missouri.edu)  
<http://engineering.missouri.edu/ece/>

**Director of Graduate Studies:** James Keller

- PhD in Electrical and Computer Engineering (p. 432)

The Department also offers an MS in Computer Engineering (p. 422), an MS in Electrical Engineering (p. 439), and the College offers an interdepartmental ME in Engineering with a focus in Computer and Electrical Engineering (p. 442).

Established in 1885, the Department of Electrical & Computer Engineering has a long tradition of excellence. Our classes are small with extensive design and laboratory experimentation. Research opportunities exist for both undergraduate and graduate students in Communication and Signal Processing, Physical Electronics, Intelligent Systems, Systems Modeling and Control, Nano and Micro Electronics, and Digital / Computer Systems.

### Career Opportunities

Throughout the 20th century, the electrical engineering and computer engineering professions devised many of the innovations that dominated the technology landscape. In the 21st century, electrical and computer engineers will be at the forefront of a wide spectrum of technologies including nanotechnology, biotechnology, sensors, power generation, electric vehicles, and telecommunications.

### Areas of Study

**Communications and Signal Processing.** Satellite remote sensing, geospatial intelligence, image/video processing, land-mine detection, speech signal processing, wireless communications, underwater communications.

**Physical Electronics.** Medical applications and advanced sterilization of food, water and products using pulsed power, pulsed power applications and research (MU Gigawatt Rep-rate Test Stand. Lasers, high voltage switching and power conditioning, high voltage pulse technology and plasmas with the 2.5 MV, 250 kA MU-Terawatt Test Stand), interesting plasma science applications, like high voltage accelerators to propel micro spacecraft, electromagnetic launchers, radio-frequency effects on electronics, power electronics, microwave photonics, electrooptics and photoconductive switches.

**Intelligent Systems.** Basic and applied research in computational intelligence (neural networks, fuzzy systems, evolutionary computation, swarm intelligence), spatial reasoning for scene understanding and human/robot interaction, pattern recognition and automated decision making, eldercare technology, computer vision and image processing, human activity analysis, cognitive robotics, landmine and explosive detection.

**Systems Modeling and Control.** Control systems, computer process control, digital and sampled data control, robotics, system biology; biologically realistic modeling, computational, neuroscience, theoretical neuroscience, electrophysiology.

**Nano and Micro Electronics.** Nano/microelectromechanical systems (N/ MEMS), micro sensors and actuators, High K dielectrics, nano structures, complex heterostructures (i.e. HEMTs, VCSELs, detectors, HBTs, etc), BioMEMS and biomedical microsystems.

**Digital System and Circuit Design, Computer Process Control.** Excellent computer equipment and other laboratory facilities are used for research sponsored by various government and industry sources. The ECE department is the home department of the following University centers: Center for Geospatial Intelligence, Center for Micro/Nano Systems and Nanotechnology, Center for Eldercare and Rehabilitation Technology, Center for Physical Electronics and Power Electronics, Center for Electromechanics and Energy Conversion, Interdisciplinary Center for Research in Earth Science Technologies, Institute for Computational Neurobiology.

## Internal Funding

### Teaching Assistantships

Teaching assistantships are normally awarded to qualified graduate students with appropriate communication skills who assist faculty members in various phases of instruction. International students may not be appointed to teaching assistantships in their first semester on campus. International students must pass a language screening test at a proper level to be eligible for the TA positions available.

### Research Assistantships

Research assistantships are granted to students qualified for working with professors on particular research projects. The research assistants are selected by faculty members who have research funds to support graduate students. Therefore, students should contact the faculty members directly for the RA possibility.

### Fellowships

The department faculty actively pursue funding for selected research fellowships. Available fellowship opportunities can be found by contacting the ECE Graduate Office. Additionally, a limited number of "Teaching Fellows" are awarded annually to outstanding PhD students, particularly for those preparing for academic careers. Details can be obtained from the ECE Graduate Office.

## Graduate

## PhD in Electrical and Computer Engineering

### Admission Contact Information

349 Engineering Building West  
Columbia, MO 65211  
573-882-4436  
Email: [umcengregradoff@missouri.edu](mailto:umcengregradoff@missouri.edu)

The ECE department offers the Doctor of Philosophy in Electrical and Computer Engineering.

### Admission Criteria for the PhD Electrical or Computer Engineering

Deadline for Fall entrance: February 15  
Deadline for Spring entrance: September 1

- Minimum GPA: 3.5 (with A = 4.0) in the last 60 hours of the MS graded coursework
- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	90th percentile	will be considered	will be considered
On or After August 1, 2011	90th percentile	will be considered	will be considered

International applicants only:

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum Academic IELTS scores:

Item	Score
Listening	5.5
Reading	5.5
Writing	5.5
Speaking	5.5

- Holds the equivalent of a BS degree in electrical or computer engineering with an outstanding record, or holds the equivalent of an MS degree in electrical or computer engineering

Consideration in doctoral program admissions is given to the applicant's grade trends, experience and maturity, and to the availability of expertise in areas of the applicant's technical interest.

### Required Application Materials

- Statement of Purpose (upload to the Supplemental information section of the application)
- Copies of your official transcripts (upload to the Educational History section of the application)
- Copies of your GRE scores (upload to the Test Information section of the application)
- Copies of your TOEFL or IELTS Scores (for non-native English speakers only) (upload to the Test Information section of the application)
- 3 letters of Recommendation (the department accepts electronic recommendations – in the recommendation section of the online application, enter the information for three recommenders. Each recommender will receive an email with instructions on how to complete the recommendation). The department does also accept hard copy letters of recommendation. The letters may be mailed to: Graduate School, 210 Jesse Hall, Columbia, MO 65211.

To the Graduate School:

Official Transcripts. The mailing address is: Graduate School, 210 Jesse Hall, Columbia, MO 65211.

Note: when registering for GRE or TOEFL exams, be sure to designate your program of interest at the University of Missouri-Columbia. MU's Institutional Code is 6875 (no departmental code is necessary).

To be accepted outright by the director of graduate studies (DGS), the student needs to have an MS degree in either Electrical Engineering or Computer Engineering.

Students who meet the academic requirements but have degrees in other engineering or science disciplines can be accepted into the PhD program by the Graduate Program Committee (GPC).

Students who don't meet the above requirements may still be admitted by the GPC if there are mitigating factors. Consideration in doctoral program admissions is given to the applicant's grade trends, experience and maturity, and to the availability of expertise in areas of the applicant's technical interest.

Outstanding BS students who meet the following requirements may be accepted directly for advisement in the department's doctoral program:

- Holds the equivalent of a BS degree in electrical or computer engineering



- GRE quantitative score of at least the 90th percentile
- TOEFL score of at least 550 paper-based. IELTS score: 5.5
- A 3.5 or better grad point average (A=4.0) in their undergraduate studies
- Submission of three letters of recommendation from persons familiar with the applicant's engineering or related work
- Submission of a statement of research interests

Additional information can be obtained from the Graduate Division of the Department of Electrical and Computer Engineering, 349 Engineering Building West, Columbia, MO 65211, or via email: [umcengrecegradoff@missouri.edu](mailto:umcengrecegradoff@missouri.edu)

## Appeal Process

All students have the right to a timely formal appeal to the GPC. Upon receipt of an admission decision or disciplinary action, the student has 10 working days in which to request a formal appeal. The DGS will convene a meeting of the GPC, the student, and the student's advocate (if appropriate) within 10 working days of receiving the request. The decision of the GPC at the hearing is final.

## Transfer of Credit

The doctoral committee may recommend up to 30 hours of post-baccalaureate graduate credit from an accredited university be transferred toward the total hours required for the doctoral degree. It is the responsibility of the doctoral committee to determine the appropriateness of coursework for transfer credit. All requests for exceptions to this policy must be approved by the Dean of the Graduate School. This policy applies to students who begin their enrollment during the Fall Term 2006 and subsequent semesters.

(Note: The preceding represents a change in policy and becomes effective for graduate students beginning their doctoral programs during the Fall semester 2006. For students who began their doctoral programs prior to the fall 2006 semester, consult the appropriate catalog or the Graduate School for policies pertaining to transfer of credit.)

The committee may recommend that courses taken through MU's Extension division be counted toward the credit hour requirement. Extension or correspondence course work from institutions other than MU may not be used to meet the total hours required for the doctoral degree.

## Time Limits on Transfer Credits

All courses to be applied to the plan of study must be completed within 8 years of filing the plan.

## Requirements to obtain the PhD degree in Electrical Engineering and Computer Engineering

1. The student must be qualified to be a PhD candidate.  
Students admitted with an MS degree must prove competency in a written qualifying examination conducted by a PhD qualifying committee within 3 semesters of admission.  
  
Students admitted directly from a BS degree program must complete the 24 hours of graded coursework requirements of the MS degree during the first two years of their program. This will prepare them for the PhD qualifying examination process, to be passed within 4 semesters after this requirement is satisfied, and will allow them to obtain an MS degree if a thesis or project report

is completed and defended, consistent with MS requirements, or to obtain an ME degree once the course work requirement has been satisfied. A student may petition the faculty for an extension of the two year requirement.

2. A minimum of 72 semester hours beyond the BS are required by the Graduate School; the student's doctoral program committee sets the total number of credit hours and specific courses to be completed as part of his/her PhD program. However, the Graduate School requires a minimum of 15 hours of 8000/9000 level classes to be taken at MU exclusive of research, problems, and supervised study.
3. The candidate must pass a written and oral comprehensive examination.
4. The student must complete a doctoral dissertation on a topic approved by his or her Doctoral Advisory Committee and defend the dissertation in an oral final examination.

These PhD requirements apply to ECE graduate students first enrolled in MU ECE in the Fall semester 2007 or later. UM ECE graduate students enrolled prior to Fall semester 2007 may choose to follow the MU ECE PhD requirements that were in effect for their MU ECE graduate admission semester.

## Selection of an Adviser

The student selects an adviser or co-advisers, by mutual consent, from doctoral faculty members who are dissertation supervisors in the department or area program in which the major work is planned. In the event that an adviser retires or leaves MU, he/she may continue to serve as a student's adviser unless there is written academic program policy prohibiting such an arrangement. If an adviser is unable or unwilling to continue to serve, the academic program, with the leadership of the director of graduate studies, will assist to ensure that a replacement is found.

## Doctoral Degree Forms

By the end of the second semester of study at MU, a student should begin submitting degree program forms which will aid the academic program and the Graduate School in tracking the student's progress toward degree completion. These forms include the following:

- D1 Qualifying Exam Results & Doctoral Committee Approval (<http://gradschool.missouri.edu/forms-downloads/repository/d1.pdf>)  
Submitted after passing qualifying exams
- D2 Plan of Study Form (<http://gradschool.missouri.edu/forms-downloads/repository/d2.pdf>)  
Submitted no later than the end of the student's third semester.
- D3 Result of the Comprehensive Examination (<http://gradschool.missouri.edu/forms-downloads/repository/d3.pdf>)  
Submitted to the Graduate School within one month of exam completion
- D4 Report of the Doctoral Dissertation Defense (<http://gradschool.missouri.edu/forms-downloads/repository/d4.pdf>)  
Submitted by the Graduate School deadline for the semester in which the students plan to graduate.
- Change of Committee (<http://gradschool.missouri.edu/forms-downloads/repository/cocform.pdf>)
- Plan of Study Course Substitution Form (<http://gradschool.missouri.edu/forms-downloads/repository/subform.pdf>)

More information is available at: <http://gradschool.missouri.edu/academics/graduation-requirements/doctoral-grad-requirements.php>

## Qualifying Examination/Process

To be officially admitted to the PhD program, the student must pass a qualifying examination/process. The student is given two opportunities to pass the Qualifying Examination with a score of 70% or above.

## Qualifying Exam Rules

1. To be eligible to take the Qualifying Examination, graduate students must be accepted for advisement in the Ph.D. program. The examination must be passed before the end of his or her second year of advisement as a Ph.D. student. Each student may take the exam twice. Students who have been accepted into the PhD program with a BS degree must complete the 24 hours of graded coursework requirements of the MS degree during the first two years of their program. This will prepare them for the PhD qualifying examination process, to be passed within two years after the requirement is satisfied, and will allow them to obtain an MS degree if a thesis or project report is completed and defended, consistent with the MS requirements, or to obtain an ME degree once the course work requirement has been satisfied. A student may petition the faculty for an extension of the two year requirement.
  2. All eligible students who intend to take the exam must complete the REQUEST FOR QUALIFYING EXAMINATION form and submit it to the ECE Graduate Office within four weeks after the start of the semester. At this time the student will be asked to select two of the seven topic areas over which he or she wishes to be examined. Only students on the approved lists will be allowed to take the exam. When a student submits the REQUEST FOR QUALIFYING EXAMINATION form, the Graduate Office will provide:
    - A. The date, time and place of the examination;
    - B. A reminder to bring their ID card to the exam.
    - C. A copy of the Qualifying Examination Rules.
    - D. A copy of the Guidelines For Qualifying Exam Committee.
  3. The examination shall be prepared and administered during the 12th week of both the fall and winter semesters by the Qualifying Examination (QE) Committee. The ECE Graduate Committee currently serves as the QE Committee since it contains a representative from each of the 6 focus areas in the department. The Graduate Director will select the specific date, time and place of the exam at the beginning of each semester.
  4. It shall be a written examination taken by all students desiring to qualify during the given semester.
  5. The exam will contain five questions from each of the two areas selected by the student. Each student must select and answer five questions from this set, with no more than three questions from one area. The exam will be closed book, with two standard pages of notes, front and back, allowed. A book of mathematical tables will be provided by the department. The exam will last four hours.
  6. The QE committee shall administer the examination and identify passing candidates. The ECE faculty as a whole have the responsibility to approve that action.
1. The QE Committee shall consist of one faculty representative from each of the following topic areas, except Foundations:
    - A. Communications and Signal Processing Area;
    - B. Intelligent Systems Area;
    - C. Physical and Power Electronics Area;
    - D. System Modeling and Control;
    - E. Micro/Nano Electronics;
    - F. Digital/Computer Systems; and
    - G. Applied Physics
    - H. Foundations
  2. The ECE graduate Committee serves as the QE Committee since it contains a representative from each research area. The ECE department chair appoints the Graduate Committee with input from the Graduate Director.
  3. The faculty from each topic area will be responsible for maintaining a list of topics which constitute the core material an MS graduate should be expected to have mastered. The members of each group will be responsible for preparing questions for the exam covering topics from the list. For the major core focus area, questions will come from 4000/7000 – 8000 level courses. Questions for the topics in the Foundation area will be from a set of required 3000 level courses.
  4. The QE Committee will solicit questions from the faculty group, but the Committee will have the responsibility of combining these questions into a fair, comprehensive exam. The QE Committee member for each group will be responsible for coordinating his or her group. The representatives of each topic group shall call a meeting of all faculty from that group for the purpose of reviewing the exam questions to be submitted to the Qualifying Exam Committee. The group's submission must be approved by a majority vote of those present.
  5. Solutions will be graded by faculty members who prepared the questions. The grading must be completed within two weeks after the exam. A guideline is that each question should be doable by a strong MS graduate in 40 to 45 minutes.
  6. Solutions will be graded on a 100 point scale with 70 points as a minimum passing grade.
  7. Each student's performance will be reviewed by the QE Committee and a majority vote of the QE Committee is required for passing.
  8. The QE Committee must report the results of the exam to the ECE Faculty within four weeks of the exam.

## Qualifying Examination Guidelines

These guidelines have been prepared to help maintain consistency in the form and difficulty of the Department's qualifying examination.

## Electrical Engineering

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S. Kovaleski, Interim Chair  
College of Engineering  
349 Engineering Building West  
(573) 882-6387  
kovaleskis@missouri.edu

The Department of Electrical & Computer Engineering is one of 9 academic departments within the College of Engineering at the University of Missouri.

Established in 1884 as the first electrical engineering program in the nation, this ABET accredited program is now home to more than 300 undergraduate students, almost 150 graduate students and 21 faculty members.

### Faculty

**Professor** R. D. Curry\*\*, C. H. Davis\*, J. M. Gahl\*\*, S. Gangopadhyay\*\*, D. K. C. Ho\*\*, N. E. Islam\*\*, J. M. Keller\*, N. D. Manring\*, S. Nair\*\*, R. M. O'Connell\*\*, M. Skubic\*\*, J. E. Thompson\*, H. W. Tyrer Jr. \*\*

**Associate Professor** M. Almasri\*\*, G. DeSouza\*\*, T. G. Engel\*, Z. He\*\*, S. D. Kovaleski\*\*, J. W. Kwon\*\*, J. J. Legarsky\*\*, G. Triplett\*\*

**Assistant Professor** M. Becchi\*\*, T. Han\*\*, C. Xiao\*, A. Zare\*\*

**Professor Emeritus** L. A. Akers\*, M. J. Devaney\*\*, R. W. McLaren\*, B. W. Sherman, K. Unklesbay

**Associate Professor Emeritus** R. W. Leavene Jr.\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

Advising and Scholarship Contact  
Tami Beatty  
Undergraduate Program Office  
349C Engineering Building-West  
(573) 882-2648  
beattyt@missouri.edu

- Department Level Requirements (p. 438)
- BSEE in Electrical Engineering (p. 438)

The Department of Electrical and Computer Engineering offers both the Bachelor of Science with a major in Electrical Engineering and the Bachelor of Science with a major in Computer Engineering. The undergraduate program in both degrees at the University of Missouri provides students with the requisite fundamentals in either discipline and prepares them for beginning practice in both the traditional and emerging fields of these disciplines. The degree programs are flexible 126-credit structures that provide the fundamentals of engineering, in addition to a thorough coverage of the major specialties within their respective fields. In addition, technical electives allow concentration in selected areas.

The ECE department emphasizes close interaction with industry. Industry engineers visit regularly and industry-sponsored student projects are provided to give extra dimension to the program.

Many students in the ECE department combine the electrical engineering major with the computer engineering major in a special 138-credit program. These students receive both the BS EE and BS COE degrees.

Students interested in interdisciplinary studies may use some electives to study business, premedicine, prelaw, and other areas. Students are able to choose from a wide variety of courses offered by other departments in the College of Engineering, as well as from other MU colleges, taking advantage of the multidisciplinary nature of the campus.

Commencing in the Fall Semester 2011, the Program Educational Objectives (PEOs) of the undergraduate program in Electrical Engineering at MU are to nurture graduates who:

- Communicate effectively, both in written reports and oral presentations.
- Analyze and design electrical systems effectively.
- Possess comprehensive problem-solving skills, including the ability to define problems and to evaluate alternative solutions.
- Work effectively in teams consisting of diverse cultures and disciplines.
- Are passionate about engineering, as demonstrated by their leadership, innovation, motivation, and interest in continuing education.

Commencing in the Fall 2011, the Program Educational Objectives (PEOs) of the undergraduate program in computer Engineering at MU are to nurture graduates who:

- Communicate effectively, both in written reports and oral presentations.
- Analyze and design electrical systems effectively.
- Possess comprehensive problem-solving skills, including the ability to define problems and to evaluate alternative solutions.
- Work effectively in teams consisting of diverse cultures and disciplines.
- Are passionate about engineering, as demonstrated by their leadership, innovation, motivation, and interest in continuing education.

### ECE Honors Program

The ECE Honors Program follows the general rules and philosophy of the College of Engineering Honors Program. Students may enter the program from the beginning of the junior year and must have a GPA of 3.0/4.0 at the start. Eligible students participate in the program by enrolling in ECE 4995 Undergraduate Honors Research in Electrical Computer Engineering for one to three credit hours, which replaces an equivalent number of hours of ECE technical electives.

The heart of the program is a research or advanced design project culminating in an undergraduate honors thesis. The project is conducted under the supervision of the honors advisor, who is an ECE faculty member selected by mutual agreement between the student and the professor. Satisfactory completion of the project requires approval (signatures) of the honors thesis by both the honors advisor and an additional faculty member, who serves as second reader of the thesis. Students who complete the program and graduate with a GPA of a least 3.0 receive the designation "Honors Scholar in Engineering" at graduation and on their diploma.

Another valuable feature of the Honors Program is that participants may reduce the number of credit hours required for degree completion to the University minimum of 120 by substituting up to six hours of credit from graduate courses through dual (undergraduate/graduate) enrollment during the last four semesters of the undergraduate program and after completion of the honors project.

## Double Majors - Electrical Engineering and Computer Engineering

Many students in the ECE department combine the BS in Electrical Engineering with the BS in Computer Engineering in a special 138-credit program. These students receive both the BS EE and BS CoE degrees.

### Major Program Requirements

#### Constitutional Elective

Select one of the following:	3
HIST 1100 Survey of American History to 1865	
HIST 1200 Survey of American History Since 1865	
HIST 1400 American History	
HIST 2210 Twentieth Century America	
HIST 2440 History of Missouri	
HIST 4000 Age of Jefferson	
HIST 4220 U.S. Society Between the Wars 1918-1945	
HIST 4230 Our Times: United States Since 1945	
POL_SC 1100 American Government	
POL_SC 2100 State Government	

Humanities/Fine Arts courses	9
Social Science/Behavioral Science courses	3

Select two of the following:	6
ENGINR 1200 Statics and Elementary Strength of Materials	
ENGINR 2300 Engineering Thermodynamics	
IMSE 2710 Engineering Economic Analysis	

#### Other major core requirement courses:

MATH 1500 Analytic Geometry and Calculus I	5
MATH 1700 Calculus II	5
MATH 2300 Calculus III	3
MATH 2320 Discrete Mathematical Structures	3
MATH 4100 Differential Equations	3
STAT 4710 Introduction to Mathematical Statistics	3
PHYSICS 2750 University Physics I	5
PHYSICS 2760 University Physics II	5
CHEM 1320 College Chemistry I	4
ENGLISH 1000 Exposition and Argumentation	3
ECONOM 1014 Principles of Microeconomics	3
or ECONOM 1015 Principles of Macroeconomics	
or ECONOM 1024 Fundamentals of Microeconomics	
CMP_SC 1050 Algorithm Design and Programming I	3
CMP_SC 2050 Algorithm Design and Programming II	3
ECE 1000 Introduction to Electrical and Computer Engineering	2
ECE 1210 Introduction to Logic Systems	3

ECE 2100 Circuit Theory I	4
ECE 3210 Microprocessor Engineering	4
ECE 3810 Circuit Theory II	4
ECE 3220 Computing for Embedded Systems	3
ECE 3830 Signals and Linear Systems	3
ECE 3510 Electromagnetic Fields	3
ECE 3410 Electronic Circuits and Signals I	4
ECE 3610 Semiconductors and Devices	3
ECE 3110 Electrical and Computer Engineering Projects	3
ECE 4220 Real Time Embedded Computing	3
ECE 4250 VHDL and Programmable Logic Devices	4
ECE 4270 Computer Organization	4
ECE 4970 Senior Capstone Design	3

#### Electives

3000+ ECE or CMP_SC Elective	12
ECE 4000+ Technical Elective	6
ECE 4000-level Senior Lecture/Lab	4
Any Elective	1

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	CMP_SC 1050	3
CHEM 1320	4	ECE 1210	3
ECE 1000	2	ENGLISH 1000	3
Constitution Requirement	3	MATH 1700	5
Economics Elective	3	Humanities/Fine Arts Elective	3
	17		17
Second Year			
Fall	Credits	Spring	Credits
ECE 2100	4	CMP_SC 2050	3
ECE 3210	4	ECE 3810	4
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	PHYSICS 2760	5
	16		15
Third Year			
Fall	Credits	Spring	Credits
ECE 3410	4	ECE 3610	3
ECE 3220	3	ECE 4250	4
ECE 3510	3	MATH 2320	3
ECE 3830	3	ECE 4000-level Technical Elective	3
ECE 4710	3	Flexible Technical Elective	3
	16		16
Fourth Year			
Fall	Credits	Spring	Credits
ECE 4220	3	ECE 3110	3
ECE 4270	4	ENGINR 1200, 2300, or IMSE 2710	3

ENGINR 1200, 2300, or IMSE 2710	3	ECE 4000+ Technical Elective	3
Flexible Technical Elective	3	Flexible Technical Elective	3
Social/Behavioral Science Elective	3	Humanities/Fine Arts Elective	3
	<b>16</b>		<b>15</b>
<b>Fifth Year</b>			
<b>Fall</b>	<b>Credits</b>		
ECE 4970 (WI)	3		
ECE 4000-level Sr Lec/Lab	4		
Flexible Technical Elective	3		
Humanities/Fine Arts Elective	3		
	<b>13</b>		
Total Credits: 141			

## Graduate

349 Engineering Building West  
Columbia, MO 65211  
Phone: 573-882-4436  
Email: [umcengregegradoff@missouri.edu](mailto:umcengregegradoff@missouri.edu)  
<http://engineering.missouri.edu/ece/>

- MS in Electrical Engineering (p. 439)

The Department also offers a PhD in Electrical and Computer Engineering (p. 432), and the College of Engineering offers an interdepartmental ME in Engineering with a focus in Computer or Electrical Engineering (p. 442).

Established in 1885, the Department of Electrical & Computer Engineering has a long tradition of excellence. Our classes are small with extensive design and laboratory experimentation. Research opportunities exist for both undergraduate and graduate students in Communication and Signal Processing, Physical Electronics, Intelligent Systems, Systems Modeling and Control, Nano and Micro Electronics, and Digital / Computer Systems.

## Career Opportunities

Throughout the 20th century, the electrical engineering and computer engineering professions devised many of the innovations that dominated the technology landscape. In the 21st century, electrical and computer engineers will be at the forefront of a wide spectrum of technologies including nanotechnology, biotechnology, sensors, power generation, electric vehicles, and telecommunications.

## Degrees Offered

At the University of Missouri, the Department of Electrical and Computer Engineering offers accredited programs of study leading to Bachelor of Science (BS), Master of Science (MS), and Doctoral (PhD) degrees.

## Areas of study include

Communications and Signal Processing. Satellite remote sensing, geospatial intelligence, image/video processing, land-mine detection, speech signal processing, wireless communications, underwater communications.

Physical Electronics. Medical applications and advanced sterilization of food, water and products using pulsed power, pulsed power applications and research (MU Gigawatt Rep-rate Test Stand. Lasers, high voltage switching and power conditioning, high voltage pulse technology and

plasmas with the 2.5 MV, 250 kA MU-Terawatt Test Stand), interesting plasma science applications, like high voltage accelerators to propel micro spacecraft, electromagnetic launchers, radio-frequency effects on electronics, power electronics, microwave photonics, electrooptics and photoconductive switches.

Intelligent Systems. Basic and applied research in computational intelligence (neural networks, fuzzy systems, evolutionary computation, swarm intelligence), spatial reasoning for scene understanding and human/robot interaction, pattern recognition and automated decision making, eldercare technology, computer vision and image processing, human activity analysis, cognitive robotics, landmine and explosive detection.

Systems Modeling and Control. Control systems, computer process control, digital and sampled data control, robotics, system biology; biologically realistic modeling, computational, neuroscience, theoretical neuroscience, electrophysiology.

Nano and Micro Electronics. Nano/microelectromechanical systems (N/ MEMS), micro sensors and actuators, High K dielectrics, nano structures, complex heterostructures (i.e. HEMTs, VCSELs, detectors, HBTs, etc), BioMEMS and biomedical microsystems.

Digital System and Circuit Design, Computer Process Control. Excellent computer equipment and other laboratory facilities are used for research sponsored by various government and industry sources. The ECE department is the home department of the following University centers: Center for Geospatial Intelligence, Center for Micro/Nano Systems and Nanotechnology, Center for Eldercare and Rehabilitation Technology, Center for Physical Electronics and Power Electronics, Center for Electromechanics and Energy Conversion, Interdisciplinary Center for Research in Earth Science Technologies, Institute for Computational Neurobiology.

## Internal Funding

### Teaching Assistantships

Teaching assistantships are normally awarded to qualified graduate students with appropriate communication skills who assist faculty members in various phases of instruction. International students may not be appointed to teaching assistantships in their first semester on campus. International students must pass a language screening test at a proper level to be eligible for the TA positions available.

### Research Assistantships

Research assistantships are granted to students qualified for working with professors on particular research projects. The research assistants are selected by faculty members who have research funds to support graduate students. Therefore, students should contact the faculty members directly for the RA possibility.

### Fellowships

The department faculty actively pursue funding for selected research fellowships. Available fellowship opportunities can be found by contacting the ECE Graduate Office. Additionally, a limited number of "Teaching Fellows" are awarded annually to outstanding PhD students, particularly for those preparing for academic careers. Details can be obtained from the ECE Graduate Office.

## Undergraduate

## Department Level Requirements - Electrical Engineering

Both the Bachelor of Science in Electrical Engineering (BS EE) and the Bachelor of Science in Computer Engineering (BS COE) require that students earn a 2.0 GPA or better in all courses that have an MU engineering prefix. All ECE courses require a grade of C or better in ECE prerequisites.

Engineering design in both the electrical engineering and computer engineering programs is provided through an integrated laboratory structure. Beginning with the first laboratory course in the fourth semester of each program, students have a significant design and laboratory experience in each semester of their respective programs.

In addition to the major core requirements, students must complete all University graduation requirements including University general education, as well as all degree and college or school requirements.

## BSEE in Electrical Engineering

### Major Program Requirements

The electrical engineering degree offers course work in all traditional areas of the electrical engineering field. Focused areas of work are offered in the areas of communications, digital systems, discrete and integrated electronics, electromagnetics, energy systems and power electronics, robotics and system control. (Focus areas are not listed on transcripts or diplomas).

Students must complete all university requirements (p. 17), including general education (p. 18), and Department Level Requirement (p. 438), in addition to the degree requirements below.

#### Major core requirements

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4100	Differential Equations	3
STAT 4710	Introduction to Mathematical Statistics	3
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
CHEM 1320	College Chemistry I	4
ENGLISH 1000	Exposition and Argumentation	3
Select two of the following:		6

ENGINR 1200 Statics and Elementary Strength of Materials

ENGINR 2300 Engineering Thermodynamics

IMSE 2710 Engineering Economic Analysis

#### Economics Elective

Select one of the following: 3

ECONOM 1014 Principles of Microeconomics

ECONOM 1015 Principles of Macroeconomics

ECONOM 1024 Fundamentals of Microeconomics

#### Constitutional Elective

Select one of the following: 3

HIST 1100 Survey of American History to 1865

HIST 1200 Survey of American History Since 1865

HIST 1400 American History

HIST 2210 Twentieth Century America

HIST 2440 History of Missouri

HIST 4000 Age of Jefferson

HIST 4220 U.S. Society Between the Wars 1918-1945

HIST 4230 Our Times: United States Since 1945

POL\_SC 1100 American Government

POL\_SC 2100 State Government

Humanities/Fine Arts courses 9

Social Science/Behavioral Science courses 3

#### Other major core requirement courses:

CMP\_SC 1050 Algorithm Design and Programming I 3

ECE 1000 Introduction to Electrical and Computer Engineering 2

ECE 1210 Introduction to Logic Systems 3

ECE 2100 Circuit Theory I 4

ECE 3210 Microprocessor Engineering 4

ECE 3810 Circuit Theory II 4

ECE 3830 Signals and Linear Systems 3

ECE 3510 Electromagnetic Fields 3

ECE 3410 Electronic Circuits and Signals I 4

ECE 3610 Semiconductors and Devices 3

ECE 3110 Electrical and Computer Engineering Projects 3

ECE 4970 Senior Capstone Design 3

#### Electives

ECE or CMP\_SC 3000+ Elective 12

ECE 4000+ Technical Elective 9

ECE 4000+ Senior Lecture/Lab 4

Any Elective 4

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CHEM 1320	4	ECE 1210	3
MATH 1500	5	CMP_SC 1050	3
ECE 1000	2	ENGLISH 1000	3
Constitutional Elective	3	MATH 1700	5
Economics Elective	3	Humanities/Fine Arts Elective	3
	17		17
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	PHYSICS 2760	5
ECE 3210	4	ECE 3810	4

ECE 2100	4	Humanities/Fine Arts Elective	3
	<b>16</b>		<b>15</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ECE 3410	4	ECE 3610	3
ECE 3510	3	ENGINR 1200, 2300, or IMSE 2710	3
ECE 3830	3	Flexible Technical Elective	3
STAT 4710	3	Flexible Technical Elective	3
Social/Behavioral Science Elective	3	Humanities/Fine Arts Elective	3
	<b>16</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ECE 3110	3	ECE 4970 (WI)	3
Flexible Technical Elective	3	ENGINR 1200, 2300, or IMSE 2710	3
ECE 4000+ Technical Elective	3	Flexible Technical Elective	3
ECE 4000+ Technical Elective	3	ECE 4000+ Senior Lecture/Lab	4
Free Elective	2	ECE 4000+ Technical Elective	3
	<b>14</b>		<b>16</b>
Total Credits: 126			

## Graduate

### MS in Electrical Engineering

#### Master of Science in Electrical or Computer Engineering (MS)

##### Admission

349 Engineering Building West, Columbia, MO 65211  
 Phone: 573-882-4436  
 Email: [umcengregegradoff@missouri.edu](mailto:umcengregegradoff@missouri.edu)  
<http://engineering.missouri.edu/ece/>

##### Admission Criteria

Fall deadline: February 15  
 Spring deadline: September 1  
 Note: Applications received after these deadlines will be evaluated as time allows.

- Minimum GPA: 3.0 for the last 60 hours
- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	80th percentile	will be considered	will be considered
On or After August 1, 2011	80th percentile	will be considered	will be considered

International applicants only:

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum Academic IELTS scores:

Item	Score
Listening	5.5
Reading	5.5
Writing	5.5
Speaking	5.5

Required Application Materials:

- Statement of Purpose (upload to the Supplemental information section of the application)
- Copies of your official transcripts (upload to the Educational History section of the application)
- Copies of your GRE scores (upload to the Test Information section of the application)
- Copies of your TOEFL or IELTS Scores (for non-native English speakers only) (upload to the Test Information section of the application)
- 3 letters of Recommendation (the department accepts electronic recommendations – in the recommendation section of the online application, enter the information for three recommenders. Each recommender will receive an email with instructions on how to complete the recommendation). The department does also accept hard copy letters of recommendation. The letters may be mailed to: Graduate School, 210 Jesse Hall, Columbia, MO 65211.

To the Graduate School:

Official Transcripts. The mailing address is: Graduate School, 210 Jesse Hall, Columbia, MO 65211.

Note: when registering for GRE or TOEFL exams, be sure to designate your program of interest at the University of Missouri – Columbia. MU's Institutional Code is 6875 (no departmental code is necessary).

#### Admissions Criteria for the MS in Electrical or Computer Engineering

To be accepted outright by the director of graduate studies (DGS), the student needs to have a BS degree in either Electrical Engineering or Computer Engineering in addition to meeting the above requirements. Students who meet the academic requirements but have degrees in other engineering or science disciplines can be accepted directly into the MS program by the graduate program committee (GPC). Such students are strongly encouraged to consult with the DGS or their advisor about appropriate bridge courses. Based on individual circumstances, students may be advised to register as an undeclared graduate student to fill in background course work prior to admission into the department.

Students who do not meet the above requirements may still be admitted on probation by the GPC if there are mitigating factors. Students admitted on probation must receive at least a 3.0 GPA for the first 12 hours of graded graduate coursework completed in their first two semesters. Failure to achieve this GPA will result in expulsion from the ECE MS program.

#### Appeal Process

All students have the right to a timely formal appeal to the GPC. Upon receipt of an admission decision or disciplinary action, the student has 10 working days in which to request a formal appeal. The DGS will convene a meeting of the GPC, the student, and the student's advocate

(if appropriate) within 10 working days of receiving the request. The decision of the GPC at the hearing is final.

## Degree Requirements

To fulfill the requirements for the MS degree, the following rules apply:

- A candidate must complete 30 hours, including at least 12 hours of 8000-level graded course work (exclusive of ECE 8990 or ECE 8085 or ECE 8010 hours).
- At least six of these graded 8000 level course hours need to come from ECE.
- At least 15 hours of graded course work (total combination of 7000 and 8000 level courses, exclusive of ECE 8990, ECE 8085, or ECE 8010 hours) must be taken from the Electrical and Computer Engineering Department course offerings.
- A maximum of six hours of graduate credit may be transferred from another campus in the University of Missouri System or other university, while a maximum of eight hours of graduate credit may be used from a previous MU master's degree.
- At most, three hours of course work in supervised study (ECE 8010) may be taken during the MS program and they will be graded on an S/U basis.
- At least one course from each of three different emphasis areas must be taken; a minimum of two of the emphasis areas must be in Electrical and Computer Engineering. (Each ECE graduate course is designated to an emphasis area. Contact the ECE graduate office for a current list).
- A minimum of 3 hours to a maximum of 6 hours of research (ECE 8990) or problems (ECE 8085) are required, based on whether the student writes a master's thesis or a master's Report.
- The student's cumulative GPA must be at least 3.0 to graduate.

The requirements for the MS degree must be met within an eight year period. Each candidate must pass a final oral examination to demonstrate mastery of the work included in the thesis or in a substantial independent project. These MS requirements apply to ECE graduate students first enrolled in MU ECE in the Fall semester 2007 or later. UM ECE graduate students enrolled prior to Fall semester 2007 may choose to follow the MU ECE MS requirements that were in effect for their MU ECE graduate admission semester.

## Academic Probation

A student whose GPA drops below 3.0 is automatically placed on academic probation. In such a case, the student has one semester to raise his or her cumulative GPA to 3.0. Failure to do so will result in expulsion from the program. Additionally, a student who receives the grade of "C" in 9 hours of coursework will be expelled. As with acceptance, students here also have a right to the same formal appeal process described above.

## Selection of an Advisor

Students must choose an academic advisor who will then provide guidance for the selection of coursework, and in the choice and execution of a research question. The student's academic advisor and the Director of Graduate Studies must approve all coursework used to satisfy the credit hour requirements for this degree. After performing satisfactorily for a minimum of one semester, the student, with the adviser's assistance, completes the Program of Study form that outlines the plan of study for the student's graduate program. M1 - Program of Study form

The form is forwarded through the DGS to the Graduate School for approval. In the event that an adviser retires or leaves MU, he/she may continue to serve as the student's main adviser unless there is written academic program policy prohibiting such an arrangement. If an adviser is unable or unwilling to continue to serve, the academic program, with the leadership of the DGS, will assist the student to ensure that a replacement is found.

The Program of Study form must be filed with the Graduate School by the end of the student's second semester of enrollment. Upon approval of the program by the Graduate School, the student is a candidate for the degree. If changes must be made on a student's Program of Study form, a Program of Study Substitution form is used.

## Thesis Option

For students under the thesis option of the MS degree, i.e., students enrolling for ECE 8990, an M-2 Request for Thesis Committee form is required to be submitted for approval by the department DGS and the Graduate School by the end of the student's second semester.

A thesis committee is composed of three members of the MU faculty: a major adviser from the academic program, a second reader from the academic program, and an outside reader who is a member of the graduate faculty from a different MU graduate program. Upon approval of the department DGS, the student may petition the Graduate School to allow a person who is not a member of the MU graduate faculty to serve as the third reader. The petition should include a written justification for such a request and a copy of the person's curriculum vitae. The Graduate School maintains copies of curriculum vitae previously received and approved, and if such a request is anticipated, the student should contact the Graduate School to see if the curriculum vita of a particular person is already on file. Students need to supply committee members with copies for review/evaluation at least one week prior to the defense date.

Information about submitting the thesis can be found in the Thesis and Dissertation Guidelines.

## Non-Thesis Option

For students who enroll in ECE 8085 (Problems), a problem report rather than a thesis is required. The student is not required to submit the M-2 form (request for a thesis committee). Instead, the student must have the report approved by his or her advisor and two other members of the graduate faculty, forming the student's Problem Committee. It is not required that a member outside of ECE be included, although it is permissible for such a member of the MU graduate faculty to be appointed. At least one of the three members must have a primary academic appointment in ECE. Students need to supply committee members with copies for review /evaluation at least one week prior to the defense date. At that time, an announcement is to be made to the department faculty and graduate students to allow them to attend the defense. The student must defend the problem report to the committee, and make any needed adjustments in format and corrections/clarifications based on input from the committee. A final copy of the problem report must be filed with the ECE graduate office.

## Report of the Master's Examining Committee

The purpose of the M-3 Report of the Master's Examining Committee Form is to have an official record of the final examining process, whether it is a thesis defense or presentation of a report. The student's committee



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will indicate on this form if the student has passed the final exam. This form must be submitted to the Graduate School by a deadline for the semester in which the students plan to graduate. For a report option, the 3rd reader of the committee may be from the student's department. The form is due in the Graduate School two weeks prior to graduation.

## Engineering

Programs in Engineering are multi-department programs, and administered by the College of Engineering. Requirements are determined based on the specific area of interest. Options include a minor at the undergraduate level, and a master's degree at the graduate level.

College of Engineering  
W1025 Lafferre Hall  
Columbia, MO 65211  
<http://engineering.missouri.edu>

## Faculty

**Instructor** D. R. Huaco, R. T. Whelove

Please see the appropriate degree program pages for faculty information.

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Minor in Engineering (p. 442)

## Graduate

- ME in Engineering (p. 442)

The College of Engineering offers the Master of Engineering degree for graduate students interested in a terminal master's degree, who have a demonstrated need for a professional, non-research degree in engineering, and have an academic interest in a specific focus area within engineering.

Several departments in the College of Engineering administers an ME degree focusing in that area.

**Note:** A focus area is not listed on the MU transcript. Hence the transcript and the diploma for any student completing an ME degree will only indicate Master of Engineering, with no designation of any specific department.

## Undergraduate

### Minor in Engineering

The minor in engineering is designed for students majoring in disciplines such as physics, math, chemistry and computer science, but it is available to students in all disciplines. It consists of 18 or 19 hours of engineering courses as listed below.

#### Required Courses

ENGINR 1000	Introduction to Engineering	2
ENGINR 1100	Engineering Graphics Fundamentals	2
ENGINR 1200	Statics and Elementary Strength of Materials	3

ENGINR 2100	Circuit Theory for Engineers	3
ENGINR 2300	Engineering Thermodynamics	3
CMP_SC 1040	Introduction to Problem Solving and Programming	3
CMP_SC 1050	Algorithm Design and Programming I	3
<b>Engineering Elective - choose from the list below:</b>		3-4
BIOL_EN 2180	Engineering Analysis of Bioprocesses	3
CH_ENG 2118	Introduction to Energy Technology and Sustainability	3
CH_ENG 2225	Mass and Energy Balance	3
CV_ENG 3100	Fundamentals of Transportation Engineering	4
CV_ENG 3200	Fundamentals of Environmental Engineering	4
CV_ENG 3700	Fluid Mechanics	3
CV_ENG 4102	Infrastructure Management	3
CV_ENG 4250	Environmental Regulatory Compliance	3
CV_ENG 4500	Introduction to Construction Management	3
ENGINR 2200	Intermediate Strength of Materials	3
ECE 1210	Introduction to Logic Systems	3
IMSE 2030	Fundamentals of Systems Design and Analysis	3
IMSE 2110	Probability and Statistics for Engineers	3
IMSE 2210	Linear Algebra for Engineers	3
IMSE 2710	Engineering Economic Analysis	3
MAE 2600	Dynamics	3

## Graduate

### ME in Engineering

NOTE: Focus areas do not appear on diplomas or transcripts.

### ME with a focus in Biological Engineering

Recognizing the immense promise of bioengineering and the unique position of MU for a strong bioengineering program, the College of Agriculture, Food and Natural Resources (CAFNR) and the College of Engineering (CoE) joined forces to form the Department of Biological Engineering (BE). BE unites existing faculty and infrastructure from both colleges. CoE contributes biomedical engineering capabilities while CAFNR brings strengths in bioprocess and bioenvironmental engineering. Biological engineering confers both masters and doctoral degrees to students who satisfy the general requirements of the Graduate School and the specific requirements for the masters degree and the doctoral degree of the Department of Biological Engineering

### ME with a focus in either Electrical or Computer Engineering

The ME degree is designed for entering master students interested in a terminal master's degree, who have a demonstrated need for a professional, non research degree in engineering, and have an academic interest in the department. Please note that the official University transcript and diploma will only indicate Master of Engineering, with no designation of the focus area. The entrance requirements for the ME degree/Electrical and Computer Engineering Focus are the same as for the MS in Electrical Engineering and MS in Computer Engineering. Note: When registering for the GRE and TOEFL exams, be sure to designate the University of Missouri-Columbia and your program of interest as

locations to receive the scores. MU's Institutional Code for the GRE and TOEFL is: 6875.

## ME with a focus in Industrial and Manufacturing Systems Engineering

The Master of Engineering (ME) degree is a non-research thirty-six-credit-hour program for U.S. students designed to be a terminal degree. The ME curriculum is based upon a seven-course core with the remaining 15 hours made up of courses appropriate to the student's concentration area.

### ME Entrance requirements

- GPA of 3.0 on 4.0 scale in the last 60 hours of the BS program
- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	will be considered	80th percentile	will be considered
On or After August 1, 2011	will be considered	80th percentile	will be considered

- Minimum TOEFL scores (international applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum Academic IELTS scores

Item	Score
Listening	5.5
Reading	5.5
Writing	5.5
Speaking	5.5

- 3 letters of recommendation
- statement of purpose
- transcripts

When registering for the GRE and TOEFL exams, be sure to designate the University of Missouri - Columbia and your program of interest as locations to receive the scores. MU's institutional code for the GRE and TOEFL is 6875.

### Graduation Requirements

An ME student must complete a minimum of 36 credit hours of graduate course work. At least 15 hours must be in 8000+ level courses and a minimum of 21 hours must be from the College of Engineering. The student must maintain at least a 3.0 cumulative gpa and complete the program in eight years. A project may be required by the adviser. For additional degree requirements based on the focus area, students should consult with the specific College of Engineering Department.

### How to Apply

Applicants must concurrently apply to the MU Graduate School and the engineering department offering the focus area interest. Contact the department *before* applying for specific instructions.

## Industrial Engineering

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Luis G. Occeña, Chair  
College of Engineering  
E3437 Lafferre Hall  
(573) 882-2692  
<http://engineering.missouri.edu/imse>

Industrial and manufacturing systems engineering is a blending of natural sciences, engineering science, mathematics, computers, social science and management. This fusion of diverse skills allows industrial engineers to design and implement socio-technical systems - complex combinations of people and technology brought together to solve problems. With its diversity, industrial engineering is used in a wide variety of areas in both manufacturing and service industries.

Industrial engineers in a manufacturing organization address many issues including designing workplaces, considering not only the capabilities of machines, but also the physiological and psychological capabilities of humans. They may design computer-integrated manufacturing systems with robots and computer systems to control production or manage inventory and quality of complex products, determining plant and warehouse locations. They may also develop sales forecasts, evaluate proposals to produce new products and build new or improved production facilities.

The same skills used as an industrial engineer to design manufacturing systems are also useful in designing better systems to care for patients in hospitals, to facilitate the judicial process, to provide faster and more accurate mail distribution and to improve airline routing and reservation methods. In effect, the industrial engineer may be involved in the design of a range of systems that provide beneficial services at a cost that society can afford.

The department offers the Bachelor of Science with a major in Industrial Engineering (BSIE), and 5 year Industrial Engineering BSIE/MS and BSIE/MBA programs. The department also offers students the opportunity to obtain Lean Six Sigma Green Belt certification.

### Faculty

**Professor** W. Jang\*\*, C. M. Klein\*\*, J. S. Noble\*\*, B. Wu\*\*

**Associate Professor** C. H. A. Chang\*\*, L. G. Occeña\*\*

**Assistant Professor** J. H. Kim, R. G. McGarvey

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 446)
- BSIE in Industrial Engineering (p. 446)

#### Advising Contact

James S. Noble, Director of Undergraduate Studies

#### Scholarship Information Contact

Luis G. Occeña

Industrial engineering undergraduates complete a curriculum similar to all engineering students during the first two years. The objective of this curriculum is to give the student a rigorous foundation in mathematics, natural sciences, basic engineering sciences, applied probability and computer science, as well as a complementary and meaningful exposure to the humanities and social sciences.

In addition to the foundational courses, students gain knowledge of optimization methodologies, static and dynamic modeling. They also learn evaluation techniques for the modeling and evaluation of integrated systems of people, technology and information in the areas of strategic planning, production systems, control systems, quality systems, information systems, product and process design.

These fundamental skills provide the foundation from which students learn to develop systematic and integrated solution approaches to large-scale enterprise problems. In order to be successful as they begin their careers (or graduate study) students learn to communicate effectively in both oral and written forms, and become proficient in working in diverse teams of individuals.

Lastly, the curriculum prepares the student to practice in an ethical and professional manner, to serve as well as benefit from the engineering profession, and to continue the learning of and the contribution to the advancement of industrial and manufacturing systems engineering concepts.

Industrial engineering design experiences are integrated throughout the curriculum, many times in a team-based environment. Industrial engineering design is the process of developing and improving integrated systems that include people, materials, information, equipment and energy.

### Educational Objectives

Graduates of the Department of Industrial and Manufacturing Systems Engineering (IMSE) at the University of Missouri are able to:

- Assess and create enterprise value through innovative structured problem solving, in order to make processes faster, more innovative, reliable or cost-efficient
- Analyze and design optimized solutions to systems of people, technology and information
- Provide leadership for and communicate effectively in a team-based environment in order to be agents of change in dynamically changing organizations

### Educational Outcomes

All IMSE BSIE graduates should have:

- **Foundational knowledge** in mathematics, natural sciences, engineering sciences, applied probability, computer science, humanities and social science.
  - ABET a) knowledge of math, science, engineering
  - ABET h) understanding of global/societal context of engineering
  - ABET j) knowledge of contemporary issues
- **Optimization skill sets** for modeling, optimization and evaluation of integrated systems of people, technology and information.
  - ABET b) ability to design/conduct experiment; data analysis
  - ABET k) ability to use techniques, skill and tools
- **Problem-solving ability** based upon knowledge and skills to develop integrated solutions to large-scale, socio-technical problems
  - ABET c) ability to design integrated systems

- ABET e) ability to identify, formulate and solve IE problems
- ABET k) ability to use techniques, skill and tools
- **Communication and group dynamics skills** to communicate in both oral and written forms and to become proficient in working in diverse teams of individuals.
  - ABET d) ability to function in teams
  - ABET g) ability to communicate effectively
- Understanding of **professional and ethical behavior** to be prepared for ethical decision making, service to the engineering profession, and to have the means to continue in the acquisition of knowledge.
  - ABET f) understanding of professional/ethical responsibility
  - ABET i) recognition of need for life-long learning.

In summary, graduates of the Department of Industrial and Manufacturing Systems Engineering (IMSE) will possess a strong foundation upon which they can grow professionally, and continue to build a focused set of fundamental and engineering knowledge and skills that are integrated and applicable to real-world problems in any enterprise setting.

Because industrial engineering graduates are capable of solving complex problems requiring an understanding of an entire organization, they become prime candidates for top management or administrative positions.

## IMSE Honors Program

The IMSE Honors Program follows the regulations and philosophy of the College of Engineering Honors Program, and as such is intended to encourage, facilitate and reward independent study by high-ability undergraduate students.

The heart of the program is an undergraduate honors project, undertaken and completed by the time of graduation while enrolling in 1 to 6 credits of IMSE 4995 (p. 452) Undergraduate Honors Research Industrial Engineering. The academic credit for the honors project (1-6 credits in IMSE 4995 (p. 452) replaces an equivalent number of credits of IMSE or Technical electives. The project is conducted under the direction of an IMSE professor (honors advisor) who is selected by the student, with agreement by the professor. The project culminates in an honors thesis, which is read and approved by the honors advisor and then approved by the chair of the IMSE honors committee. A finished copy of the honors thesis, signed by the honors advisor and second reader, is required for satisfactory completion of the project.

### Academic Qualifications for the Honors Program

In the case of a transfer student, transferred credit plus MU credit must average 3.0/4.0. A student is typically eligible for the honors program at the junior year of their undergraduate program.

The successful honors scholar is given a degree of flexibility in the program of study. Additionally, honors scholars may reduce the credits required for degree completion to the University minimum (i.e., 120 credits) by substituting graduate course credits through dual enrollment (undergraduate/graduate at MU) during the last two semesters of the undergraduate program.

Honors students must maintain and graduate with a 3.0 overall GPA.

## Lean Six Sigma Green Belt Certification

IMSE students have the opportunity to obtain a Lean Six Sigma Green Belt certification either during their degree program or after. Certification requires students to obtain a GPA average of 2.5 or better in IMSE 4110, 4310, and 4610, then they must successfully complete IMSE 4385 - Lean

Six Sigma Green Belt Project (a 1 credit hour course where DMAIC is used to improve a process within an organization).

## Graduate

Industrial & Manufacturing Systems Engineering Graduate Programs  
College of Engineering  
E3437 Lafferre Hall  
573-882-2691  
<http://engineering.missouri.edu/imse/>

**Director of Graduate Studies:** Cheng-Hsiung A. Chang

- MS in Industrial Engineering (p. 447)
- PhD in Industrial Engineering (p. 448)

## About IMSE

The graduate program in industrial engineering provides a scholarly environment in which highly qualified, creative students may obtain the knowledge and develop the skills necessary to solve complex industrial, governmental and societal system design problems. These systems are required to operate within increasingly complex constraints, thus requiring the use of sophisticated and creative designs. The industrial engineer responsible for such designs must be capable of applying a broad spectrum of scientific tools if the most effective systems are to be obtained.

Our master of science program is designed to provide a basic understanding of these tools and experience in the application of these tools in the design process. The doctor of philosophy program is designed to provide the specialized knowledge and skills necessary to develop new tools or methods for solving complex systems design problems. Information on engineering licensure is detailed under Professional Engineering Registration.

## General Admission Guidelines

Acceptance for advisement in the department's graduate programs is available to students with an ABET accredited undergraduate engineering degree. Engineering graduates who have not taken linear programming, linear algebra, statistical quality control or engineering economic analysis must complete 12 hours of additional course work before graduation.

Students with baccalaureate degrees in mathematics, physics, chemistry or computer science may be accepted if they have completed 13 hours of calculus, three hours of differential equations and six hours of calculus-based probability and statistics. Several factors are considered in evaluating an applicant's capability, such as overall GPA, grade trends and major area grades. In addition, each applicant is required to take the general test of the GRE and international students must take the TOEFL and TWE, or IELTS.

## Facilities and Resources

Laboratory facilities in several major application areas, both within the department and in the college, support the academic program. Neighboring industries, city, county and state government agencies, local hospitals and nearby large metropolitan centers provide a reservoir of research and design opportunities.

## Computing and Reference Materials

The department has access to the University of Missouri System computing network and maintains its own computing facilities for student use. Besides Ellis Library facilities, an excellent collection of mathematical, statistical and engineering books and reference materials are housed in the engineering library and the industrial and manufacturing systems engineering departmental library.

## Funding

Fellowships, scholarships and teaching and research assistantships are available to qualified graduate students. These forms of financial assistance are supported by funds made available through state, federal and industrial graduate support programs and through research grants from various industrial and governmental agencies

## Undergraduate

### Department Level Requirements - Industrial Engineering

There are no Departmental Level Requirements for the Bachelor of Science in Industrial Engineering (BSIE). All requirements are specific to the degree and can be found on the BSIE page (p. 446).

### BSIE in Industrial Engineering

#### Major Program Requirements

In addition to the major core requirements, students must complete all University graduation requirements (p. 17) including University general education (p. 18), as well as all degree and college or school requirements.

#### Major Core Requirements

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4100	Differential Equations	3
CHEM 1320	College Chemistry I	4
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
CMP_SC 1040	Introduction to Problem Solving and Programming	3
or CMP_SC 1050	Algorithm Design and Programming I	
ENGINR 1100	Engineering Graphics Fundamentals	2
ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2300	Engineering Thermodynamics	3
ENGINR 2100	Circuit Theory for Engineers	3
IMSE 1000	Introduction to Industrial Engineering	1
IMSE 2030	Fundamentals of Systems Design and Analysis	3
IMSE 2110	Probability and Statistics for Engineers	3
IMSE 2210	Linear Algebra for Engineers	3
IMSE 2710	Engineering Economic Analysis	3
IMSE 3810	Ergonomics and Workstation Design	3
IMSE 4110	Engineering Statistics	3

IMSE 4210	Linear Optimization	3
IMSE 4230	Operations Research Models	3
IMSE 4280	Systems Simulation	3
IMSE 4310	Integrated Production Systems Design	3
IMSE 4350	Production and Operations Analysis	3
IMSE 4410	Management Information Systems Design	3
IMSE 4550	Computer Aided Design and Manufacturing	4
IMSE 4610	Engineering Quality Control	3
IMSE 4970	Capstone Design I	1
IMSE 4980	Capstone Design II	3
<b>IMSE electives</b>		<b>6</b>
Choose from the following:		6
IMSE 3030	Manufacturing and Supply Systems	3
IMSE 4001	Topics in Industrial and Manufacturing Systems Engineering	3
IMSE 4085	Problems in Industrial Engineering	1-3
IMSE 4330	Material Flow and Logistics System Design	3
IMSE 4420	Web-Based Information Systems	3
IMSE 4560	Introduction to Rapid Prototyping	3
IMSE 4570	Computer Integrated Manufacturing Control	3
IMSE 4750	Entrepreneurial Innovation Management: Enterprise Conception	3
IMSE 4770	Entrepreneurial Innovation Management: Enterprise Operations	3
IMSE 4990	Undergraduate Research in Industrial Engineering	1-3
IMSE 4995	Undergraduate Research Industrial Engineering - Honors	1-3

<b>Engineering elective</b>		<b>3</b>
Choose from the following:		3
BIOL_EN 2180	Engineering Analysis of Bioprocesses	3
CV_ENG 2080	Introduction to Dynamics	3
CV_ENG 3700	Fluid Mechanics	3
ENGINR 2200	Intermediate Strength of Materials	3
MAE 2600	Dynamics	3
<b>Technical electives</b>		<b>6</b>

A technical elective is defined as any course relevant to the degree program but not required, such as computer science, engineering, mathematics, science and select business courses.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
MATH 1500	5	MATH 1700	5
CHEM 1320	4	ENGINR 1100	2
IMSE 1000	1	IMSE 2030	3
Constitutional Requirement (Social Science Elective)	3	ECONOM 1014 (Required Social Science Elective)	3

Humanities / Social Science Elective	3	ENGLISH 1000	3
	<b>16</b>		<b>16</b>
<b>Second Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MATH 2300	3	MATH 4100	3
PHYSICS 2750	5	PHYSICS 2760	5
CMP_SC 1040 or 1050	3	ENGINR 1200	3
IMSE 2110	3	IMSE 2210	3
IMSE 2710	3	IMSE 4110	3
	<b>17</b>		<b>17</b>
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ENGINR 2300	3	ENGINR 2100	3
IMSE 3810	3	IMSE 4310	3
IMSE 4210	3	IMSE 4350	3
IMSE 4230	3	IMSE 4410	3
IMSE 4280	3	Humanities/Social Science Elective	3
	<b>15</b>		<b>15</b>
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
IMSE 4550	4	Engineering Elective	3
IMSE 4610	3	IMSE 4980	3
IMSE 4970	1	IMSE Elective	3
IMSE Elective	3	Technical Elective	3
Technical Elective	3	Humanities/Social Science Elective	3
Humanities/Social Science Elective	3		
	<b>17</b>		<b>15</b>
Total Credits: 128			

## Graduate

### MS in Industrial Engineering

#### Admission Contact Information

Jonni Sutton (suttonjo@missouri.edu)  
 E3437 Thomas and Nell Lafferre Hall; Columbia, MO 65211  
 573-882-2691

The Master of Science in Industrial Engineering (MS) degree consists of two options: a 30-credit hour research oriented program requiring a thesis or a 30-credit hour application oriented program requiring a project report. The MS Industrial Engineering thesis option curriculum is built upon the choice of a concentration area around which students can mold their overall academic effort including six hours of research. The three current focus areas are Operations Research and Statistics, Manufacturing/Production/Service Systems and Human and Enterprise Systems. Other focus areas are in development. The MS Industrial Engineering project option requires three hours of an approved project advised by a faculty member in lieu of a thesis, and one more course.

#### Master of Engineering

The Master of Engineering (ME) degree is a non-research thirty-six-credit-hour program for U.S. students designed to be a terminal degree.

The ME curriculum is based upon a seven-course core with the remaining 15 hours made up of courses appropriate to the student's concentration area.

#### Dual Master's Degree Programs: Master of Science and MBA

The Department of Industrial and Manufacturing Systems Engineering, in cooperation with the College of Business, offers a dual master's degree program for those students who wish to combine the specialized skills of the industrial engineer with the general knowledge of the professional manager. The program was developed in recognition of the fact that solutions to organization problems often require that the engineer's analytical abilities be applied simultaneously with the manager's integrative perspective. This dual program has been carefully structured to provide the necessary academic background to obtain an MS in industrial engineering and an MBA simultaneously, in a minimum amount of time, usually two academic years.

#### Master of Science and MHA

The Department of Industrial and Manufacturing Systems Engineering, in cooperation with the health services management program of the School of Medicine, offers a dual master's degree program to prepare its graduates for careers in the design and administration of health-care delivery systems and organizations. The program was developed in recognition of the highly complex nature of health-care organizations. The program's basic objective is to fuse competencies in health-service management and in health-systems design. The required courses in the industrial engineering program serve as the area of specialization in the health services management program, and the required courses in the health-services management program are used as electives in the industrial engineering program. As a result, it is possible for the student to earn an MHA in health-services management and an MS in industrial engineering simultaneously.

### Application Deadlines

Applications accepted all year.

Fall decision dates: March 1

Spring decision date: September 1

#### Minimum Admission Criteria

- Minimum GPA: 3.0/4.0
- Test of Written English: (TWE) of 4.0 (international applicants only)
- Minimum Academic IELTS OVERALL score: 6.0; or Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)	
80	550	
• Minimum GRE scores:		
When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	350	700
On or After August 1, 2011	143	155

- Foreign Language: No foreign language is required in either program.

### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the IMSE Graduate Program:

- 3 letters of recommendation
- Statement of Purpose
- Curriculum Vitae (CV)
- GRE scores

## TA/RA Hiring

This academic department does **not** have any function of financial Aid. Rather, IMSE hires TA/RA automatically based on the department needs. No separate application or contacts are necessary; all top ranked applicants will be considered.

## Degree Completion Requirements

The Master of Science in Industrial Engineering (MS) degree consists of two options: a 30-credit hour research oriented program requiring a thesis or a 30-credit hour application oriented program requiring a project report. The MS Industrial Engineering thesis option curriculum is built upon the choice of a concentration area around which students can mold their overall academic effort including six hours of research. The three current focus areas are Operations Research and Statistics, Manufacturing/Production/Service Systems and Human and Enterprise Systems. Other focus areas are in development. The MS Industrial Engineering project option requires three hours of an approved project advised by a faculty member in lieu of a thesis, and one more course.

## PhD in Industrial Engineering

### Admission Contact Information

Jonni Sutton (suttonjo@missouri.edu)  
 E3437 Thomas and Nell Lafferre Hall; Columbia, MO 65211  
 573-882-2691

## About the Doctoral Degree

Programs are individually tailored to meet students' objectives and to culminate in an original research dissertation. The PhD builds upon the MS programmatic areas. The three current focus areas are Operations Research and Statistics, Manufacturing/Production/Service Systems and Human/Enterprise Systems. Other focus areas are in development. Fundamental IE knowledge in each is expected. The basic goals of the PhD program are to provide students with a solid understanding of the theoretical bases for the latest tools and techniques of systems analysis and design, an extensive experience in applying these analyses and design tools and techniques, and research experience in the development of new tools or applications of existing techniques to design or analyze problems.

## Application Deadlines

Applications accepted all year.  
 Fall decision dates: March 1  
 Spring decision date: September 1

## Minimum Criteria to be Considered for Admission

- Minimum BS GPA: 3.3/4.0; MS GPA: 3.5/4.0
- Minimum OVERALL IELTS scores: 6.0; or Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	350	700
On or After August 1, 2011	143	155

- Foreign Language: No foreign language is required in either program.
- Completed master's thesis or equivalent (Non-thesis MS is not considered).
- Compatible research interests with a member of the IMSE faculty.
- BS in Math is very welcome in OR focus.

**Note:** Only highly qualified students are accepted for advisement in the PhD program. The faculty looks for excellence in undergraduate and graduate work, high GRE scores, thesis training, and strong indications of research potential.

## Notification

This department does not use "rolling admission." Applicants will be notified within a month after decision date.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the IMSE Graduate Program:*

- 3 letters of recommendation
- Statement of Purpose
- Curriculum Vitae (CV)
- GRE scores
- English thesis or draft (in PDF file or hard copy)

## TA/RA Hiring

This academic department does **not** have any function of financial Aid. Rather, IMSE hires TA/RA automatically based on the department needs. No separate application or contacts are necessary; all top ranked applicants will be considered.

## Degree Completion Requirements

The granting of a PhD requires completion of five major requirements:

1. A qualifying examination,
2. A course of study (Study Plan),
3. Comprehensive examination,
4. Acceptance of dissertation proposal, and
5. Final public defense of the completed dissertation.



## Information Technology

Dong Xu, Chair  
 College of Engineering (BS in Computer Science and BS Information Technology)  
 College of Arts and Science (BA in Computer Science)  
 201 Engineering Building West  
 (573) 884-1887  
[engineering.missouri.edu/cs](http://engineering.missouri.edu/cs)

The information technology (IT) degree program was launched in 2005 with a gift from AT&T/SBC. IT students collaborate with students from other disciplines to create software applications, produce videos and films and use technology to solve a wide range of complex problems. The program proves attractive to students because of its distinguished faculty and state-of-the-art facilities that greatly exceed what is available at competing institutions.

### Faculty

**Professor** Y. Shang\*\*, C. R. Shyu\*\*, D. Xu\*\*, W. Zeng\*\*, Y. Zhao\*\*, X. Zhuang\*\*

**Associate Professor** J. Cheng\*\*, Y. Duan\*\*, W. L. Harrison\*\*, M. Jurczyk\*\*, T. Kazic\*\*, K. Palaniappan\*\*, Y. Saab\*\*, G. K. Springer\*\*, J. Uhlmann\*\*

**Assistant Professor** R. Chadha\*\*, P. Calyam\*\*, D. Korkin\*\*

**Associate Teaching Professor** D. Musser\*

**Adjunct Professor** J. M. Keller\*\*, S. Nair\*\*, M. Skubic\*\*

**Adjunct Associate Professor** G. DeSouza\*\*

**Adjunct Assistant Professor** M. Becchi\*\*, M. Popescu\*\*

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 449)
- BS in Information Technology (p. 449)
  - with emphasis in Information Systems (p. 450)
  - with emphasis in Media Technologies (p. 451)
  - with emphasis in Networks and Wireless Technologies (p. 451)
- Minor in Information Technology (p. 451)

#### Advising Contact

Adrianna Wheeler  
 113 EBW  
 (573) 884-6342  
[wheeleral@missouri.edu](mailto:wheeleral@missouri.edu)

#### Scholarship Information Contact

Dr. Michael Jurczyk  
 121 EBW  
 (573) 884-8869  
[jurczyk@missouri.edu](mailto:jurczyk@missouri.edu)

This degree program is offered by the Computer Science Department within the College of Engineering. Career opportunities include database

administration, web design, cyber security, game development, film production, and more.

### Graduate

While the College of Engineering does not offer a graduate degree specifically in Information Technology, it does offer a number of graduate degrees in closely related areas such as Computer Science (p. 425), and Computer Engineering (p. 420). The University also offers a number of information technology degrees in its other Colleges, and through interdisciplinary programs such as Health Informatics (p. 610), Health Administration (p. 607), or Informatics (p. 613). Or you may browse a complete list of degree options (p. 5) at the University of Missouri.

### Undergraduate

## Department Level Requirements - Information Technology

There are no Department level requirements for the Bachelor of Science in Information Technology. Please see the Major Program Requirements (p. 449) for further details.

## BS in Information Technology

### Major Program Requirements

To receive the Bachelor of Science Degree in Information Technology, the candidate must successfully complete 126 semester hours of credit including the following distribution: Computer Science (CMP SC) course requirements - 54 hours of CMP SC/INFOTC core courses, 12 hours of related math and business courses, 9-12 hours of science, 15-22 hours of courses in a minor and any remaining hours for elective courses. The BS IT degree requires the completion of at least 9 hours of mathematics and statistics including 3 hours of business calculus. An INFOTC student can earn a minor in a related area outside of INFOTC/CMP SC.

Information Technology students must earn a C-range grade or better in all INFOTC/CMP SC courses that are prerequisites for other INFOTC/CMP SC courses that the student takes. To graduate, a student must earn a cumulative UM grade point average of 2.0 or better and a 2.0 grade point average or better in all CMP SC/INFOTC courses.

The Engineering Career Services Office, W1052C Laffer Hall, can assist students in searching for employment opportunities and for internship/co-op positions.

These course requirements apply to students beginning full-time Fall 2013.

In addition to the major core requirements, students must complete all University graduation requirements including University general education, as well as all degree and college or school requirements. See course descriptions for prerequisites.

### Major Core Requirements

Computer science courses		21
CMP_SC 1000	Introduction to Computer Science	1
CMP_SC 1050	Algorithm Design and Programming I	3
CMP_SC 2050	Algorithm Design and Programming II	3

CMP_SC 2830	Introduction to the Internet, WWW and Multimedia Systems	3
CMP_SC 3380	Database Applications and Information Systems	3
CMP_SC 4320	Software Engineering I	3
CMP_SC 4970	Senior Capstone Design I	3
CMP_SC 4980	Senior Capstone Design II	2
<b>Information Technology Core Courses</b>		<b>9</b>
INFOTC 2610	Audio/Video I	3
INFOTC 2810	Fundamentals of Network Technology	3
INFOTC 2910	Cyber Security	3
<b>Information Technology Technical Electives</b>		<b>24</b>
Choose from below or with advisor approval (minimum of 12 hours at 3000 level or above):		
CMP_SC 3530	UNIX Operating System	3
CMP_SC 4380	Database Management Systems I	3
CMP_SC 4830	Science and Engineering of the World Wide Web	3
INFOTC 1610	Introduction to Entertainment Media	3
INFOTC 2620	Computer Modeling and Animation I	3
INFOTC 3620	Computer Modeling and Animation II	3
INFOTC 3610	Audio/Video II	3
INFOTC 3640	Digital Effects	3
INFOTC 4400	C#/.NET Development	3
INFOTC 4500	Team-Based Mobile Device Application Development	3
INFOTC 4640	Digital Effects II	3
<b>Mathematics and Business Courses</b>		<b>12</b>
MATH 1300	Finite Mathematics	3
MATH 1400	Calculus for Social and Life Sciences I	3
STAT 2500	Introduction to Probability and Statistics I	3
MANGMT 3000	Principles of Management	3
or IMSE 4750	Entrepreneurial Innovation Management: Enterprise Conception	
or MRKTNG 4650	e-Marketing	

## Science Concentration

Twelve hours in science are required including one 2-semester sequence in which both courses include laboratories. If student completes a minor by pursuing the formal course requirements for minors in a department outside Computer Science, only 9 credit hours of science with one lab are required.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CMP_SC 1000	1	CMP_SC 2050	3
CMP_SC 1050	3	INFOTC or CMP_SC Elective	3
MATH 1400	3	MATH 1300	3

Constitutional/State Law Elective	3	ENGLSH 1000	3
Behavioral Science	3	Humanities/Fine Arts	3
General Elective	2	General Elective	1
	<b>15</b>		<b>16</b>
Second Year			
Fall	Credits	Spring	Credits
INFOTC or CMP_SC Elective	3	CMP_SC 2830	3
INFOTC or CMP_SC Elective	3	INFOTC 2610	3
INFOTC or CMP_SC Elective	3	INFOTC or CMP_SC Elective 3000/4000	3
STAT 2500	3	Minor	3
Humanities/Fine Arts Course	3	Science Course	4
	<b>15</b>		<b>16</b>
Third Year			
Fall	Credits	Spring	Credits
CMP_SC 3380	3	INFOTC 2910	3
INFOTC 2810	3	CMP_SC 4320	3
Minor	3	Science Course with Lab	5
Social/Behavioral Course	3	Minor	3
General Elective	5	General Elective	2
	<b>17</b>		<b>16</b>
Fourth Year			
Fall	Credits	Spring	Credits
CMP_SC 4970	3	CMP_SC 4980	2
INFOTC or CMP_SC Elective 3000/4000	3	INFOTC or CMP_SC Elective 3000/4000	3
INFOTC or CMP_SC Elective 3000/4000	3	Humanities/Fine Arts Course	3
Business Course (MANGMT 3000, IMSE 4750 or MRKTNG 4650)	3	Minor	3
Minor	3	General Elective	5
	<b>15</b>		<b>16</b>
Total Credits: 126			

## BS in Information Technology with Emphasis in Information Systems

### Major Program Requirements

Students are no longer being accepted into this emphasis area. Students should refer to the degree requirements for the BS in Information Technology (p. 449).

## **BS in Information Technology with Emphasis in Media Technologies**

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### **Major Program Requirements**

Students are no longer being accepted into this emphasis area. Students should refer to the degree requirements for the BS in Information Technology (p. 449).

### **Semester Plan**

A sample plan of study has not been designed for this emphasis. Students should refer to the semester plan for the BS in Information Technology (p. 449), or contact the academic department for assistance with academic planning.

## **BS in Information Technology with Emphasis in Networks and Wireless Technologies**

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### **Major Program Requirements**

Students are no longer being accepted into this emphasis area. Students should refer to the degree requirements for the BS in Information Technology (p. 449).

### **Semester Plan**

A sample plan of study has not been designed for this emphasis. Students should either refer to the semester plan for the BS in Information Technology (p. 449), or contact the academic department for assistance with academic planning.

## **Minor in Information Technology**

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A minor in Information Technology is offered through the College of Engineering. To obtain a minor, a student must complete courses in a sequence approved by the Department of Computer Science. The student must earn a 2.0 GPA in all courses counting toward the minor. At least 9 hours must be taken in residence at MU. A total of 15 credit hours are required.

The following courses are required for sequence one. At least 9 hours must be at the 2000 level or above. For other possible sequences, contact the department.

INFOTC 2610	Audio/Video I	3
INFOTC 3640	Digital Effects <sup>1</sup>	3
INFOTC 4640	Digital Effects II <sup>2</sup>	3
INFOTC or CMP_SC Electives		6
Total Credits		15

<sup>1</sup> Prerequisite: INFOTC 1610 or INFOTC 2610

<sup>2</sup> Prerequisite: INFOTC 3640

## Mechanical and Aerospace Engineering

R. Tzou, Chair  
College of Engineering  
E2412 Lafferre Hall  
(573) 882-2785  
TzouR@missouri.edu

Melanie M Carraher, Administrative Associate  
Mechanical & Aerospace Engineering  
E2412 Lafferre Hall  
(573) 882-2085  
carrahermm@missouri.edu

The Department of Mechanical and Aerospace Engineering is one of 9 academic departments within the College of Engineering at the University of Missouri.

Established in 1891, this ABET accredited program is home to more than 800 total undergraduate and graduate students and about 27 faculty.

### Faculty

**Professor** C. L. Chen\*\*, J. K. Chen\*\*, A. S. El Gizawy\*\*, Z. F. Feng\*\*, S. K. Khanna\*\*, C. A. Kluever\*\*, S. J. Lombardo\*\*, H. Ma#, N. D. Manning\*\*, P. F. Pai\*\*, R. D. Tzou\*\*, Y. Zhang\*\*

**Associate Professor** U. W. Cho\*, R. C. Fales\*\*, H. Li\*\*, Y. Lin\*\*, S. P. Neal\*\*, D. E. Smith\*\*, R. A. Winholtz\*, Q. Yu\*\*

**Teaching Associate Professor** G. L. Solbrekken\*\*

**Teaching Assistant Professor** S. Naz\*\*

**Research Professor** V. Gruzdev, N. Kim, L. Chen, C. Wilson, X. Han

**Resident Instructor** R. T. Whelove

**Professor Emeritus** W. L. Carson\*, R. C. Duffield, A. D. Krawitz\*, D. E. Wollersheim\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 454)
- BSME in Mechanical Engineering (p. 454)
  - with emphasis in Aerospace Engineering (p. 455)

#### Advising and Scholarship Contact

Gary L. Solbrekken, Undergraduate Director  
solbrekkeng@missouri.edu

Shannon Kirk, Advisor  
kirksd@missouri.edu

The Department of Mechanical and Aerospace Engineering prepares students for productive careers in mechanical engineering related disciplines. The program focuses on instruction in the thermal and mechanical systems areas as defined by the Accreditation Board for Engineering and Technology (ABET). To support that mission, the Department has been divided into the focus areas of Design and

Manufacturing, Dynamics and Controls, Materials, and Thermal and Fluid Sciences. (NOTE: Focus areas are not listed on transcripts or diplomas.)

The department endeavors to present a strong experimental program through laboratory experiences to expose undergraduate students to modern instrumentation and measurement methodologies. Students work in well-equipped laboratories in design optimization, engineering computation, fluid power dynamics and control, materials, structural dynamics, measurement and instrumentation, laser processing, heat transfer and fluid dynamics, stress measurement and nondestructive evaluation.

The MU Mechanical Engineering program offers a Bachelor of Science in Mechanical Engineering (BSME) and prepares students for practice of the profession in industry or government or for further study toward other degrees such as the JD, MD, MS and PhD.

#### Mission Statement

The mission of the Mechanical and Aerospace Engineering Department is to:

prepare our students for successful careers in the mechanical engineering profession,  
conduct high quality and innovative research, and  
serve the community and industry providing educational and research resources

#### Program Educational Objectives

The educational objectives of the undergraduate program in Mechanical Engineering are to produce graduates who (during the first several years following graduation)

are able to apply the analytical, experimental, and computational techniques to solve engineering problems associated with the design and manufacture of devices, machines and systems (a,b,e,k);  
are able to synthesize and analyze integrated thermal/fluid and mechanical systems (a,c,e,k);  
are able to communicate effectively and work collaboratively on multidisciplinary teams (d,g);  
contribute to society and the profession through professional activities, and understand the impact of engineering solutions on a diverse and global society and their professional and ethical responsibility (f,h,i,j);  
engage in life-long learning necessary to advance professionally through continued education and training (a,h,i,j);  
succeed in graduate studies in mechanical engineering or a related field if pursued (a-k).  
Note: letter(s) in parentheses indicates ME Program Outcome(s).

#### Program Outcomes

Students from the Mechanical Engineering program will attain (by the time of graduation):

a. an ability to apply knowledge of mathematics, science, and engineering

a1. a knowledge of chemistry and calculus-based physics with depth in at least one;

a2. an ability to apply advanced mathematics through multivariate calculus and differential equations;

a3. familiarity with statistics, linear algebra, and numerical methods;

b. an ability to design and conduct experiments, as well as to analyze and interpret data;

c. an ability to design thermal, fluid, and mechanical systems, components, or processes to meet desired needs within realistic

constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;

- d. an ability to function on multi-disciplinary teams;
- e. an ability to identify, formulate, and solve mechanical engineering problems;
- f. an understanding of professional and ethical responsibility;
- g. an ability to communicate effectively in oral, written and graphical forms;
- h. the broad education necessary to understand the impact of engineering solutions global, economic, environmental, and societal context;
- i. a recognition of the need for, and an ability to engage in, life-long learning;
- j. a knowledge of contemporary issues in mechanical engineering;
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice in the areas of design and manufacturing, dynamics and controls, thermal and fluid systems, and mechanics and materials.

## Double Majors and Dual Degrees

Dual majors and dual degrees are possible at the undergraduate level. These could lead to degrees in the College of Engineering and the College of Arts and Sciences or the College of Agriculture. Dual enrollments could also lead to two engineering majors within the College of Engineering. Any of these dual enrollments would add to the traditional 126-credit undergraduate degree program. Consult with the directors of undergraduate studies of the departments involved for further information.

## MAE Honors Program

The MAE Honors Program follows the general rules, regulations and philosophy of the College of Engineering Honors Program, and as such is intended to encourage, facilitate and reward independent study by high-ability undergraduate students.

The heart of the program is an undergraduate honors project, undertaken and completed by the time of graduation while enrolling in 1 to 6 credits of MAE 4995 Undergraduate Honors Research Mechanical & Aerospace Engineering. The academic credit for the honors project (1-6 credits in MAE 4995 replaces an equivalent number of credits of technical or MAE elective. The project is conducted under the direction of an MAE professor (honors advisor) who is selected by the student, with agreement by the professor. The project culminates in an honors thesis, which is read and approved by the honors advisor and then approved by the chair of the MAE honors committee. A finished copy of the honors thesis, signed by the honors advisor and second reader, is required for satisfactory completion of the project.

### Academic Qualifications for the Honors Program

In the case of a transfer student, transferred credit plus MU credit must average 3.0/4.0. A student is typically eligible for the honors program at the junior year of their undergraduate program.

The successful honors scholar is given a degree of flexibility in the program of study. Additionally, honors scholars may reduce the credits required for degree completion to the University minimum (i.e., 120 credits) by substituting graduate course credits through dual enrollment

(undergraduate/graduate at MU) during the last two semesters of the undergraduate program.

Honors students must maintain and graduate with a 3.0 overall GPA.

In the case of a transfer student, transferred credit plus MU credit must average 3.0/4.0. A student is typically eligible for the honors program at the junior year of their undergraduate program.

The successful honors scholar is given a degree of flexibility in the program of study. Additionally, honors scholars may reduce the credits required for degree completion to the University minimum (i.e., 120 credits) by substituting graduate course credits through dual enrollment (undergraduate/graduate at MU) during the last two semesters of the undergraduate program.

## Graduate

College of Engineering  
E2413 Lafferre Hall  
573-884-8610  
<http://engineering.missouri.edu/mae/>

**Director of Graduate Studies:** Frank Feng

- MS in Mechanical and Aerospace Engineering (p. 456)
- PhD in Mechanical and Aerospace Engineering (p. 456)

## About Mechanical & Aerospace Engineering

Like markets merging together to create a global economy, this decade has approached the exciting frontier of joint research. The marriage of Mechanical Engineering to related fields has contributed to a new "Interdisciplinary Era". In meeting the challenges brought on by this co-operative approach to engineering, the Department of Mechanical & Aerospace Engineering (MAE) at the University of Missouri has broadened its scope in both education and research while maintaining strengths in the fundamental disciplines: Dynamics & Control, Design & Manufacturing, Materials & Solids and Thermal & Fluid Science Engineering. Such well-established academic traditions in the undergraduate and graduate curriculum as well as nationally renowned research programs are the basis for MAE having become the largest department in the College of Engineering at MU. An equally important aspect contributing to the quality of the MAE department is the aggressive pursuit of funding, by our faculty, to establish nationally recognized research programs. Well-earned support through sizable funding from both federal agencies and industry are valuable resources in the promotion of our graduate research and undergraduate teaching.

## Career Opportunities

Graduate programs are planned to prepare students for advanced professional engineering careers. In recognition of the broad nature of the field of mechanical and aerospace engineering, considerable latitude in programs is encouraged so students may prepare for employment in industry, education and government. The usual purpose of a PhD program is to prepare a person for a career in research or teaching. The program is oriented toward research culminating in a dissertation suitable for publication.

## Areas of Study

A student may pursue an area of concentration selected from AI/expert systems, automation, bioengineering, combustion, control, creep and plasticity, design optimization, numerical methods, computational fluid dynamics, fracture mechanics, heat transfer, interactive computer graphics, laser diagnostics, manufacturing systems, materials science, mechanical syntheses, mechatronics, mechanics, parallel computation, residual stress, robotics, thermal systems design and management and ultrasonic nondestructive evaluation.

## Licensure

Information on degree requirements for engineering licensure is detailed under Professional Engineering Registration.

## Facilities and Equipment

The department has several specialized laboratories in aerosol mechanics, combustion, computer control, creep and fracture mechanics, fluid mechanics and heat transfer, manufacturing, materials science and structural dynamics.

Besides the modern instrumentation and equipment normally found in well-equipped mechanical and aerospace engineering laboratories, the department has, or has access to, such specialty items as MTS and Instron material and structural test equipment, wind tunnels, X-ray and a scanning electron microscope facility, computer control systems, a scanning laser vibrometer, a microscale heat transfer and electronic coding laboratory, an experimental stress laboratory, a fluid power laboratory and the university research reactor.

## Information Technology and Computing

A combination of the campus Division of Information Technology and the Engineering Technical Services (ETS) provided advanced engineering computation for College of Engineering faculty and students. CAD/CAM and graphics are the primary emphasis, although artificial intelligence, multiple high-level programming languages and computational and simulation libraries also are available.

The College of Engineering operates one high performance enterprise server, two super minicomputers and 17 HP workstations. The ETS also provides hardware/software support, locally, to nine College of Engineering departments and their affiliated research centers. These units are networked via Ethernet to the superminicomputers operated by the College of Engineering.

The Division of IT operates two remote terminal sites in the Engineering Buildings East. The University also supports an extensive computer system consisting of IBM mainframe computers, remote terminal sites, and PC and Macintosh labs throughout the campus.

## Financial Aid from the Program

Admission decisions to the graduate program are made without considerations of a student's financial need. Once admitted, a student may be considered for fellowships, research assistantships (RAs) and teaching assistantships (TAs). Awarding of fellowships is initiated by the department. RAs are awarded by individual faculty members. A student may apply by contacting faculty members directly. Application forms for TAs are available in the department office. International students are not eligible for TAs in their first semester of study. For specific departmental requirements, please refer to the MAE Graduate Handbook. Please see

the department website for information on how to contact the professors individually about research assistantships offered.

## Undergraduate

### Department Level Requirements - Mechanical & Aerospace Engineering

There are no Department Level Requirements for Mechanical and Aerospace Engineering. Degree details may be found at the Bachelor of Science in Mechanical and Aerospace Engineering (p. 454) page.

### BSME in Mechanical Engineering

#### Major Program Requirements

The MAE curriculum allows students to transfer among departments during the first two years. Students concentrate on departmental requirements during the junior year. The senior year includes three MAE electives that allow students to develop individual study programs. This enables students to complete a traditional program or create their own with special emphasis on system design, materials, manufacturing, energy systems, controls, or aerospace.

Experience in design is integrated throughout the required courses in the curriculum and culminates in the capstone design sequence. The capstone design experience integrates earlier technical work with economic, safety and environmental considerations. The projects are primarily obtained from industrial or private business clients. The presentations of project results are made to a review panel consisting of members of the faculty, the MAE Industrial Advisory Council and representatives of the client firms.

#### Major Core Requirements

In addition to the University general education and graduation requirements, the Department of Mechanical and Aerospace Engineering requires the following courses:

CHEM 1320	College Chemistry I	4
ENGINR 1100	Engineering Graphics Fundamentals	2
ENGINR 1110	Solid Modeling for Engineering Design	1
IMSE 2710	Engineering Economic Analysis	3
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 4100	Differential Equations	3
STAT 4710	Introduction to Mathematical Statistics	3
or IMSE 2110	Probability and Statistics for Engineers	
PHYSICS 2750	University Physics I	5
PHYSICS 2760	University Physics II	5
ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2100	Circuit Theory for Engineers	3
ENGINR 2200	Intermediate Strength of Materials	3
MAE 2300	Thermodynamics	3
MAE 1000	Introduction to Mechanical Engineering	1

MAE 2100	Programming and Software Tools	2
MAE 3100	Computational Methods for Engineering Design	4
MAE 2600	Dynamics	3
MAE 3200	Engineering Materials	4
MAE 3400	Fluid Mechanics	3
MAE 3600	Dynamic Systems and Control	3
MAE 3800	Instrumentation and Measurements Laboratory	3
MAE 3900	Mechanical Design I	3
MAE 4300	Heat Transfer	3
MAE 4500	Manufacturing Methods	3
MAE 4800	Thermal and Fluid Science Laboratory	4
MAE 4900	Mechanical Design II	3
MAE 4980	Senior Capstone Design	3
Elective in approved area of Engineering, Science or Math, 3000-level or above		3
<b>Electives</b>		
MAE 4000 +: MAE elective		9

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available..

First Year			
Fall	Credits	Spring	Credits
MAE 1000	1	MATH 1700	5
MATH 1500	5	ENGLSH 1000	3
ENGINR 1100	2	CHEM 1320	4
Approved Political Science or History Course	3	ENGINR 1110	1
Social/Behavioral Science Elective	3	Social/Behavioral Science Elective	3
	14		16
Second Year			
Fall	Credits	Spring	Credits
MATH 2300	3	MAE 2100	2
PHYSICS 2750	5	MATH 4100	3
ENGINR 1200	3	PHYSICS 2760	5
Humanities/Fine Arts Elective	3	ENGINR 2200	3
		Humanities/Fine Arts Elective	3
	14		16
Third Year			
Fall	Credits	Spring	Credits
MAE 3100	4	IMSE 2110 or STAT 4710	3
MAE 2300	3	MAE 3400	3
MAE 2600	3	ENGINR 2100	3
MAE 3200	4	MAE 3900	3
	14		12
Fourth Year			
Fall	Credits	Spring	Credits
IMSE 2710	3	MAE 4800	4
MAE 4300	3	MAE 4900	3

MAE 3800	3	MAE 4000+ Elective	3
MAE 3600	3	Humanities/Fine Arts Elective	3
MAE 4500	3		
	15		13
Fifth Year			
Fall	Credits		
3000+ Technical Elective	3		
MAE 4000+ Elective	3		
MAE 4000+ Elective	3		
MAE 4980	3		
	12		
Total Credits: 126			

## BSME in Mechanical Engineering with emphasis in Aerospace Engineering

### Major Program Requirements

The MAE curriculum allows students to transfer among departments during the first two years. Students concentrate on departmental requirements during the junior year. The senior year includes three MAE electives that allow students to develop individual study programs. This enables students to complete a traditional program or create their own with special emphasis on system design, materials, manufacturing, energy systems, controls, or aerospace.

Experience in design is integrated throughout the required courses in the curriculum and culminates in the capstone design sequence. The capstone design experience integrates earlier technical work with economic, safety and environmental considerations. The projects are primarily obtained from industrial or private business clients. The presentations of project results are made to a review panel consisting of members of the faculty, the MAE Industrial Advisory Council and representatives of the client firms.

### Options

The senior year includes three MAE electives that allow students to develop individual study programs. This enables students to complete a traditional program or create their own program with special emphasis on system design, materials, manufacturing, energy systems or controls.

An Aerospace Emphasis area is available to students wanting to pursue careers in the aerospace industry. Completing the aerospace emphasis requires taking at least three senior MAE 4000+ electives from a selection of available courses. These can be chosen from the broad areas of structures/materials, thermal/propulsion, aerodynamics/fluids, flight mechanics/dynamics/controls, and design. Upon completion of the appropriate coursework, an Aerospace Emphasis is shown on the students transcript.

An entrepreneurship option may be added by taking and in the sixth and seventh semesters before the . These three courses combine to give the student a fundamental understanding of entrepreneurial methods. This option will add credits to the degree program.

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

## Semester Plan

A sample plan of study has not been designed for this major. Students should either refer to the plan designed for the BSME in Mechanical Engineering or contact the academic department for assistance with academic planning.

## Graduate

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## MS in Mechanical and Aerospace Engineering

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### Admission Contact Information

Marilyn Nevels (nevelsma@missouri.edu)  
E2413 Mechanical & Aerospace Engineering  
Columbia, MO 65211  
573-884-8610

### Application Deadline for all applicants

Fall deadline: May 31  
Spring deadline: October 31  
Summer deadline: April 30

### Admission Criteria

- BS in same or closely related field
- Minimum GPA: 3.0 during last 2 years
- Minimum GRE Score: 298 combined score on Verbal and Quantitative sections
- Minimum TOEFL score: 61
- Minimum academic IELTS overall score: 5.5

**Note:** Lower GPAs require special action and substantiation, such as good test scores on the GRE or other recognized examinations.

### How to apply to the MAE master's program:

**Step 1:** Send one copy of required application materials to the Graduate School or MAE Department:

**Step 2:** Required documents:

- Official Transcripts (all Universities and Colleges attended) - only one copy mailed to the Graduate School or MAE Department (please send only one copy)
- TOEFL/IELTS score - sent to University by ETS
- 3 letters of recommendation - uploaded or mailed to the MAE Department
- GRE score - sent to us by ETS (Institution Code 6875 Department Code 1502)
- Statement of Objectives - one page letter telling about yourself and the area you will study if accepted
- CV/Résumé

### Send to:

Mechanical & Aerospace Engineering, Graduate Admissions  
ATTN: Marilyn Nevels  
E2413 Lafferre Hall, Columbia, MO 65211  
Questions: 573-884-8610

## Plan of Study

A plan of study is developed by the student and the advisor, subject to approval. The minimum degree requirement is 30 hours with a minimum of 18 hours at the 8000 level. Included within the 30 hours must be a special project report or thesis. A special project consists of three to five hours of MAE problems.

Alternatively, programs directed toward a thesis shall include three to eight hours of MAE 8990 (Research). A thesis or a report is approved by designated faculty committees and is deposited in the department libraries.

Passing the MS final committee fulfills the degree requirements.

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## PhD in Mechanical and Aerospace Engineering

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### Admission Contact Information

Marilyn Nevels (nevelsma@missouri.edu)  
E2413 Mechanical & Aerospace Engineering  
Columbia, MO 65211  
573-884-8610

### Application Deadlines for all Applicants

Fall deadline: May 31  
Spring deadline: October 31  
Summer deadline: April 30

### Admission Criteria

- Minimum GPA: 3.0
- Strong record in the MS program
- Minimum GRE score: 298 combined score on Verbal and Quantitative sections
- Minimum TOEFL score: 61
- Minimum Academic IELTS Overall score: 5.5

**Note:** Doctoral degree program applicants are closely and individually reviewed.

### How to apply to the MAE doctoral program:

**Step 1:** Send one copy of required application materials to the Graduate School or MAE Department:

**Step 2:** Required documents:

- Official Transcripts (all Universities and Colleges attended) - **copy mailed to Graduate School or MAE Department (please send only one copy)**
- TOEFL/IELTS score - sent to MAE Department by ETS
- 3 letters of recommendation (preferably from MS advisor and 2 other letters) - uploaded in ApplyYourself or mailed to the MAE Department



- GRE score - sent to MAE Dept by ETS (Institution Code 6875  
Department Code 1502)
- Statement of Objectives - one page letter telling about yourself and the  
area you will study if accepted
- CV/Resume

*Send to:*

Mechanical & Aerospace Engineering, Graduate Admissions

ATTN: Marilyn Nevels

E2413 Lafferre Hall, Columbia, MO 65211

Questions: 573-884-8610

## Degree Requirements

A minimum of 72 semester hours are required including the credit hours taken during the MS program. Students who received the MS degree from other than MU may transfer a maximum of 30 hours from their MS course work.

A doctoral student must satisfy a special requirement, either proficiency in foreign languages or a collateral field. The collateral field requires a minimum of nine hours of course work in one area other than MAE.

## Plan of Study

The PhD candidate plans a plan of study and research under the immediate supervision of an adviser and in close cooperation with the doctoral program committee approved by the dean of the Graduate School upon the department's recommendation.

## Qualifying Examination

A qualifying examination is given soon after the student begins doctoral study. Successful completion of this examination is a prerequisite to formal acceptance into the PhD program.

Students with an MS from MU or another accredited U.S. engineering program will be exempt from the qualifying examination if their MS GPA and total GRE scores satisfy a departmental exemption rule. See <http://engineering.missouri.edu/mae/degree-programs/phd-mae/> for more information.

## Comprehensive Examination & Dissertation

A comprehensive examination is given after all course work and language or collateral requirements have been satisfied. Upon completion of the plan of study and research a final examination, essentially a defense of the dissertation, is administered.

## Nuclear Engineering

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### About the Nuclear Science Engineering Program

The Nuclear Engineering Program at University of Missouri was established in 1964 and conferred its first Master of Science degree in that same year.

Undergraduate students may pursue an academic minor in nuclear engineering (a baccalaureate degree is not offered at this time).

The master's program is designed for those entering students with a B.S. degree in engineering or in chemistry or physics. Students from other fields will be considered on an individual basis. Those students who have attained a B.S. degree in nuclear engineering may be given revised curricula depending on their backgrounds and the requirements of the specific program in which they are enrolled.

The Ph.D. program is typically tailored to fit the academic needs and research goals of our students. The graduate certificates provide students and working professionals with the opportunity to develop unique skills and expertise for jobs in the areas of nuclear material protection, control and accountability.

### Faculty

**Professor** Z. Chen, B. Deng, J. Gahl\*, T. K. Ghosh\*\*, N. Islam\*, S. Jurisson\*, S. Loyalka\*\*, P. Pinhero, M. Prelas\*\*, J. D. Robertson\*, R. Thompson\*\*

**Associate Professor** S. Kovaleski, J. Kwon, K. Trauth\*, R. Winholz

**Assistant Professor** M. Bernards,

**Associate Teaching Professor** G. Solbrekken

**Assistant Teaching Professor** S. Naz

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Minor in Nuclear Engineering (p. 458)

While MU does not offer undergraduate degrees specifically in nuclear engineering, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Engineering, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

#### Contact for prospective students (those intending to apply):

Dr. Naz Islam, Director of Graduate Studies  
319 Engineering Building West  
Columbia, MO 65211  
573-882-7570 or islamn@missouri.edu

#### Nuclear Engineering Program

Dr. John M. Gahl, Director

207 Engineering Building West

Columbia, MO 65211

573-882-5345 or gahlj@missouri.edu

- MS in Nuclear Engineering (p. 459)
- PhD in Nuclear Engineering (p. 459)
- Graduate Certificate in Nuclear Engineering (p. 460)
- Graduate Certificate in Nuclear Safeguards Science and Technology (p. 460)

### About the Nuclear Science Engineering Program

The Nuclear Engineering Program at University of Missouri was established in 1964 and conferred its first Master of Science degree in that same year. Educational programs are closely connected with the research foci of participating faculty members. The master's program is designed for those entering students with a B.S. degree in engineering or in chemistry or physics. Students from other fields will be considered on an individual basis. Those students who have attained a B.S. degree in nuclear engineering may be given revised curricula depending on their backgrounds and the requirements of the specific program in which they are enrolled. The Ph.D. program is typically tailored to fit the academic needs and research goals of our students. The graduate certificates provide students and working professionals with the opportunity to develop unique skills and expertise for jobs in the areas of nuclear material protection, control and accountability.

### Illustrative Areas of Study

Course topics include nuclear materials management, aerosol mechanics, reactor safety analysis, nuclear energy conversion, reactor physics, reactor design, nondestructive testing and measurement, radiative heat transfer, neutron spectrometry, neutron and gamma ray transport, neutron activation analysis, nuclear waste management, nuclear plasma research, health physics, magnetic resonance imaging, radiation therapy and alternative and renewable energy concepts.

### Students Admitted in 2012 and Earlier

For nuclear engineering students admitted in 2012 and earlier (i.e., to the Nuclear Science Engineering Institute), the contact is

Dr. Tushar Ghosh  
NSEI Director of Graduate Studies  
E2433 Lafferre Hall  
573-882-9736  
ghosht@missouri.edu

## Undergraduate

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### Minor in Nuclear Engineering

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The Minor in Nuclear Engineering is one of three minors offered within the Nuclear Engineering academic curriculum to provide students the opportunity to obtain education and training in nuclear sciences. It is designed for students from Biology, Chemistry, Engineering, Physics or related disciplines who are interested in nuclear power.

The minor requires a minimum of 15 credits of course work. As background preparation, the minor requires math through differential equations and two semesters of calculus-based physics.

**Required courses:**

ENGINR 2300	Engineering Thermodynamics	3
NU_ENG 4315	Energy Systems and Resources	3
NU_ENG 4346	Introduction to Nuclear Reactor Engineering I	3
NU_ENG 4391	Nuclear Radiation Detection	3
or CHEM 4600	Introduction to Radiochemistry with Lab	
<b>Select one additional course from the list below:</b>		
NU_ENG 2201	Topics in Nuclear Engineering	3
NU_ENG 4303	Radiation Safety	3
NU_ENG 4330	Science and Technology of Terrorism and Counter Terrorism	3
NU_ENG 4353	Introduction to Fusion	3
ECE 7550	Introduction to Plasmas	3

## Graduate

### MS in Nuclear Engineering

**Contact for prospective students (those intending to apply):**

Dr. Naz Islam, Director of Graduate Studies  
 319 Engineering Building West  
 Columbia, MO 65211  
 573-882-7570 or islamn@missouri.edu

**Nuclear Engineering Program**

Dr. John M. Gahl, Director  
 207 Engineering Building West  
 Columbia, MO 65211  
 573-882-5345 or gahlj@missouri.edu  
 engineering.missouri.edu/nuclear/

### Preparation for the Program

Students with degrees in physics or chemistry are generally adequately prepared for the nuclear engineering graduate program. Those from other backgrounds may be required to complete engineering undergraduate courses in thermodynamics, advanced engineering mathematics and the full complement of calculus-based physics, based on the student's particular experience.

### Application Deadlines

Fall deadline: March 1  
 Spring deadline for International students: September 1  
 Spring deadline for Domestic Students: October 1  
 Applications received after those time frames will be reviewed for acceptance only as time permits.

### Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE score: none set
- Minimum GPA: 3.0 during last 2 years
- Undergraduate degree (with a strong math and physics background) in an engineering field, physics, biology, chemistry or mathematics from an accredited institution.

### Required Application Materials

*To the Graduate School*

All required Graduate School documents

- 3 letters of recommendation and the online recommendation form from previous instructors or technical employers who are familiar with the student's qualifications for graduate study, submitted directly online through the application. (If the student is applying to the PhD program, one of these letters must be from the MS adviser.)
- Statement of Purpose (uploaded via online application)

*To the Nuclear Engineering Program*

- Official GRE score report (Use Department Code 1609)

### Degree Completion Requirements

The nuclear engineering master's degree program requires 31 hours, including a research project or thesis. The requirements are based on the assumption that the student is entering graduate study with a bachelor's degree in engineering from an ABET-accredited school. An original research project is required either in the form of a three-credit master's project or a six-credit master's thesis. Typical time-to-degree completion for the master's degree is 18 months.

### PhD in Nuclear Engineering

**Contact for prospective students:**

Dr. Naz Islam, Director of Graduate Studies  
 319 Engineering Building West  
 Columbia, MO 65211  
 573-882-7570 or islamn@missouri.edu

**Nuclear Engineering Program**

Dr. John M. Gahl, Director  
 207 Engineering Building West  
 Columbia, MO 65211  
 573-882-5345 or gahlj@missouri.edu  
 engineering.missouri.edu/nuclear/

### Application Deadlines

Fall deadline: March 1  
 Spring deadline for International students: September 1  
 Spring deadline for Domestic Students: October 1  
 Applications received after those time frames will be reviewed for acceptance only as time permits.

### Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE score: none set
- Minimum GPA: 3.0 during last 2 years
- Undergraduate degree (with a strong math and physics background) in an engineering field, physics, biology, chemistry or mathematics from an accredited institution.

### Required Application Materials

*To the Graduate School*

- All required Graduate School documents

- 3 letters of recommendation and the online recommendation form from previous instructors or technical employers who are familiar with the student's qualifications for graduate study, submitted directly online through the application. (If the student is applying to the PhD program, one of these letters must be from the MS adviser.)
- Statement of Purpose (uploaded via online application)

#### *To the Nuclear Engineering Program*

- Official GRE score report (Use Department Code 1609)

## Qualifying Examination

The PhD program is a research program and is tailored to meet specific educational needs. To qualify for the research phase of the PhD program, the student must pass a comprehensive, multi-part qualifying examination, usually administered during the first semester of study for the PhD.

## PhD Plan of Study

If the student is entering the PhD program, the planned course of study will be individually evaluated by the nuclear engineering faculty. A comprehensive examination covering the student's dissertation topic is required at least seven months before anticipated graduation. The PhD degree is a research degree, with a suitable dissertation topic to be chosen in the respective field and usually requires 24 classroom credits of advanced courses beyond the MS degree and 18 credits of research. Typical time-to-degree completion for the PhD degree is three years past the MS degree.

## Graduate Certificate in Nuclear Engineering

### Eligibility & Mission

The objective of the graduate certificate in Nuclear Engineering is to provide graduate students and professional, non-degree students from various engineering and science departments at MU with a unique opportunity to develop expertise in nuclear engineering that will enhance their job opportunities in the nuclear field.

### Requirements for Graduate Certificate in Nuclear Engineering

Students will be required to take the 12 credit hours of coursework from the Nuclear Engineering (NE) degree program curriculum. Co-listed courses with the Nuclear Science and Engineering Institute NE classes may be considered towards this requirement. As permitted by the University Policy regarding Graduate Certificate offerings, a maximum of 6 credit hours may be counted for both degree course credit within their department and the Graduate Certificate in Nuclear Engineering. However, total credit hours needed to complete their degree need not exceed Departmental or Graduate School requirements. Students will be required to take courses that broaden their knowledge and understanding in nuclear engineering.

The student must complete a Change of Academic Program form to enter the program. The student must also complete the "Course of Study for Graduate Certificate" form, which must be approved by Nisei before taking any courses. Without this prior approval, the Nisei has the authority to deny the certificate.

A student's advisor and graduate committee from the host department and the Graduate Studies Director in the Nuclear Science and Engineering Institute will approve the courses. The selection of courses is restricted to the 7000 level or above and all courses must be successfully completed with a final grade of 'B' or above. Courses must be selected from the list shown in Table 1 at the certificate's website (<http://nisei.missouri.edu/graduateCertification.html>), and documented on the Graduate School's "Course of Study for Graduate Certificate" form. Course credit hours for the certificate could also be applied towards the total credit hours needed for the departmental degree requirements, if accepted by the student's department.

### Course Work

Students should take at least one course from each of the first three clusters listed in Table 1. The student may choose their fourth course from either the Basic Radiation Science Cluster or from any of the four (I, II, III, IV) clusters at the certificate's site (<http://nisei.missouri.edu/graduateCertification.html>).

A minimum of 12 credit hours must be documented (using the Course of Study for Graduate Certificate form) in order to qualify for the Graduate Certificate in Nuclear Engineering.

## Graduate Certificate in Nuclear Safeguards Science and Technology

For additional information about this certificate, contact:

Dr. John Gahl, professor of Electrical Engineering, 573-884-7414, [GahlJ@missouri.edu](mailto:GahlJ@missouri.edu)

### Certificate Objectives and Requirements

The objective of offering the Graduate Certificate in Nuclear Safeguards is to provide graduate students and professional, non-degree-seeking, students in various engineering disciplines with an opportunity to develop unique skills and expertise that will enhance their performance in jobs requiring knowledge of nuclear material protection, control and accountability.

The graduate certificate program serves degree-seeking graduate students and also functions as a stand-alone graduate certificate program for professional, non-degree-seeking students. Both degree-seeking and non-degree-seeking students will be required to take four specific classes (12 credit hours) involving nuclear science, policy and safeguards. The student must complete a Change of Academic Program form to enter the program. The student must also complete the "Course of Study for Graduate Certificate" form, which must be approved by NSEI before taking any courses. Without this prior approval, the NSEI has the authority to deny the certificate.

For MU students, a maximum of 6 credit hours may be counted for both degree course credit within their department and the Graduate Certificate in Nuclear Safeguards. However, total credit hours needed to complete their degrees need not exceed departmental or Graduate School requirements (see the Graduate School catalog for additional information contact Dr. Gahl)

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## Nuclear Safeguards Science and Technology Certificate Plan of Study

Four specific classes, comprising 12 hours of course credit, are required for a student to receive this graduate certificate in nuclear safeguards:

NU_ENG 7335	Nuclear Safeguards Science and Technology	3
NU_ENG 7331	Nonproliferation Issues for Weapons of Mass Destruction	3
NU_ENG 7303	Radiation Safety	3
NU_ENG 7391	Nuclear Radiation Detection	3
Total Credits		12

## Additional Minors and Certificates - Engineering

### Undergraduate

- Minor in Aerospace (p. 462)
- Minor in Energy (p. 463)
- Minor in Medical/Health Physics (p. 463)
- Minor in Naval Science (p. 463)
- Minor in Radioenvironmental Sciences (p. 463)
- Minor in Computational Neuroscience (p. 462)

### Graduate

## Undergraduate

### Minor in Aerospace

#### Purpose

- To provide a fundamental grounding in aerospace engineering
- To prepare students to be competitive for positions in aerospace-oriented industries

Students will take courses from the 4 fundamental areas of aerospace engineering:

- aerodynamics
- aerospace structures
- flight mechanics
- propulsion

#### To Apply

- Meet with your advisor sophomore/junior year to plan minor courses into your schedule.
- Complete the necessary course work (at least 18 credit hours)
- Submit the application below in the semester before you are graduating.
- It will then appear on your diploma.

### Required Course Work

#### Must take both:

MAE 3400	Fluid Mechanics	3
MAE 3600	Dynamic Systems and Control	3

#### Select at least 2 from:

MAE 4210	Aerospace Structures	3
MAE 4390	Aerospace Propulsion	3
MAE 4420	Intermediate Fluid Mechanics	3
MAE 4430	Introduction to Computational Fluid Dynamics and Heat Transfer	3
MAE 4440	Aerodynamics	3
MAE 4450	Gas Dynamics	3
MAE 4620	Aircraft Flight Mechanics	3
MAE 4630	Space Flight Mechanics	3
MAE 4940	Aircraft Design	3

#### Auxiliary Courses

A maximum of 6 credit hours can be counted toward the minor

MAE 4001	Topics in Mechanical and Aerospace Engineering (When taken as topics title "Applied Finite Element Analysis")	3
MAE 4280	Introduction to Finite Element Methods	3
MAE 4320	Design of Thermal Systems	3
MAE 4600	Advanced Mechanics of Materials	3
MAE 4720	Modern Control	3
MAE 4920	Advanced Computational Design	3

### Contact

Shannon Kirk (<http://engineering.missouri.edu/person/kirks>)

Undergraduate Academic Advisor

Mechanical & Aerospace Engineering (<http://mae.missouri.edu>)

phone: 573-882-2684

email: [kirkSD@missouri.edu](mailto:kirkSD@missouri.edu)

## Minor in Computational Neuroscience

Computational neuroscience is becoming an important tool for neuroscientists to understand how complex brain circuits work, for example, what causes post-traumatic stress disorder. This intersection of engineering and neuroscience is allowing great advances in health care, manufacturing and communication.

#### Required for all students:

ECE/BIO_SC 4580	Computational Neuroscience	4
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Select 2 courses from the following list:

BIO_SC 3700	Animal Physiology	
BIO_SC 4310	Physics in Cell and Developmental Biology	
BIO_SC 4500	Neurobiology	
BIO_SC 4560	Sensory Physiology and Behavior	
BIO_SC 4986	Neurology of Motor Systems	
BIO_SC 4988	Nerve Cells and Behavior	
BIOL_EN 4070	Bioelectricity	
BIOL_EN 4080	Engineering Computation	
PHYSICS 4310	Physics in Cell and Developmental Biology	
PHYSICS 4500	Computational Biological Physics	

**For students majoring in Engineering, Physics, Math, Psychology or Statistics, choose 6 credits from the following list of courses:**

BIO_SC 1010	General Principles and Concepts of Biology ( with BIO_SC 1020)	3
BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
BIO_SC 2300	Introduction to Cell Biology	4
F_W 1100	Introductory Zoology with Laboratory	5
PSYCH 2210	Mind, Brain, and Behavior	3
PSYCH 4210	Physiological Psychology	3

**For students majoring in Biology choose 6 credits from the following list of courses:**

PHYSICS 1220	College Physics II	4
PHYSICS 2760	University Physics II	5
CMP_SC 1040	Introduction to Problem Solving and Programming	3
BIOL_EN 2080	Introduction to Programming for Engineers	3
Seminar for Undergraduates		1

## Minor in Energy

Energy engineering requires many different types of engineers, and this minor lets you choose from several different tracks to fit your career interests. The minor requires completion of 18 credit hours between the core and the tracks.

### Required Core Courses:

ENGINR 2100	Circuit Theory for Engineers	3
or ECE 2100	Circuit Theory I	
MAE 2300	Thermodynamics	3
CH_ENG 3261	Chemical Engineering Thermodynamics I	3
ECE 4470	Sustainable Electrical Energy Resources	3
IMSE 2710	Engineering Economic Analysis	3

### Electric Utility Generation Track

ECE 3470	Introduction to Power Engineering	3
ECE 3510	Electromagnetic Fields	3
MAE 4320	Design of Thermal Systems	3
MAE 4660	Vibration Analysis	3
ECE 4410	Power Electronics I	4
CV_ENG 4250	Environmental Regulatory Compliance	3

### Electric Utility Transmission & Distribution Track

ECE 3470	Introduction to Power Engineering	3
ECE 3510	Electromagnetic Fields	3
ECE 4410	Power Electronics I	4
CV_ENG 4250	Environmental Regulatory Compliance	3

### Energy Infrastructure and Efficiency Track

MAE 4320	Design of Thermal Systems	3
MAE 4340	Heating and Air Conditioning	3
MAE 4660	Vibration Analysis	3
MAE 4290	Welding Engineering	3
CV_ENG 4250	Environmental Regulatory Compliance	3

### Energy Storage Track

ECE 4001	Topics in Electrical and Computer Engineering	3-4
ECE 4410	Power Electronics I	4
CH_ENG 4464	Electrochemical Reaction Engineering Science	3

## Minor in Medical/Health Physics

The Minor in Medical/Health Physics is one of three minors offered within the Nuclear Engineering academic curriculum to provide students the opportunity to obtain education and training in the nuclear sciences. It is designed for students from Biology, Chemistry, Engineering, Physics or related discipline who are interested in the biological effects of radiation in medical utilization and in occupational health and safety.

The minor requires a minimum of 15 credits of course work. As background preparation, the student must have had the prerequisites of a minimum of college algebra and two semesters of college physics.

### Required courses:

NU_ENG 4303	Radiation Safety	3
NU_ENG 4328	Introductory Radiation Biology	3
NU_ENG 4391	Nuclear Radiation Detection	3
or CHEM 4600	Introduction to Radiochemistry with Lab	

### Select additional courses from the below options:

NU_ENG 2201	Topics in Nuclear Engineering	3
NUCMED 3256	Clinical Nuclear Medicine I	2
CHEM 4170	Medicinal Chemistry	3
NU_ENG 4319	Physics and Chemistry of Materials	3
NUCMED 4329	Radiopharmaceuticals in Nuclear Medicine	3
BIOL_EN 4570	Fluorescent Imaging	3
BIOCHM 3630	General Biochemistry	3

## Minor in Naval Science

A minor in Naval Science is available upon the completion of 20 semester hours to include 11 hours of the lower level and 9 hours of the upper level Naval Science curriculum.

## Minor in Radioenvironmental Sciences

The Minor in Radioenvironmental Sciences is one of three minors offered within the Nuclear Engineering academic curriculum to provide students the opportunity to obtain education and training in the nuclear sciences. It is designed for students from Biology, Chemistry, Engineering, Physics or related discipline who are interested in the environmental aspects of radiation and radioactive materials.

The minor requires a minimum of 15 credits of course work. As background preparation, the student must have had the prerequisites of a minimum of college algebra and two semesters of college physics.

### Required courses:

NU_ENG 4303	Radiation Safety	3
NU_ENG 4328	Introductory Radiation Biology	3
NU_ENG 4391	Nuclear Radiation Detection	3
or CHEM 4600	Introduction to Radiochemistry with Lab	

### Select two additional courses form the list below:

NU_ENG 2201	Topics in Nuclear Engineering	3
NU_ENG 4330	Science and Technology of Terrorism and Counter Terrorism	3
NU_ENG 4350	Nuclear Forensic Analysis	3
NU_ENG 4379	Particulate Systems Engineering	3
CHEM 3300	Fundamentals of Physical Chemistry	3
CHEM 4280	Environmental Chemistry	3
CV_ENG 3200	Fundamentals of Environmental Engineering	4
CV_ENG 4220	Hazardous Waste Management	3
CV_ENG 4250	Environmental Regulatory Compliance	3

## School of Health Professions

### Administration

Kristofer J. Hagglund, Dean  
 504 Lewis Hall  
 (573) 882-8011  
 umcshpadvising@missouri.edu

### Advising and Scholarship Contact

SHP Student Services Office  
 504 Lewis Hall  
 (573) 882-8011

The School of Health Professions is Missouri's only state-supported health professions school on a campus with an academic health care center. It is uniquely positioned to educate highly qualified health care professionals committed to fulfilling the mission of improving society through education, service and discovery in diagnostic, medical imaging, and rehabilitation sciences. The school is credited with establishing the nation's first baccalaureate degree program in respiratory therapy and the first master's degree program in diagnostic medical ultrasound. Its six departments and eight accredited academic programs have long and distinguished histories. Graduates of the School of Health Professions are nationally recognized leaders in their fields.

The school offers undergraduate degrees with majors in Athletic Training, Communication Science and Disorders, Diagnostic Medical Ultrasound, Health Sciences, Occupational Therapy, Respiratory Therapy, Radiologic Sciences with emphasis in Radiography or Nuclear Medicine Technology, and Clinical Laboratory Sciences with an emphasis in Medical Technology. The school offers graduate degrees in Communication Science and Disorders with an emphasis of Speech-Language Pathology, Diagnostic Medical Ultrasound, Occupational Therapy and Physical Therapy.

Students gain valuable experience by participating in nationally recognized service centers including The Adult Day Connection, The Health Connection, the Speech and Hearing Clinic, Robert G. Comb's Language Preschool and more than eight hundred fieldwork sites.

### Undergraduate

- Admissions
- Exploratory Courses
- Required Entry Level Courses
- School of Health Professions Scholars Guaranteed Admission Program (SHarP Scholars)
- International Admissions
- Academic Regulations
- Enrolling in Other Institutions Simultaneously
- Advising
- Career Placement

### Admissions

Undergraduate students are enrolled in the School of Health Professions for academic advisement in order to complete University general education (p. 18) and prerequisite courses. Students will be advised by faculty of the department in which they have declared a major, or by an

advisor in the Student Services Office. Students should contact the SHP Advising Office to ensure satisfactory progress toward completion of the prerequisites.

Admission to the University and to the School of Health Professions as a pre-professional student does not constitute admission as a candidate for most Bachelor of Health Science degree programs. Pre-professional students are admitted to candidacy for the BHS only when they have been selected to participate in the professional component of a program. Application deadlines and requirements vary for each program (an application is not required for the health sciences programs). Students are strongly encouraged to seek advising to ensure they are making satisfactory progress towards pre-requisites, MU General Education (p. 18), and program requirements.

### Exploratory Courses

The School of Health Professions offers introductory courses and experiences to provide information about career opportunities in these areas. These courses are listed below:

HLTH_SCI 1000	Introduction to the Health Professions	2
NUCMED 1000	Orientation to Nuclear Medicine	1
OC_THR 1000	Introduction to Occupational Therapy	1
PH_THR 1000	Introduction to Physical Therapy	1
RS_THR 1000	Introduction to Respiratory Therapy	1
DMU 1000	Introduction to Diagnostic Medical Ultrasound	1
C_S_D 1000	Introduction to Communication Science and Disorders	1
CL_L_S 1000	Orientation to Clinical Laboratory Science	1

### Required Entry-level Courses

To be admitted into or continue in the School of Health Professions, all students with 55 or more credits must have completed MATH 1100 and ENGLSH 1000, or their equivalents, with grades in the C range or higher.

While completing prerequisite requirements, students must make formal application for admission to the professional component of the program of their choice. Enrollment is limited and is governed by program admission committees. Application to the professional component is also required for transfer students.

In addition to academic record, attributes such as interpersonal skills, motivation, attitude, interest, commitment and knowledge of the field are considered in selecting students to participate in the professional phase of any program. Applicants may also be evaluated on school and college aptitude tests, pattern of academic achievement, verbal expression, extracurricular activities and motivation demonstrated by employment and volunteer activities.

To achieve the goals of diversity and equal opportunity, the School of Health Professions encourages the participation of minority students in its programs.

The application deadlines for the professional component of each program are shown below.

Professional Program	Application Deadline	Classes Begin
Athletic Training	Second Friday, Spring Semester, Freshman	Fall



Communication Science and Disorders	Feb. 1, sophomore	Fall
Occupational Therapy	Dec. 31, sophomore	Summer
Radiography	Feb. 1, sophomore	Summer
Physical Therapy	Jan. 24, senior	Summer
Nuclear Medicine	Dec. 1, junior	Fall
Respiratory Therapy	Feb. 1, sophomore	Summer
Diagnostic Medical Ultrasound	Feb. 1, sophomore	Summer
Clinical Laboratory Science	Nov. 1, junior	Summer
Health Sciences	N/A, freshman	Fall/Spring

## School of Health Professions Scholars Guaranteed Admission Program (SHarP Scholars)

### Eligibility Requirements for the SHarP Scholar's Program:

- Minimum 30 composite ACT score (1330 SAT).
- Top 10% high school (HS) rank at the time of application.
- Performance in college courses completed prior to HS graduation will be considered by the admissions committee.
- Completed applications must be submitted by March 1<sup>st</sup> during the senior year in high school or November 15<sup>th</sup> during the freshman year at MU.
- Four (4) hours of clinical observation in the discipline of choice (documented on the SHarP application). All applications must include recommendations from a high school teacher and from a high school counselor or principal.

**\*\* Students who are accepted as SHarP Scholars may also have to complete additional application requirements prior to entering their professional program. Specific program requirements are communicated to students upon acceptance as SHarP Scholars.**

Application materials are available in the School of Health Professions Student Services Office and on the school's website (<http://shp.missouri.edu>).

Students accepted as SHarP Scholars who maintain participant status at MU are guaranteed admission into one of the following degree programs:

- Athletic Training
- Clinical Laboratory Sciences with an emphasis in Medical Technology
- Communication Science and Disorders (BHS program only)
- Occupational Therapy
- Diagnostic Medical Ultrasound
- Master of Public Health Program (upon completion of the Health Sciences BHS degree)
- Radiologic Sciences, with emphasis in *Radiography or Nuclear Medicine Technology*
- Respiratory Therapy
- Physical Therapy (Doctor of Physical Therapy program, upon completion of a baccalaureate degree)

## International Admissions

Students whose native language is not English should contact the School of Health Professions for requirements.

## Prerequisite Curriculum Requirements

See the degree requirements in the following pages for specific course requirements in the various programs. The student is responsible for meeting graduation requirements for the program and the University.

## Graduation Requirements

In addition to degree and major requirements, students must complete university graduation requirements (p. 17), which include university general education (p. 18) requirements.

## Degree Core Requirements

The Bachelor of Health Science degree is granted to candidates who have successfully fulfilled all didactic and clinical requirements of the program as described for each area, in addition to all University requirements (p. 17), including University general education (p. 18) requirements.

In addition to the academic and clinical education requirements of a program, students must possess and exhibit those personal qualities and characteristics that are associated with patient welfare and professional trust. These elements are a part of the overall evaluation process for the professional phase of each program. Should it be determined that these qualities are not present in sufficient degree or that a student does not demonstrate satisfactory growth and progress in these areas, the student is subject to dismissal from the program.

## Degree with Honors Requirements

To earn Latin Honors in the School of Health Professions, a student must meet the following requirements:

- 50 graded MU undergraduate credits
- At least a 3.0 MU cumulative GPA
- MU cumulative GPA equal to or greater than 3.5 or
- last 50 graded credits at MU equal to or greater than 3.5
- GPA for each level

Latin Honor	GPA
Cum laude	3.5
Magna cum laude	3.7
Summa cum laude	3.9

## Academic Regulations

### Time Limits on Credits Earned

Contact each department for information on time limits.

### Credits by Examination

Students with previous training or experience may be allowed to earn advanced-standing credit through challenge or equivalency evaluation in certain programs. Contact the Health Professions Student Affairs Office for information pertaining to the awarding of credit for these exams.

## Maximum Credits Enrolled

A student may not enroll for more than 17 credits in a term without permission from the associate dean.

## Independent Study

Students must receive prior approval before enrolling in independent study courses.

## Satisfactory/Unsatisfactory Grades

A student wishing to enroll in a course on an S/U basis must receive permission from the faculty advisor in his or her department and from the SHP Advising Center.

## Enrolling in Other Institutions Simultaneously

Students must receive approval from the SHP Advising Center before enrolling simultaneously at another institution.

## Advising

Students may be assigned a faculty advisor in their program of study or a professional academic advisor in the Office of Student Services.

Students should select an area of interest prior to completing the first two years of college. To assist with career decisions, the School of Health Professions offers introductory courses and experiences to provide information and career opportunities in these areas.

## Career Placement

Graduates of programs in the School of Health Professions are highly recruited and frequently hired prior to receiving degrees. The Career Services office in the School of Health Professions offers résumé, cover letter and personal statement review, mock interviews, and workshops to enhance students' career development. Students are encouraged to seek out and use the Career Services office early in their undergraduate career.

## Graduate

The School of Health Professionals offers a wide variety of programs of study for students interested in careers in healthcare. At the graduate level, we offer degrees in

- Communication Science and Disorders
- Occupational Therapy
- Physical Therapy
- Diagnostic Medical Ultrasound Program
- Nuclear Medicine Program

The Graduate School confers an interdisciplinary **Master's of Public Health (MPH) degree**. The MPH is available in two emphasis areas: **Health Promotion and Policy** or **Veterinary Public Health**. This public health coursework reflects the University of Missouri's strength in the health professions, social work, nursing, medicine, veterinary medicine, and arts and sciences.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Athletic Training

**Program Director:** John M. Rosene

Athletic training is a professional field of study that primarily addresses the well-being of the athlete. The athletic trainer assumes responsibility for the overall health care of the athletic population, particularly having an integral role in the prevention, recognition, care and rehabilitation of athletic injuries. Athletic trainers have been employed in traditional settings that include: high schools, colleges, universities, professional sports teams, hospitals, and rehabilitation clinics. Of late, the practice of athletic training has expanded to include a variety of settings apart from the traditional athletic population which now include: physicians' offices, corporate and industrial institutions, the military, and the performing arts. Regardless of the practice setting, athletic trainers practice athletic training (or provide athletic training services) according to educational preparation and state practice act.

The mission of the University of Missouri Athletic Training Education Program is to be a global leader in providing exceptional learning environments to foster the academic and professional growth of students pursuing the study of athletic training. The curriculum is designed to enhance critical thinking and practical skill application through didactic and clinical experiences with highly trained, experienced professionals representing a variety of disciplines associated with the Sports Medicine team.

The Department of Physical Therapy, Athletic Training Education Program offers a Bachelors of Health Science (BHS) degree in Athletic Training.

*Disclaimer: The Athletic Training Education Program at the University of Missouri is NOT accredited by the Commission on Accreditation of Athletic Training Education (CAATE). Only graduates of CAATE accredited programs are eligible to sit for the Board of Certification examination. The program is anticipating submission of application for accreditation and subsequent site visit for accreditation in spring 2016. Application and site visitation for accreditation does not guarantee accreditation.*

## Faculty

**Associate Teaching Professor** J. M. Rosene\*

**Assistant Teaching Professor** K. M. Belmore, S. P. Wehring

**Clinical Faculty** J. Artioli, P. Beckmann, S. Bishop, C. Hairston, M. Long, T. McClelland, E. McDonnell, A. Mosel, J. Schaefer, R. Sharp

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 467)
- BHS in Athletic Training (p. 467)

## Graduate

While MU does not offer graduate degrees specifically in athletic training, the University does offer post-baccalaureate opportunities in a number of related areas, both within the School of Health Professions, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

### Department Level Requirements - Athletic Training

There are no requirements at the department level for this degree. Please see the BHS in Athletic Training page (p. 467) for degree requirements.

### BHS in Athletic Training

#### Major Program Requirements

The Athletic Training major consists of a one-year pre-professional phase followed by a three-year professional phase. The major is a professional preparation program requiring admission into the program and an extensive clinical component. Clinical experiences are completed at on- and off-campus locations during the three-year professional phase. All required Athletic Training courses, including the PH\_THR 4420 and HTH\_PR 4250 courses, must be completed with a grade of "C" (2.0) or higher. Students may repeat a required course one time to remedy a deficient grade.

Students transferring from other institutions should seek advisement from the school and athletic training education program advisors to select appropriate coursework and to meet admission requirements. In addition to University, college, and Department Level Requirements (p. 467).

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year				
Fall	Credits	Spring	Credits	
MATH 1100	3	ENGLSH 1000	3	
BIO_SC 1010 & BIO_SC 1020	5	ATHTRN 1200	2	
HIST 1100, 1200, or POL_SC 1100	3	Humanities	3	
HLTH_SCI 1000	2	Behavioral/ Social Science	3	
ATHTRN 1100	2	ATHTRN 2100	3	
	15		14	

Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
ATHTRN 2150	3	ATHTRN 2250	3	ATHTRN 3300	3
ATHTRN 2500	3	ATHTRN 2600	3	ATHTRN 3350	2
2000+ Humanities	3	Humanities (Writing Intensive)	3	ATHTRN 3400	3
Elective	3	Elective	3	ATHTRN 3450	2
				(Over 9 credit hours - Overload approval required)	
	12		12		10
Third Year					
Fall	Credits	Spring	Credits		
ATHTRN 3150	3	ATHTRN 3250	3		
ATHTRN 3500	4	ATHTRN 3600	3		
HTH_PR 4250	3	ATHTRN 3700	4		
PH_THR 4420	3	ATHTRN 3800	3		
Elective	3	PH_THR 4790	2		
	16		15		
Fourth Year					
Fall	Credits	Spring	Credits		
ATHTRN 4150	3	ATHTRN 4990	3		
ATHTRN 4500	3	STAT 1300 or ESC_PS 4170	3		
ATHTRN 4970 (Writing Intensive)	3	Electives	7		
Elective	4				
	13		13		
Total Credits: 120					

The Freshman year is considered "pre-professional". Students may apply as early as the freshman year, provided they complete the requirements for application to the BHS in Athletic Training degree program.

## Clinical Laboratory Sciences

### Clinical Laboratory Science

School of Health Professions

605 Lewis Hall

(573) 882-8011

Director: Steven Starr

Clinical Laboratory Scientists make a valuable contribution to patient care by developing, performing and evaluating clinical laboratory procedures. Certified Clinical Laboratory Scientists are skilled scientists who work with the kinds of tests that would confirm a case of diabetes, verify a potentially dangerous drug level, monitor the level of anti-rejection drugs in transplant patients, determine compatibility for organ donation, detect cases of cancer or leukemia, identify the causative microorganism in a blood or wound infection, or detect a cancerous tumor with DNA techniques. Clinical Laboratory Scientists have various levels of responsibility - as staff technologists, research technologists, supervisors, managers, or educators can work in a variety of settings, including hospitals, clinics, laboratories, and research centers.

The Clinical Laboratory Science (CLS) program at MU is a unique collaboration with the University of Nebraska Medical Center in Omaha. The CLS program includes three years of prerequisite coursework, requiring 16 hours of both Biology and Chemistry, and 11 months in the professional phase of the CLS program. The professional year begins in May, with 11 weeks of coursework and clinical lab rotations (in the University of Nebraska's Medical Center in Omaha. After the initial 11 weeks in the program, students return to Columbia and complete the CLS coursework online and clinical laboratory rotations at Boyce and Bynum Pathology Laboratories, P.C. and the University of Missouri Hospital and Clinics. Students graduate with a Bachelor of Health Science degree in Clinical Laboratory Science from the University of Missouri with a Certificate in Medical Technology from the University of Nebraska Medical Center

### Faculty

**Associate Professor** R. E. Oliver\*

**Clinical Professor** M. M. Hdeib\*, G. D. Heggie\*

**Clinical Associate Professor** C. M. Allen, K.S. Moss\*, S. L. Strickland\*

**Clinical Assistant Professor** S. Anderson, D. W. Clem\*, M. Feldman, E. M. Hdeib\*, L. M. Lair, K. Merideth\*, M. C. Sebacher, P. A. Tew

**Clinical Instructor** S. D. Anderson, J. L. Keely, S. W. Parker, S. Starr

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 469)
- BHS in Clinical Laboratory Sciences with Emphasis in Medical Technology (p. 469)

The Department of Cardiopulmonary and Diagnostic Sciences offers the Bachelor of Health Science (BHS) with majors in Clinical Laboratory Science (with an emphasis area of Medical Technology), Diagnostic

Medical Ultrasound, Respiratory Therapy, and Radiological Sciences. Students majoring in Radiological Sciences must complete emphasis areas in Radiography or Nuclear Medicine Technology.

### Graduate

While MU does not offer graduate degrees specifically in clinical laboratory sciences, the University does offer post-baccalaureate opportunities in a number of related areas, both within the School of Health Professions, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Undergraduate

## Department Level Requirements - Clinical Laboratory Sciences

There are no requirements at the department level for this degree. Please see the BHS in Clinical Laboratory Sciences with Emphasis in Medical Technology (p. 469) page for degree requirements.

## BHS in Clinical Laboratory Sciences with Emphasis in Medical Technology

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

Professional Certification: Upon completion of the program, students are eligible to take the Medical Technology Licensure examination given by the American Society for Clinical Pathology (ASCP).

#### Major core requirements

Prerequisites		
ENGLSH 1000	Exposition and Argumentation	3
COMMUN 1200	Public Speaking	3
MATH 1100	College Algebra	3
STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	

#### Social science requirement

Select one of the following:			3
HIST 1100	Survey of American History to 1865		
HIST 1200	Survey of American History Since 1865		
POL_SC 1100	American Government		
Social science/behavioral science requirement			6
Humanities electives			6
Electives			6-8
Writing intensive elective *			3

MPP 3202	Elements of Physiology	5
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#### Biological sciences elective (at least 16 hours of Biology)

BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
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BIO_SC 2200	General Genetics	4
BIO_SC 2300	Introduction to Cell Biology	4
MICROB 3200	Medical Microbiology and Immunology	4
or BIO_SC 3750	General Microbiology	
MICROB 4304	Immunology	3
<b>Physical sciences requirement (at least 16 hours of Chemistry)</b>		
CHEM 1320	College Chemistry I	4
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 3200	Quantitative Methods of Analysis with Lab	4
BIOCHM 3630	General Biochemistry	3
or CHEM 2110	Organic Chemistry II	
<b>Core Requirements</b>		
CL_L_S 4412	Clinical Laboratory Science Theory, Application and Correlation	5
CL_L_S 4414	Chemistry I	4
CL_L_S 4415	Chemistry II	3
CL_L_S 4416	Clinical Hematology I	4
CL_L_S 4417	Clinical Hematology II	3
CL_L_S 4418	Clinical Microbiology I	4
CL_L_S 4419	Clinical Microbiology II	3
CL_L_S 4420	Clinical Immunology	1
CL_L_S 4422	Immunohematology I	3
CL_L_S 4423	Immunohematology II	2
CL_L_S 4424	Phlebotomy	1
CL_L_S 4426	Body Fluid Analysis	1
CL_L_S 4970	Clinical Laboratory Management I	2
CL_L_S 4980	Clinical Lab Management II	3
<b>Total Credits</b>		<b>118-120</b>

\* Depending on course, may count toward another requirement in addition to the Writing Intensive Requirement.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
HLTH_SCI 1000	2	BIO_SC 1500	5
MATH 1100	3	CL_L_S 1000	1
CHEM 1320	4	CHEM 1330	4
PSYCH 1000	3	ENGLSH 1000	3
HIST 1100, 1200, or POL_SC 1100	3		
	15		13
Second Year			
Fall	Credits	Spring	Credits
BIO_SC 2200	4	BIO_SC 2300	4

CPD 4955 (Writing Intensive)	3	CHEM 3200	4		
CHEM 2100	3	MPP 3202	5		
COMMUN 1200	3	Behavior/Social Science Course (level 2000+)	3		
	13		16		
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
MICROB 3200	4	MICROB 4303	2	CL_L_S 4414	1
BIOCHM 3630	3	Humanities	3	CL_L_S 4416	1
STAT 1300	3	CPD 4480	3	CL_L_S 4418	1
Humanities Course	3	Elective	6	CL_L_S 4422	1
				CL_L_S 4424	1
				CL_L_S 4426	1
	13		14		6
Fourth Year					
Fall	Credits	Spring	Credits		
CL_L_S 4414	3	CL_L_S 4412	5		
CL_L_S 4416	3	CL_L_S 4415	3		
CL_L_S 4418	3	CL_L_S 4417	3		
CL_L_S 4420	1	CL_L_S 4419	3		
CL_L_S 4422	2	CL_L_S 4423	2		
CL_L_S 4426	1	CL_L_S 4980 (WI)	3		
CL_L_S 4970	2				
	15		19		
Total Credits: 124					

**NOTE:** Third Year - Summer to be completed in Omaha.

## Communication Science and Disorders

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Judith Goodman, Chair  
School of Health Professions  
301 Lewis Hall  
(573) 884-2940  
mucsd@health.missouri.edu

### Advising Contact

Jill S. Diener  
(573) 882-8011

Communication Science and Disorders includes the study of normal language, speech and hearing across the life span, as well as communication disorders that result from biological, environmental and behavioral factors. Communication Science and Disorders includes the professions of speech-language pathology and audiology.

Speech-language pathologists evaluate the speech and language of children and adults to determine whether problems exist in such areas as voice, articulation, fluency and receptive or expressive language. They also plan and carry out programs for the treatment of these problems. Audiologists evaluate hearing, identify hearing loss and participate in the rehabilitation of persons with hearing impairments.

The professions of speech-language pathology and audiology require master's or doctoral degrees. Acceptance to an undergraduate program does not guarantee acceptance to a graduate program. Refer to the Graduate Catalog for information about the MHS and PhD degrees (p. 471).

## Faculty

**Associate Professor** J. C. Goodman\*\*, S. A. Wagovich\*\*  
**Assistant Professor** M. Fagan\*\*, T. Lever\*\*,  
**Clinical Associate Professor** B. L. Brinkman, D. R. Fritz, B. McLay\*  
**Clinical Assistant Professor** L. B. Lawrence\*, M. A. Scheneman  
**Clinical Instructor** G. Hull, G. Nolan  
**Research Associate Professor Emerita** L. S. Day\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 472)
- BHS in Communication Science and Disorders (p. 472)

## Graduate

Julie Aston  
301 Lewis Hall  
573-884-2940  
<http://shp.missouri.edu/csd/>

- MHS in Communication Science and Disorders (p. 473)

## About Communication Science and Disorders

The field of Communication Science and Disorders, or CSD, encompasses the related but distinct disciplines of speech-language pathology (SLP), audiology and speech, language, and hearing sciences (SLHS). Speech-language pathologists and audiologists are professionals educated in human communication and its disorders. Speech-language pathologists diagnose and treat disorders such as delayed language development, stuttering, articulation and voice problems. Audiologists specialize in the prevention, identification, assessment and rehabilitation of hearing disorders. Speech, language, and hearing scientists are professionals concerned with exploring trends in the communication sciences, as well as developing strategies for improving or adding to the knowledge base within the fields of speech-language pathology and audiology.

MU established its first independent master's and doctoral programs in speech-language pathology and audiology in the 1940s. The MU master's degree program in speech-language pathology has been continuously accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology since 1966. An active local chapter of the National Student Speech Language Hearing Association is sponsored by the program.

The master's degree prepares students for national certification in speech-language pathology and for professional clinical practice in both health care and educational settings. The doctoral degree involves a program of research and advanced study beyond the clinical master's degree in preparation for a career in research and college teaching or administration.

## Career Opportunities

A wide variety of work settings are available to speech-language pathologists and audiologists. Possibilities range from hospitals, clinics, and rehabilitation centers to schools, colleges and universities, government agencies, and private practice. Speech, language, and hearing scientists work primarily in colleges and universities, research labs and government agencies. Professional certification in speech-language pathology and audiology is awarded by the American Speech-Language-Hearing Association (ASHA). The master's degree, which is the entry-level degree for speech-language pathologists, typically takes two to three years beyond the undergraduate degree depending on the student's undergraduate field of study. Students wishing to pursue a career in audiology will need to attend a program that offers clinical doctorate in audiology (AuD), the entry-level degree for audiologists.

## Facilities and Resources

The department uses many cooperative facilities in Columbia, both on and off the MU campus, as clinical and scientific resources. Among these are the University Hospitals and Clinics, Rusk Rehabilitation Center, Ellis Fischel Cancer Center, Truman Memorial Veterans Hospital, Adult Day Connection, Assistive Technology Evaluation Center, Thompson Center for Autism and Neurodevelopmental Disorders, Missouri Rehabilitation Center, and Columbia Public Schools.

Other cooperative facilities are available both within and outside the state. The department operates the MU Speech and Hearing Clinic, a diagnostic and treatment center serving individuals with communication disorders from the campus and the community, the MU Robert G. Combs Language Preschool, and the Accent Modification and Pronunciation

Program. In addition, there are many research opportunities for students in the laboratories of individual faculty where they may gain experience with sophisticated equipment for research and clinical evaluation in normal and disordered speech, language, and hearing. A master's thesis option is available to students interested in conducting research.

## Funding

All graduate students are considered for available scholarships, fellowships, work-study grants, traineeships and graduate teaching and research assistantships

## Undergraduate

### Department Level Requirements - Communication Science & Disorders

There are no requirements at the department level for this degree.

### BHS in Communication Science and Disorders

#### Major Program Requirements

Students are required to apply to the Communication Science and Disorders major. Applications into the BHS program are considered once a year, and they must be submitted by February 1 of the student's sophomore year. Applicants must have completed at least 42 hours of college credit before applying, and students who are admitted must have completed 60 hours of college credit before beginning coursework as Communication Science and Disorders majors. A minimum GPA of 2.75 on a four-point scale and a composite score of 22 or above on the ACT are required for acceptance into the BHS program. Meeting the minimum criteria and declaring a major of pre-Communication Science and Disorders do not guarantee acceptance into the program.

In addition to university (p. 17), college and degree requirements, including university general education (p. 18), students must complete the following:

#### Major core requirements

ENGLISH 1000	Exposition and Argumentation	3
COMMUN 1200	Public Speaking	3
PSYCH 1000	General Psychology	3
PSYCH 2410	Developmental Psychology	3
MATH 1100	College Algebra	3-5
or MATH 1160	Precalculus Mathematics	
STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	
or ESC_PS 4170	Introduction to Applied Statistics	

#### Social Sciences Requirement

HIST 1100	Survey of American History to 1865	3
or HIST 1200	Survey of American History Since 1865	
or POL_SC 1100	American Government	

#### Biological Science Requirement

Select one of the following:		5
BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory	
BIO_SC 1500	Introduction to Biological Systems with Laboratory	

#### Physical Science Requirement

PHYSICS 1150	Concepts in Physics	3-4
or PHYSICS 1210	College Physics I	
or CHEM 1100	Atoms and Molecules with Lab	

One Biology, Chemistry or Physics lab required	1
Humanities Electives	6

#### Communication science and disorders courses

C_S_D 1060	Human Language	3
C_S_D 2120	Survey of Communication Disorders	3
C_S_D 3010	American Phonetics	3
C_S_D 3020	Normal Language Development	3
C_S_D 3210	Anatomy and Physiology of the Speech Mechanism	2
C_S_D 3220	Speech Acoustics	2
C_S_D 3230	Hearing Science	3
C_S_D 4020	Language Disorders in Children	3
C_S_D 4030	Language Disorders of Adults	2
C_S_D 4320	Disorders of Phonology and Articulation	3
C_S_D 4210	Fluency Disorders	2
C_S_D 4220	Voice Disorders	1
C_S_D 4330	Introduction to Audiology	3
C_S_D 4430	Neurophysiology for Speech, Language, and Hearing	3
C_S_D 4900	Clinical Observation in Communication Disorders	2

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
HLTH_SCI 1000*	2	HIST 1100, 1200, or POL_SC 1100	3
PSYCH 1000	3	ENGLISH 1000	3
Humanities Elective	3	COMMUN 1200	3
BIO_SC 1010	3	CHEM 1100	3
BIO_SC 1020	2	Elective*	3
Elective*	2		
	15		15
Second Year			
Fall	Credits	Spring	Credits
C_S_D 1060	3	C_S_D 2120	3
C_S_D 1050*	3	Humanities Elective	3
PSYCH 2410	3	STAT 1200	3
Humanities	3	C_S_D 1100*	5



Elective *	3	FINPLN 1183 *	1
	15		15
<b>Third Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
C_S_D 3210	2	C_S_D 3010	3
C_S_D 3220	2	C_S_D 3020 (Writing Intensive)	3
C_S_D 4430	3	C_S_D 3230	3
C_S_D 4950 *	3	C_S_D 4050 *	3
C_S_D 1200 *	5	LINGST 4610 *	3
	15		15
<b>Fourth Year</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
C_S_D 4020 (Writing Intensive)	3	C_S_D 4030	2
C_S_D 4330	3	C_S_D 4210	2
C_S_D 2150 *	3	C_S_D 4220	1
C_S_D 4945 *	3	C_S_D 4320	3
PSYCH 3140	3	C_S_D 4340	3
		C_S_D 4900	2
		Elective *	2
	15		15
Total Credits: 120			

\* Denotes elective coursework. These specific courses are not required, though the credit hours are required to reach the University requirements of 120 total hours.

## Graduate

### MHS in Communication Science and Disorders

#### Admission Contact Information

Julie Aston mucsd@missouri.edu  
301 Lewis Hall; Columbia, MO 65211  
573-884-2940

#### Admission Criteria

Deadline for Summer entrance (required for all applicants who have completed prerequisite course work in CSD): January 15  
Deadline for Spring entrance (only for applicants without prerequisite course work in CSD): October 15

- Undergraduate GPA: 3.0 (on last 60 hours of course work)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100*	600

\* Minimum TOEFL (iBT) score of 100, with minimum score of 28 on speaking

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000 (preferred)	
On or After August 1, 2011	300 (preferred)	

### Required Application Materials

To the Graduate School:

Online Graduate School application including:

- 3 letters of recommendation submitted online
- Statement of Interest submitted online
- Resume submitted online
- Official GRE scores
- Official Transcripts (including ALL college credits)

To the Communication Science and Disorders Program:

Personal interviews may be requested

### Admission Process

Acceptance for admission to master's level study is determined by the Departmental Graduate Admissions Committee.

### Prerequisite Course Work

If the student's undergraduate major is in a field other than communication disorders, the MHS program will require a minimum of three and a half years. The student will spend the first year and a half of the master's program completing prerequisite course work prior to beginning clinical practicum and graduate course work.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

### Plan of Study

MHS candidates are required to complete a minimum of 48 semester hours in graduate-level courses with grades of B- or higher. No fewer than 24 hours must be earned in 8000/9000-level course work offered by the program. A maximum of 10 hours in clinical practicum courses may be counted toward the 48-hour requirement.

### Thesis Option

The student may choose the thesis option for the master's degree; work toward the thesis may count for up to six hours of credit.

### Examination

During the final semester of course work, we expect master's degree candidates to achieve a passing score on the PRAXIS II Examination in Speech-Language Pathology. This exam serves as the comprehensive examination for the degree. See the program's online Graduate Student Handbook for additional information.

## Diagnostic Medical Ultrasound

### Diagnostic Medical Ultrasound

School of Health Professions  
409 Lewis Hall  
(573) 884-2994  
Director: Moses Hdeib

### Faculty

**Associate Professor** R. E. Oliver\*

**Clinical Professor** M. M. Hdeib\*, G. D. Heggie\*

**Clinical Associate Professor** C. M. Allen, K. S. Moss\*

**Clinical Assistant Professor** S. Anderson\*, D. W. Clem\*, M. Feldman, E. M. Hdeib\*, L. M. Lair, K. Merideth\*, M. C. Sebacher, P. A. Tew

**Clinical Instructor** S. D. Anderson, J. L. Keely, S. W. Parker, S. Starr

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 474)
- BHS in Diagnostic Medical Ultrasound (p. 474)

The Department of Cardiopulmonary and Diagnostic Sciences offers the Bachelor of Health Science (BHS) with majors in Clinical Laboratory Science (with an emphasis area of Medical Technology), Diagnostic Medical Ultrasound, Respiratory Therapy, and Radiological Sciences. Students majoring in Radiological Sciences must complete emphasis areas in Radiography or Nuclear Medicine Technology.

### Graduate

#### Diagnostic Medical Ultrasound

School of Health Professions  
409 Lewis Hall  
(573) 884-2994  
Director: Moses Hdeib

- MHS in Diagnostic Medical Ultrasound (p. 475)

The Master of Health Science in Diagnostic Medical Ultrasound is offered by the School of Health Professions, Department of Cardiopulmonary and Diagnostic Sciences. The Diagnostic Medical Ultrasound Program (DMU) is a 35-40 hours per week, 52 weeks per academic year clinical education program.

### Future Certification and Careers

Upon successfully completing the requirements of the DMU Program, MHS Graduates will be eligible to apply to the American Registry of Diagnostic Medical Sonographers (ARDMS) for registry in Abdomen, Obstetrics and Gynecology, Vascular Technology and Cardiac Ultrasound.

### Financial Aid

Please contact the financial aid office. Some programs require an application and extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Undergraduate

## Department Level Requirements - Diagnostic Medical Ultrasound

There are no requirements at the department level for this degree. Please see the BHS in Diagnostic Medical Ultrasound page (p. 474) for degree requirements.

### BHS in Diagnostic Medical Ultrasound

### Major Program Requirements

The Diagnostic Medical Sonographer uses high-frequency sound waves to perform a variety of diagnostic examinations. The sonographer performs an essential role in the process of data gathering and synthesis required to reach a diagnosis. Ultrasound is a profession requiring a high degree of independence, skill, judgment and knowledge. Sonographers work in hospitals, clinics, private physician offices and other medical facilities performing examinations in their areas of specialization. The Diagnostic Medical Ultrasound (DMU) Program offers multiple educational options.

Any student interested in applying to the DMU Program should seek advisement as soon as possible to assure that all general education and prerequisite courses including the criteria for application have been completed.

Students must complete the courses listed below in addition to degree and university requirements (p. 17), which include university general education (p. 18) requirements.

#### Major core requirements

Prerequisites		
PSYCH 1000	General Psychology	3
CHEM 1100	Atoms and Molecules with Lab	3
COMMUN 1200	Public Speaking	3
BIO_SC 1010	General Principles and Concepts of Biology	3
BIO_SC 1020	General Biology Laboratory	2
ENGLSH 1000	Exposition and Argumentation	3
Select one of the following:		
HIST 1100	Survey of American History to 1865	
HIST 1200	Survey of American History Since 1865	
POL_SC 1100	American Government	
SOCIOL 1000	Introduction to Sociology	3
or RU_SOC 1000	Rural Sociology	
PHYSCS 1210	College Physics I	4
PTH_AS 2201	Human Anatomy Lecture	3

PTH_AS 2203	Human Anatomy Laboratory	2
ESC_PS 4170	Introduction to Applied Statistics	3
CPD 2190	Medical Terminology	3
MATH 1100	College Algebra	3
MPP 3202	Elements of Physiology	5
DMU 1000	Introduction to Diagnostic Medical Ultrasound	1
<b>Core requirements</b>		
DMU 4001	Topics in Diagnostic Medical Ultrasound	3
DMU 4200	Principles of Diagnostic Medical Ultrasound	3
DMU 4234	Clinical Pathophysiology	3
DMU 4309	Normal Ultrasound Clinical	5
DMU 4311	Pathological Images of Ultrasound	3
DMU 4312	Sectional Anatomy	3
DMU 4313	Ultrasound Physics	3
DMU 4314	Abdominal Ultrasound	5
DMU 4318	Gynecology Ultrasound	3
DMU 4320	Obstetrics Ultrasound	3
DMU 4322	Superficial Organs Ultrasound	3
DMU 4325	Ultrasound Clinical Pharmacology and Contrast Agents	3
DMU 4326	Vascular Ultrasound Physics, Instrumentation and Hemodynamics	3
DMU 4330	Vascular Ultrasound Lab	3
DMU 4332	Vascular Ultrasound	4
DMU 4338	Cardiac Ultrasound, Principles and Hemodynamics	3
PHIL 2440	Medical Ethics	3
DMU 4941	Ultrasound Clinical I	7
DMU 4943	Ultrasound Clinical III	6
DMU 4944	Vascular Ultrasound Clinical IV	7
DMU 4993	Ultrasound Clinical II	8
<b>Total Credits</b>		<b>131</b>

## Professional Certification

Upon successfully completing the requirements of the program, BHS graduates are eligible to apply to the American Registry of Diagnostic Medical Sonographers (ARDMS) for certification in Abdomen, Obstetrics and Gynecology and Vascular Technology.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
HLTH_SCI 1000	2	BIO_SC 1010 & BIO_SC 1020	5
MATH 1100	3	ENGLSH 1000	3
PSYCH 1000	3	SOCIOL 1000	3
CHEM 1100	3	Humanities	3

HIST 1100, 1200, or POL_SC 1100	3	DMU 1000	1		
	14		15		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
COMMUN 1200	3	STAT 1300	3	DMU 4200	3
PHYSICS 1210	4	MPP 3202	5	DMU 4312	3
PTH_AS 2201 & PTH_AS 2203	5	CPD 2190	3	CPD 4480	3
Writing Intensive course	3	Humanities (level 2000+)	3		
	15		14		9
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
DMU 4309	5	DMU 4314	5	DMU 4941	7
DMU 4311	3	DMU 4318	3		
DMU 4313	3	DMU 4320	3		
DMU 4315	3	DMU 4322	3		
DMU 4325	3	DMU 4234	3		
	17		17		7
Fourth Year					
Fall	Credits	Spring	Credits		
DMU 4326	3	DMU 4330	3		
DMU 4943	6	DMU 4332	4		
DMU 4993	8	DMU 4944	7		
		DMU 4001	3		
	17		17		
Total Credits: 142					

\*\* DMU 1000 Introduction to Diagnostic Medical Ultrasound required for application to the DMU Program. Prospective students may enroll in the fall semester or the spring semester.

## Graduate

## MHS in Diagnostic Medical Ultrasound

Admission Contact Information  
 Dr. Moses Hdeib hdeibm@health.missouri.edu  
 409 Lewis Hall  
 Columbia, MO 65211  
 573-884-2994

### Admission Criteria

Deadline for spring entrance: December 1

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
55	550

Test of Written English (TWE) - 4.5

- Minimum GRE score: check with Program Director of Graduate Studies
- Undergraduate GPA minimum: 3.00 (A=4.0) for the last 60 hours of college work

Potential applicants who have all the prerequisites for admission to the program should submit their application early (before November) in the fall of the academic year in order to be considered for early acceptance with start in the following spring semester. Please contact the director of graduate studies.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- GRE scores

*To the Diagnostic Medical Ultrasound Program:*

- Departmental Application
- Transcripts

## Degree Requirements

Graduate students must maintain a 3.0 grade point average in all courses required for the degree. Failure to achieve a semester cumulative grade point average of 3.0 in required courses will result in delay of graduation or dismissal from the program. Students are expected to maintain full-time enrollment in the sequenced curriculum and complete the degree requirements as outlined in the course of study.

## For More Information

Moses Hdeib, MD, PhD, RDMS, RDCS, RVT  
Diagnostic Medical Ultrasound  
409 Lewis Hall  
Columbia, MO 65211  
573-884-2994 or send an e-mail Dr. Hdeib: [hdeibm@health.missouri.edu](mailto:hdeibm@health.missouri.edu)

## Health Science

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R. Hogan, Chair  
School of Health Professions  
501 Clark Hall  
(573) 882-8422  
hoganr@health.missouri.edu

The Department of Health Sciences (DHS) is part of the School of Health Professions (SHP), which serves the citizens of Missouri through its outstanding research, community service clinics, and the education of students in the areas of health literacy and health promotion. Faculty in DHS teach courses for the Bachelor of Health Sciences program and are actively involved in a wide range of interdisciplinary research. Our faculty provide expertise in several domains including Public health, Psychology, Sociology, Medical Anthropology, Education, and Social Work. Faculty research covers a wide range of topics including health promotion, health communication, decision support, health disparities for disadvantaged groups, access to healthcare, and suicide prevention. Our research also spans a number of substantive areas including Autism Spectrum Disorders, breast cancer, HIV/AIDS, aging, and adolescent health.

Students can only earn the BHS concurrently with the Masters of Occupational Therapy (p. 480).

Students can only earn the BHS concurrently with the Doctor of Physical Therapy (p. 483).

## Faculty

**Associate Professor** E. Schatz\*

**Associate Clinical Professor** R. Hogan, M. Kunnert

**Associate Teaching Professor** D. Hume\*

**Assistant Professor** N. Cheak-Zamora\*, A. Kabel\*, N. Khosla, W. Majee, V. Shaffer, L. Taliaferro, M. Teti\*, M. Thullen

**Assistant Clinical Professor** K. Flynn Peters

**Assistant Teaching Professor** B. Blackburn, R. Bowman

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 477)
- BHS in Health Science (p. 478)

The Department of Health Sciences' BHS in Health Science degree program is for students who wish to enter non-clinical health careers such as medical case management, corporate wellness, human services, medical sales, pharmaceutical manufacturing and distribution, and more. Graduates of the BHS degree program may also be qualified to enter either graduate or professional health science programs such as Physical Therapy, Health Administration and Public Health. The Health Sciences program requires physical, biological, behavioral and social sciences to provide students with an education in foundational sciences, human function, health research, service and policy.

The department offers the Bachelor of Health Science in Health Science (BHS).

## Admission to the BHS in Health Sciences

The BHS in Health Sciences program does not require an application. Students may declare their major in the BHS program by indicating the program on the MU application (for new students), filling out a transfer of division form (for current MU students), or indication of their intention to declare a health science major to their academic advisor (for current SHP students). There is a 2.0 MU cumulative and term GPA requirement to declare a major in Health Sciences. The cumulative GPA is calculated on all MU and transfer coursework. Students must maintain the 2.0 GPA, term and cumulative, to remain in the Health Sciences program. Students who fail to achieve that GPA may stay in the program for two probationary semesters. If the 2.0 term or cumulative GPA is not achieved after two probationary semesters, students must transfer out of the Health Sciences program.

## Graduate

While MU does not offer graduate degrees specifically in health sciences, the University does offer post-baccalaureate opportunities in a number of related areas, both within the School of Health Professions, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

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### Department Level Requirements - Health Science

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Courses may be delivered using traditional or distance delivery methods. The Health Sciences degree program credits must include a minimum of 120 university-level credit hours including: General education requirements comprise a minimum of 42 credit hours; Health Sciences core course requirement comprise a minimum of 19 credit hours; Health Sciences approved elective courses comprise a minimum of 18 credit hours; Electives fulfilling the student's concentration area comprise the remaining 41 credit hours.

Students are required to file a graduation plan for the BHS degree by the time they have completed 90 university-level credit hours, including all MU and transfer credits. Students should meet with their academic advisor to discuss the graduation plan, and then file their plan prior to early registration for the fall, summer and spring semesters. Students who transfer from another institution or another school/college at MU with more than 60 hours must file their graduation plan within their first semester of coursework in SHP and at MU.

## Residency Requirement

There is a residency requirement for Health Sciences majors. Students must complete, at minimum, the 30 hours of coursework for the degree as declared Health Sciences majors in the School of Health Professions. Students must be in the Health Sciences major at the beginning of a semester to include the hours in the residency requirement. Residency requirement hours for students transferring into the major during the semester will begin the following semester.

## BHS in Health Science

### Major Program Requirements

- Students must maintain the 2.0 GPA, term and cumulative, to remain in the Health Sciences program. Students who fail to achieve a 2.0 GPA may stay in the program for two probationary semesters, and if they fail to earn a 2.0 term or cumulative GPA after the two probationary semesters, students must transfer out of the Health Sciences program.
- All required core and elective coursework for the BHS in Health Sciences program, including requirements outside the department, must be completed with a grade of C- or higher.
- Students must complete all university requirements, including general education (p. 18), and Department Level Requirements (p. 477), in addition the degree requirements below.
- Students may only repeat a core required course one time.

### Capstone Requirement

The BHS capstone is comprised of two courses: HLTH\_SCI 4975 and HLTH\_SCI 4985. HLTH\_SCI 4975 offers ways to complete the capstone experience through internships. The internship will be approved by the internship advisor and faculty internship coordinator. Students may find their own internship experience or work with the course instructor/ internship advisor to identify an appropriate placement given interests and goals.

Students may choose from:

- an internship at an agency, company, or corporation of their choice. For an internship to be approved as a capstone experience, it must help students solidify and explore areas of concentration. Internships must have prior approval from the Health Sciences Internship advisor;
- service learning project which allows a student to serve approximately 50 clock hours in an organization. This can be arranged with the Internship advisor or through the Office of Service Learning on campus, and
- an approved study abroad program

### Required Core Courses

#### Required Core Courses

HLTH_SCI 1000	Introduction to the Health Professions	2
HLTH_SCI 2100	Health Sciences Seminar	1
HLTH_SCI 3300	Public Health Principles and Practice	3
HLTH_SCI 3900	Introduction to The Research Process and Evidence Base	3
HLTH_SCI 4300	Health Care in the United States	3
or HLTH_SCI 4300H	Health Care in the United States - Honors	
HLTH_SCI 4975	Internship in Health Sciences	1-6
HLTH_SCI 4985	Healthcare Organization and Leadership	3
HLTH_SCI 4480	Clinical Ethics	3

#### General Education Requirements

MATH 1100	College Algebra	3-5
or MATH 1160	Precalculus Mathematics	
ENGLSH 1000	Exposition and Argumentation ( or equivalent)	

or ENGLSH 1000H Honors Exposition English equivalent

#### Biological, Physical, and Mathematical Sciences requirement (9 or more credits)

##### Biological Science

BIO\_SC 1010 & BIO\_SC 1020 General Principles and Concepts of Biology and General Biology Laboratory  
 or BIO\_SC 1500 Introduction to Biological Systems with Laboratory

##### Physical Science

##### Mathematics Science

STAT 1200 Introductory Statistical Reasoning  
 or STAT 1300 Elementary Statistics

Math Reasoning Proficiency Course Typically fulfilled by one of the following: 3

STAT 1200 Introductory Statistical Reasoning  
 STAT 1300 Elementary Statistics  
 CHEM 1320 College Chemistry I

PHYSCS 1210 College Physics I 4  
 PHYSCS 1220 College Physics II 4

#### Behavioral and Social Sciences (9 or more credits):

##### Behavioral Science

##### Social Science

HIST 1100 Survey of American History to 1865  
 HIST 1200 Survey of American History Since 1865  
 POL\_SC 1100 American Government

Or other approved course

#### Humanities and Fine Arts (9 or more credits required from 2 different areas)

12 or more credits of a single foreign language may be used to fulfill this requirement

#### Distribution of Content:

Students must have at least one 2000 level or above course in two of three areas:

1. Biological/Physical/Mathematical Science
2. Behavioral/Social Science
3. Humanities/Fine Arts

#### BHS Electives

Students must complete 18 hours of approved elective courses. At least 9 credit hours must be from 3000/4000 level courses. Students must complete course work in at least two out of these three thematic areas: Social/Behavioral; Medical/Biological; Administrative/Leadership.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
HLTH_SCI 1000	2	HIST 1100, 1200, or POL_SC 1100	3
PSYCH 1000	3	ENGLSH 1000	3
MATH 1100	3	Humanities course	3
Humanities Course *	3	CHEM 1320	4
BIO_SC 1010	3	Behavioral/Social Science Course	3
BIO_SC 1020	2		
CPD 3200	2		
	<b>18</b>		<b>16</b>
Second Year			
Fall	Credits	Spring	Credits
CHEM 1330 <sup>†</sup>	4	Humanities course	3
Humanities course	3	STAT 1200	3
HLTH_SCI 3300	3	PTH_AS 2201 <sup>#</sup>	3
CPD 2190	3	PTH_AS 2203 <sup>‡</sup>	2
		Elective	3
	<b>13</b>		<b>14</b>
Third Year			
Fall	Credits	Spring	Credits
MPP 3202	5	HLTH_SCI 4480	3
HLTH_SCI 4300	3	HLTH_SCI 3900 (Writing Intensive)	3
Writing Intensive Course	3	Elective Course <sup>^</sup>	3
Elective Course *	3	CPD 3200	2
HLTH_SCI 2100	1	Elective Course <sup>^</sup>	3
		Elective Course <sup>^</sup>	1
	<b>15</b>		<b>15</b>
Fourth Year			
Fall	Credits	Spring	Credits
HTH_PR 4250 <sup>#</sup>	3	PHYSICS 1220	4
PHYSICS 1210	4	HLTH_SCI 4985	3
HLTH_SCI 4975 <sup>*</sup>	3	Elective Course <sup>^</sup>	3
Elective Course *	3	Elective Course <sup>^</sup>	3
Elective Course *	3	Elective Course <sup>^</sup>	1
	<b>16</b>		<b>14</b>
Total Credits: 121			

\* Denotes elective coursework. These specific courses are not required, though the credit hours are required to teach the University requirement of 120 total hours.

<sup>^</sup> BIO\_SC 1500: Intro Biological Systems with Lab can be taken in lieu of BIO\_SC 1010 and BIO\_SC 1020.

<sup>#</sup> Denotes Health Sciences elective coursework. These specific courses will count towards the 18 hours required for completion of the Health Science Degree program.

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## Occupational Therapy

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Department of Occupational Therapy  
School of Health Professions  
801 Clark Hall  
Columbia, Missouri 65211  
(573) 882-3988

### Advising Contact

MUOT@health.missouri.edu

### Scholarship Information Contact

MUOT@health.missouri.edu

Occupational therapists are skilled health professionals who provide services to infants, children, adults and older persons experiencing physical, emotional or mental limitations in performing everyday activities. The department's philosophy supports a holistic model that emphasizes empowerment and the mind, body, spirit. The curriculum focuses on the value of occupation in relationship to health and wellness. The department's mission is to produce competent practitioners who can meet the challenges and changes occurring in institutions, community-based programs and educational settings in both urban and rural areas of Missouri.

Occupational therapists are employed in public and private schools, hospitals, rehabilitation centers, mental health facilities, nursing homes, home health agencies, community health programs and industry. As independent health practitioners, they are also involved in business, working with disability claims, in work-hardening programs and wellness/health promotion, or as proprietors of their own therapy services. Occupational therapists also work as educators, administrators, consultants and researchers.

The department offers a Bachelor of Health Science in Occupational Therapy (BHS) followed by the entry level master degree (MOT). To become a registered therapist the master degree is required.

Department accreditation is granted by the Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association, 4720 Montgomery Lane, Bethesda, MD 20814-3425, (301) 652-2682.

## Faculty

**Assistant Professor** K. Hebert\*\*, D. Smith\*\*, A. Bonsall\*\*

**Associate Clinical Professor** G. Krug, L. Lowery

**Assistant Teaching Professor** C. Gateley, S. Chakraborty\*\*

**Clinical Instructor** D. Weston, B. Stevenson

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 480)
- BHS in Occupational Therapy (p. 480)

## Graduate

Department of Occupational Therapy  
School of Health Professions  
801 Clark Hall, Columbia, MO 65211  
573-882-3988; FAX 573-884-2610  
<http://shp.missouri.edu/ot/>

- MOT in Occupational Therapy (p. 482)

The School of Health Professions offers an entry level master's degree in occupational therapy. Students apply to the Department of Occupational Therapy as an undergraduate, receive a Bachelor of Health Sciences in Occupational Therapy (BHS-OT) and continue on to graduate level courses. Student with completed bachelor degree at time of application to the program may opt to take all program courses at graduate level. Graduate courses are only offered to students enrolled in the program. The degree program is approved to meet accreditation requirements requiring a graduate degree. Contact the Department of Occupational Therapy for more information regarding the degree.

## Accreditation & Certification

The Department of Occupational Therapy is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association, 4720 Montgomery Lane, Bethesda, MD, 20814-3425, (301) 652-2682.

Graduates are eligible to sit for the national certification examination administered by the National Board for Certification in Occupational Therapy (NBCOT), Inc. 12 South Summit Ave., Suite 100, Gaithersburg, MD 20877-4150, telephone (301) 990-7979; Fax (301) 869-8492.

## Financial Aid from the Program

Check the School of Health Professions website at <http://shp.missouri.edu> for scholarship information.

## Undergraduate

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## Department Level Requirements - Occupational Therapy

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There are no requirements at the department level for this degree. Please see the BHS in Occupational Therapy (p. 480) page for degree requirements.

## BHS in Occupational Therapy

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## Major Program Requirements

The professional degree program requires three years of course work after completion of all prerequisites and university general education requirements. Six months of field experiences in affiliated clinical and community-based sites, must be completed within 24 months after required didactic courses.

Students with a bachelor's degree must complete the prerequisite courses and meet the university and OT admission requirements.

The following are MU courses. Students transferring from other institutions should seek advisement from the school and OT advisors and select appropriate prerequisite courses for admission. Medical



terminology proficiency and 30 hours of observation is required. In addition to university, college and degree requirements, students must complete the following:

**Major core requirements**

Prerequisites to the major		
COMMUN 1200	Public Speaking	3
Select one of the following:		5
BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory	
BIO_SC 1500	Introduction to Biological Systems with Laboratory	
PSYCH 2510	Survey of Abnormal Psychology	3
PHYSICS 1210	College Physics I	4
H_D_FS 2400	Principles of Human Development	4
MPP 3202	Elements of Physiology	5
SOCIOL 1000	Introduction to Sociology	3
or ANTHRO 1000	General Anthropology	
PSYCH 1000	General Psychology	3
ESC_PS 4170	Introduction to Applied Statistics	3
or STAT 1300	Elementary Statistics	
OC_THR 1000	Introduction to Occupational Therapy	1-2
or HLTH_SCI 1000	Introduction to the Health Professions	

**Departmental course requirements**

PTH_AS 4222	Gross Human Anatomy (The Health Professions) (The Health Professions)	7
OC_THR 4060	Professional Issues	1
OC_THR 4240	Applied Neurophysiology for Allied Health Students	3
OC_THR 4390	Lifespan Assessment	3
OC_THR 4220	Clinical Kinesiology	3
OC_THR 4520	Fundamentals of Occupational Therapy	4
OC_THR 4310	Foundations of Occupational Therapy	4
CPD 3200	Essentials of Pathology	2
OC_THR 4270	Clinical Pathophysiology	3
OC_THR 4622	Fieldwork I Older Adults	1
OC_THR 4650	Lifespan Interventions	4
OC_THR 4770	Community-Based Practice	3
OC_THR 4970	Research Methods	3
OC_THR 4740	Neurophysiology II - Seminar: Advanced Concepts in Neuroscience	1
OC_THR 4450	Pediatric Practice	4
OC_THR 4350	Rehabilitation Practice	4
Total Credits		84-85

**Professional Certification**

Upon successful completion of all courses, including field work experiences, students are eligible to sit for the examination of the National Board for Certification in Occupational Therapy, 800 South Fredrick, Suite 200, Gaithersburg, MD 20977-4150, (301) 990-7979. Successful completion of the exam is required by state regulatory agencies before entering into the profession.

**Semester Plan**

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
HLTH_SCI 1000*	2	HIST 1100, 1200, or POL_SC 1100	3		
OC_THR 1000*	1	ENGLSH 1000	3		
PSYCH 1000	3	COMMUN 1200	3		
MATH 1100	3	SOCIOL 1000, RU_SOC 1000, or ANTHRO 1000	3		
BIO_SC 1500 or 1010 and 1020	5	Elective course*	3		
		14	15		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
H_D_FS 2400 (Writing Intensive)	4	PSYCH 2510	3	Professional Component Begins	
ESC_PS 4170, STAT 1300, or STAT 1200	3	Humanities course	3	PTH_AS 4222	7
Humanities	3	PHYSICS 1210	4	OC_THR 4060	1
MPP 3202 or 3333 and 3337	5	Elective*	2		
		15	12		8
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
CPD 3200	2	OC_THR 4270	3	OC_THR 4670	2
OC_THR 4520	4	OC_THR 4740	1	OC_THR 4620	2
OC_THR 4220	3	OC_THR 4390	3	OC_THR 4622	1
OC_THR 4240	3	OC_THR 4420	2	OC_THR 4770	3
OC_THR 4310	4	OC_THR 4650	4		
		OC_THR 4920	2		
		OC_THR 4422	1		
		16	16		8

Fourth Year			
Fall	Credits	Spring	Credits
OC_THR 4750	2	OC_THR 7000	2
OC_THR 4350	4	OC_THR 7005	1
OC_THR 4450	4	OC_THR 8003	4
OC_THR 4970	3	Mental Health Fieldwork I	1
		Advanced Adult Strategies	3
		Advanced Pediatric Strategies	1
		Independent Study Pediatric Clinic	1
		Independent Study Adult Clinic	1
	13		14
Fifth Year			
Fall	Credits	Spring	Credits
OC_THR 7920	2	OC_THR 7983	6
OC_THR 8002	3	OC_THR 7993	6
OC_THR 8087	4		
OC_THR 8090	2		
OC_THR 8095	1		
OC_THR 8999	1		
	13		12
Total Credits: 156			

\* Denotes elective coursework. These specific courses are not required, though the credit hours are required to reach the minimum amount of credit hours (59) needed to be eligible for the OT Professional Program.

## Graduate

### MOT in Occupational Therapy

Leanna Garrison, Department Manager  
 405 Lewis Hall; Columbia, MO 65211  
 573-884-2113

#### Admission Criteria

Application Deadline for Summer entrance: December 31

- Minimum MAT score: none set

- Undergraduate GPA: 3.0 or higher (4.0=A)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Completion of all undergraduate/OT prerequisites
- 30 hours of occupational therapy observation
- Completion of all required application materials
- Acceptance to program

#### Required Application Materials

To the Graduate School:

- All required Graduate School documents

Required Application Materials to the Program (Occupational Therapy):

- Go to <http://shp.missouri.edu/ot/> for departmental application forms (available Oct. 1-Dec. 31)
- Departmental application
- Observation Forms
- Volunteer Forms
- 3 Completed Reference forms
- Personal Statement
- Interview

#### Requirements for Masters Degree in Occupational Therapy

The Department of Occupational Therapy offers the Master of Occupational Therapy degree as the terminal degree of the program. All students must complete the prerequisite courses and meet the admission requirements to apply. The occupational therapy graduate courses include a minimum of 34 credits beyond the bachelor's degree in OT. The masters degree is required to become certified and licensed to practice as an Occupational Therapist.

## Physical Therapy

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K. Gibson, Chair  
Department of Physical Therapy  
School of Health Professions  
106 Lewis Hall  
(573) 882-7103  
Fax: (573) 884-8369  
mushppt@missouri.edu  
<http://shp.missouri.edu/pt/>

Physical Therapy involves the evaluation and treatment of physical disability and pain that may result from injury, disease or developmental disability. Prevention of disability and public education are also roles of the physical therapist. Physical therapists use tests and measurements to assess body system dysfunction and determine diagnosis and treatment. Daily living skills, including work, are also addressed.

The University of Missouri offers a Doctor of Physical Therapy degree. No master's degree or terminal undergraduate degree in Physical Therapy are available.

### Admissions

#### Doctor of Physical Therapy Program, Regular Admissions

Most students admitted to the Doctor of Physical Therapy program will have a baccalaureate degree. Students who are interested in pursuing application to the Doctor of Physical Therapy program are encouraged to work on an undergraduate degree that will allow them to fulfill application requirements.

#### Doctor of Physical Therapy Program, Early Admissions

Admission to the Doctor of Physical Therapy program may be available to a small group of students who have completed at least 90 credit hours, completed at least six full-time semesters of residential course work, all MU general education requirements and have shown excellent academic progress. Students who gain early admission to the Doctor of Physical Therapy program will be awarded the Bachelor of Health Science in pre-professional physical therapy upon completing one year of coursework in the physical therapy program.

Information regarding the admissions procedures and curriculum for the Doctor of Physical Therapy (p. 483) program can be found on the graduate tab.

### Faculty

**Professor** M. Brown\*\*, M. A. Minor\*\*

**Associate Professor** E. A. Dannecker\*\*, S. P. Sayers\*\*

**Teaching Associate Professor** C. C. Abbott\*, K. Gibson\*, M. S. Hargrove\*, K. L. Wingert

**Teaching Assistant Professor** J. Bridges\*, T. Briedwell\*, J. Krug\*, J. B. Mann, D. E. Martin, E. Prost\*

**Instructor** C. A. Blow\*, A. C. Connell, N. J. Dietz, S. E. Lindaman, J. J. McElroy

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in physical therapy, the University does offer baccalaureate opportunities in a number of related areas, both within the School of Health Professions, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

Physical Therapy Doctoral Degree Program  
School of Health Professions  
106 Lewis Hall  
573-882-7103  
573-884-8369 (fax)  
mushppt@missouri.edu  
<http://shp.missouri.edu/pt/>

- DPT in Physical Therapy (p. 483)

Starting in 2007, students who enter the MU Physical Therapy program will complete a Doctor of Physical Therapy (DPT) degree program.

### Careers

The DPT degree is an entry-level clinical degree that prepares the student to enter the field of physical therapy as a general practitioner with a background in musculoskeletal, neuromuscular, cardiovascular/pulmonary and integumentary systems.

### Financial Aid from the Program

Students may apply for scholarships and assistantships. Check the program website or ask the program contact for availability and details.

### Graduate

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#### DPT in Physical Therapy

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Admission Contact Information  
Beverly Denbigh  
School of Health Professions  
106 Lewis Hall  
573-882-7103  
573-884-8369 (fax)

#### Application and Admission Information

Applicants who will have an undergraduate degree prior to entering the program will apply to the Graduate School online admission process in addition to the Departmental Application. Graduate School applications must be submitted by January 10th.

Departmental applications are required and are due in the PT office by January 24th.

Students who are admitted without a degree will receive a bachelor's degree at completion of the first year.

All students are strongly encouraged to contact the department office for advisement and planning well in advance of application.

## Admission Criteria

Fall deadline: N/A

Summer deadline: January 10

- Minimum TOEFL scores:

Internet-based test (iBT) Area	iBT Score	Paper-based test (PBT) Area	PBT Score
Reading	20	Listening	55
Listening	21	Structure/Written	55
Speaking	26	Reading	55
Writing	17		
TOTAL	100	TOTAL	600

- Minimum GPA: 3.0

## Prerequisites for the Doctoral Degree

**Note:** The DPT program accepts students to begin the professional program only for summer terms, which begin in June.

Admission to the DPT program is available through regular admission (applicants will have a bachelor's degree prior to beginning the professional program) or through an early admission option that allows students to enter the professional program with 90 credit hours.

All applicants must have at least a 3.0 GPA in the core required courses and as a cumulative GPA in the last 60 credit hours.

On-campus interviews are required for admission to the professional program.

Students who enter without a bachelor's degree must have satisfied the MU general education and graduation requirements and taken two Writing Intensive courses at MU. These applicants must possess a 3.5 GPA.

Applicants are notified of the selection committee's decision by March.

All students are strongly encouraged to contact the School of Health Professions Student Affairs Office for advisement and planning well in advance of application.

Admission to the program is selective.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Program <http://shp.missouri.edu/pt/>

- Departmental application
- 2 letters of recommendation (included in the application packet)
- Curriculum Vitae (resume) as specified by the application guidelines
- Official transcripts (year of application, fall grades must be recorded on transcript)
- GRE score report
- Departmental application fee

## Plan of Study

The professional program is offered in sequential blocks and requires full-time enrollment for three academic years and three summer sessions,

beginning in the summer session following acceptance. The curriculum contains foundational and clinical sciences combining traditional lectures and course work, laboratory sessions, problem-based learning classes and clinical education. More than 200 clinical sites in Missouri and beyond are available for supervised clinical education.

A graduate must pass the National Physical Therapy Examination to receive a license to practice in the United States. The program is accredited by the Commission on Accreditation in Physical Therapy (CAPTE). Graduates are eligible for licensure anywhere in the United States.

## Degree Requirements

All students admitted must maintain a 3.0 grade point average with no grade below C (2.0) in courses required for the degree. Failure to achieve a semester or professional cumulative grade point average of 3.0 in required courses will result in probation or dismissal from the program. Students are expected to maintain full-time enrollment in the curriculum and complete the degree requirements as outlined in the course of study. Any exception must be approved by departmental faculty. Students must demonstrate the personal behaviors and characteristics associated with optimal patient welfare and professional trust.

## Radiologic Sciences

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There are two active emphasis areas in the radiologic sciences: Radiography and Nuclear Medicine. Students planning to complete one of these emphasis areas should contact the program director to determine eligibility for admission.

### Emphasis in Radiography

#### Radiography

School of Health Professions

607 Lewis Hall

(573) 884-2623

Director: Patricia Tew

Radiographers are highly skilled health professionals who work closely with physicians and specialize in the use of x-rays. They provide patient services using a variety of imaging modalities. In addition to conventional x-ray procedures, the radiographer also works with computerized axial tomography (CT), magnetic resonance imaging (MRI), cardiovascular-interventional technology, mammography, bone densitometry, and quality management.

### More About Radiography

Established in 1960, the Radiography Program is the only baccalaureate level program at a public institution of higher education in Missouri.

This discipline provides preparation for leaders in the field by offering a Bachelor of Health Science degree. Graduates have demonstrated their superior achievement through their performance on national certifying examinations with a 100% overall pass rate. After graduating from the program, students may choose to do an additional clinical externship in computerized tomography or magnetic resonance imaging, which will lead to a certificate of completion and eligibility to take the national certifying examination in that area.

### Emphasis in Nuclear Medicine

#### Nuclear Medicine

School of Health Professions

605 Lewis Hall

(573) 884-7843

Director: Glen Heggie

The nuclear medicine technologist is concerned with the use of radioactivity for patient diagnosis, monitoring of treatment and in some cases the treatment itself. The nuclear medicine technologist uses radioactive compounds to perform body function studies, produce images of internal organs and analyze biological specimens.

### More About Nuclear Medicine

Nuclear Medicine uses extremely small amounts of radioactive compounds in order to image and assess the function and state of health of many of the body's internal organs, and to treat some forms of cancer. It is a multidisciplinary field dependent upon contributions from Physics, Chemistry and Medicine. This highly sophisticated discipline is at the forefront of discovering and understanding the complex physiologic processes of our bodies. This discipline is of enormous importance to medical specialties such as Cardiology (heart), Neurology (nervous system), Oncology (cancer), Orthopedics (bone), Endocrinology (hormone system), Hematology (blood), Nephrology (kidney), and Pulmonology (lung).

## Mission Statement

The primary mission of the radiography program is to prepare highly competent, registry eligible professionals in the medical imaging sciences. Our program and curriculum are designed to provide an educational foundation for the advancement into leadership and managerial positions within medical imaging, as well as providing an environment where scholarly activity, professional development, and service are expectations. Our curriculum enables successful graduates to readily interact with a variety of health care and science related fields.

## Faculty

**Clinical Professor** G. D. Heggie\*

**Clinical Associate Professor** C. M. Allen

**Clinical Assistant Professor** M. Feldman, M. C. Sebacher, P. A. Tew

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 485)
- BHS in Radiologic Sciences (p. 486)
  - with emphasis in Radiography (p. 487)
  - with emphasis in Nuclear Medicine Technician (p. 486)

The Department of Cardiopulmonary and Diagnostic Sciences offers the Bachelor of Health Science (BHS) with majors in Clinical Laboratory Science (with an emphasis area of Medical Technology), Diagnostic Medical Ultrasound, Respiratory Therapy, and Radiological Sciences. Students majoring in Radiological Sciences must complete emphasis areas in Radiography or Nuclear Medicine Technology.

## Graduate

While MU does not offer graduate degrees specifically in radiologic sciences, the University does offer post-baccalaureate opportunities in a number of related areas, both within the School of Health Professions, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

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## Department Level Requirements - Radiologic Sciences

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### Instructional Plan

Radiography program faculty advise interested students throughout their college career. During the first two years, students enroll in general education courses (<http://missouri.dev9.leepfrog.com/academicdegreerequirements/generaleducationrequirements>) and complete required prerequisite courses. Students apply to the

radiography program during spring semester of their sophomore year (by February 1st). Upon acceptance into the program, students begin professional radiography courses summer semester of their Junior year. This professional phase of the program runs for 24 consecutive months.

In addition to general requirements and courses pertinent to radiography, students in the program will take interdisciplinary courses in cardiology, research, healthcare organization and management, radiation safety, and radiation biology. They will also have an opportunity to experience problem based learning (PBL) cases.

While in the program, students will receive clinical instruction at several clinical affiliates such as University of Missouri Hospital Center, Women's & Children's Hospital, Harry S Truman Veteran's Administration Hospital and Boone Hospital Center. Our clinical affiliates provide students with a broad base of learning experiences. Other clinical rotations may include radiation therapy, nuclear medicine, diagnostic medical ultrasound, CT, MRI, veterinary medicine, mammography and trauma/emergency imaging.

## Essential Requirements

Before beginning the professional phase of the School of Health Professions' Radiography Program, we want you to have certain information available to you. We encourage you to read through the Essential Requirements ([http://shp.missouri.edu/rs/download/Essential\\_Requirements.pdf](http://shp.missouri.edu/rs/download/Essential_Requirements.pdf)). The Radiography Program is a serious commitment—for you and for us. More than anything else, however, it is a serious commitment to patients, including those you will see and work with as students and, most importantly, those for whom you will be responsible later in your careers.

## BHS in Radiologic Sciences

### Major Program Requirements

There are two active emphasis areas in the radiologic sciences: Radiography and Nuclear Medicine. Students planning to complete one of these emphasis areas should contact the program director to determine eligibility for admission. All degree requirements are listed that the emphasis level.

### Semester Plan

Refer to the Semester Plan for the emphasis areas.

## BHS in Radiologic Sciences with Emphasis in Nuclear Medicine Technician

### Major Program Requirements

The nuclear medicine technologist is concerned with the use of radioactivity for patient diagnosis, monitoring of treatment and in some cases the treatment itself. The nuclear medicine technologist uses radioactive compounds to perform body function studies, produce images of internal organs and analyze biological specimens.

The curriculum incorporates the fundamentals needed for specialization as a nuclear medicine professional. Accreditation of the program is

granted by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology.

The following are MU courses. Students transferring from other institutions should contact the program director to select appropriate prerequisite courses for admission. Students must complete these courses in addition to major, degree and University requirements (p. 17), including University general education (p. 18) requirements.

## Emphasis Core Requirements

### Prerequisites to the nuclear medicine emphasis

BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory (or BIO_SC 1500)	5
CHEM 1320	College Chemistry I	4
CHEM 2100	Organic Chemistry I	3
CHEM 4600	Introduction to Radiochemistry with Lab	3
ENGLSH 1000	Exposition and Argumentation	3
MATH 1100	College Algebra	3
MATH 1400	Calculus for Social and Life Sciences I	3
PSYCH 1000	General Psychology	3
PHYSICS 1210	College Physics I	4
PTH_AS 2201 & PTH_AS 2203	Human Anatomy Lecture and Human Anatomy Laboratory	5
NUCMED 1000	Orientation to Nuclear Medicine	1
RADIOL 4328	Introductory Radiation Biology	3
RA_SCI 4303	Radiation Safety	3
MPP 3202	Elements of Physiology	5
STAT 1200 or STAT 1300	Introductory Statistical Reasoning Elementary Statistics	3
or ESC_PS 4170	Introduction to Applied Statistics	
SOCIOL 1000	Introduction to Sociology	3
or ANTHRO 1000	General Anthropology	
PHYSICS 1220	College Physics II	4
CPD 2190	Medical Terminology	3
CPD 4480	Clinical Ethics	3
CPD 4955	Introduction to Research	3

### Core requirements for the nuclear medicine emphasis

NUCMED 4329	Radiopharmaceuticals in Nuclear Medicine	3
NUCMED 3263	Morphological Correlations in Nuclear Medicine I	3
NUCMED 3256	Clinical Nuclear Medicine I	2
NUCMED 3255	Orientation to Clinical Practice	2
NUCMED 4940	Clinical In Vivo I	6
NUCMED 4268	Clinical Nuclear Medicine II	3
NUCMED 4327	Nuclear Medicine Instrumentation	3
NUCMED 4941	Clinical In Vivo II	7
NUCMED 4232	Clinical In Vitro	3
NUCMED 4299	Morphological Correlations in Nuclear Medicine II	3
NUCMED 4269	Clinical Nuclear Medicine III	1
NUCMED 4330	PET in Nuclear Medicine	3
RA_SCI 4110	Sectional Anatomy	3
RA_SCI 4150	Computed Tomography: Physics and Procedures	5
CPD 3460	Cardiovascular and Pulmonary Diagnostic Applications I	3

Students are strongly encouraged to take the following course:		
CPD 4440	Organization and Administration	3
Total Credits		120

## Professional Certification

Upon completion of the program, students are eligible to take the national certifying examinations given by the Nuclear Medicine Technology Certification Board. Students may also pursue credentials offered through the American Registry of Radiologic Technologists.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	Credits	Spring	Credits		
MATH 1100	3	NUCMED 1000	1		
PSYCH 1000	3	ENGLISH 1000	3		
HIST 1100, 1200, or POL_SC 1100	3	CHEM 1320	4		
BIO_SC 1010 & BIO_SC 1020 (or BIO_SC 1500)	5	COMMUN 1200	3		
		STAT 1200 or ESC_PS 4170	3		
	14		14		
Second Year					
Fall	Credits	Spring	Credits		
PTH_AS 2201 & PTH_AS 2203	5	MPP 3202	5		
PHYSICS 1210	4	PHYSICS 1220	4		
CPD 2190	3	Behavioral/ Social Science (level 2000+)	3		
CPD 4955 (Writing Intensive)	3	Humanities 2000+ Level Course	3		
	15		15		
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
NUCMED 3255	2	CHEM 2100	3	NUCMED 4232	3
NUCMED 3263	3	CHEM 4600	3	CPD 4480	3
NUCMED 4329	3	NUCMED 3256	2		
RA_SCI 4303	3	NUCMED 4299	3		

RADIOL 4328	3	Humanities	3		
	14		14	6	
Fourth Year					
Fall	Credits	Spring	Credits		
NUCMED 4268	3	NUCMED 4269	1		
NUCMED 4327	3	NUCMED 4330	3		
NUCMED 4940	6	NUCMED 4941	7		
RA_SCI 4110	3	RA_SCI 4150	5		
	15		16		
Total Credits: 123					

## BHS in Radiologic Sciences with Emphasis in Radiography

### Major Program Requirements

Radiographers are highly skilled health professionals who work closely with physicians specializing in the use of x-rays. They provide patient services using a variety of imaging modalities such as general x-ray, computed tomography, magnetic resonance imaging, mammography, interventional radiography, and bone densitometry. The radiographer must apply the principles of radiation protection, must be competent in the use and maintenance of delicate equipment and must have the ability to deal with patients and medical professionals.

Accreditation of the program is granted by:

The Joint Review Committee on Education in Radiologic Technology  
 20 North Wacker Drive, Suite 2850  
 Chicago, Illinois 60606-3182  
 312-704-5300  
 mail@jrcert.org

Students transferring from other institutions should contact the program director to select appropriate prerequisite courses for admission. Students must complete these courses in addition to major, degree and University requirements (p. 17), including University general education requirements (p. 18).

### Emphasis core requirements

#### Prerequisites for radiography emphasis

HLTH_SCI 1000	Introduction to the Health Professions	2
MATH 1100	College Algebra	3
RU_SOC 1000	Rural Sociology	3
or SOCIOL 1000	Introduction to Sociology	
BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory	5
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
PSYCH 1000	General Psychology	3
ENGLISH 1000	Exposition and Argumentation	3
HIST 1100	Survey of American History to 1865	3
or HIST 1200	Survey of American History Since 1865	
or POL_SC 1100	American Government	
COMMUN 1200	Public Speaking	3

PTH_AS 2201	Human Anatomy Lecture	5
& PTH_AS 2203	and Human Anatomy Laboratory	
MPP 3202	Elements of Physiology	5
CPD 2190	Medical Terminology	3
ESC_PS 4170	Introduction to Applied Statistics	3
Humanities		6

**Core requirements for radiography emphasis**

RA_SCI 3120	Fundamentals of Radiography	3
RA_SCI 3110	Radiography Procedures I	2
RA_SCI 3130	Basic Radiographic Skills	2
RA_SCI 3140	Principles in Radiographic Exposure I	3
RA_SCI 3150	Radiologic Pharmacology	3
RA_SCI 3160	Radiologic Physics	3
RA_SCI 3170	Imaging Modalities	2
RA_SCI 3180	Radiography Procedures II	2
RA_SCI 3190	Radiography Procedures III	3
RA_SCI 3941	Clinical Education I	3
RA_SCI 3942	Clinical Education II	3
CPD 3460	Cardiovascular and Pulmonary Diagnostic Applications I	3
RA_SCI 4110	Sectional Anatomy	3
RA_SCI 4943	Clinical Education III	3
CPD 4460	Cardiovascular and Pulmonary Diagnostic Applications II	3
RA_SCI 4944	Clinical Education IV	3
RA_SCI 4303	Radiation Safety	3
RADIOL 4328	Introductory Radiation Biology	3
CPD 4955	Introduction to Research	3
CPD 4440	Organization and Administration	3
RA_SCI 4947	Radiography Overview	3
RA_SCI 4945	Clinical Education V	3
RA_SCI 4980	Imaging Pathology	3
RA_SCI 4140	Magnetic Resonance Imaging: Physics and Procedures	5
or RA_SCI 4150	Computed Tomography: Physics and Procedures	

Total Credits 117

**Professional Certification**

Upon completion of the program, students are eligible to sit for the national certifying exam given by the American Registry of Radiologic Technologists.

**Semester Plan**

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year				
Fall	Credits	Spring	Credits	
MATH 1100	3	ENGLISH 1000	3	

BIO_SC 1010 & BIO_SC 1020 (or BIO_SC 1500)	5	CHEM 1320	4		
HLTH_SCI 1000	2	COMMUN 1200	3		
Elective	3	PSYCH 1000	3		
		Humanities	3		
	13		16		
Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
PTH_AS 2201 & PTH_AS 2203	5	MPP 3202	5	RA_SCI 3110	2
CPD 2190	3	ESC_PS 4170	3	RA_SCI 3120	3
HIST 1100 or POL_SC 1100	3	Elective	3	RA_SCI 3130	2
Humanities	3	Behav / Social Science	3		
	14		14		7
Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
RA_SCI 3140	3	RA_SCI 3170	2	RA_SCI 4943	3
RA_SCI 3150	3	RA_SCI 3190	3	CPD 4460	3
RA_SCI 3160	3	RA_SCI 3942	3		
RA_SCI 3180	2	RA_SCI 4110	3		
RA_SCI 3941	3	CPD 3460	3		
	14		14		6
Fourth Year					
Fall	Credits	Spring	Credits		
RA_SCI 4303	3	RA_SCI 4945	3		
RA_SCI 4944	3	RA_SCI 4947	3		
CPD 4440	3	RA_SCI 4980	3		
CPD 4955	3	RA_SCI 4140 or 4150 <sup>+</sup>	5		
RADIOL 4328	3				
	15		14		
Total Credits: 127					

+ Course is taught solely on the internet.



## Respiratory Therapy

### Respiratory Therapy

School of Health Professions  
614 Lewis Hall  
(573) 882-9722  
Program Director: Monica Schibig

The University of Missouri Respiratory Therapy Program was established in 1967. The program is credited to be among the country's first baccalaureate degree programs in Respiratory Therapy. The University of Missouri's Respiratory Therapy program prepares graduates for the Advanced Practitioner level, Registered Respiratory Therapist (RRT) and students graduate with a Bachelor of Health Science in Respiratory Therapy.

The Mission of the University of Missouri Respiratory Therapy Program is to coordinate superior classroom, laboratory, and clinical experiences to prepare advanced Respiratory Care Practitioners, develop learners who will effectively engage in professional leadership roles, and provide an environment where research and service are expectations.

### Faculty

**Clinical Professor** G. D. Heggie\*  
**Clinical Associate Professor** M. A. Schibig, K.S. Moss\*  
**Clinical Assistant Professor** L. M. Lair  
**Clinical Instructor** J. L. Keely, S. W. Parker

- \* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
- \*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 489)
- BHS in Respiratory Therapy (p. 489)

The Department of Cardiopulmonary and Diagnostic Sciences offers the Bachelor of Health Science (BHS) with majors in Clinical Laboratory Science (with an emphasis area of Medical Technology), Diagnostic Medical Ultrasound, Respiratory Therapy, and Radiological Sciences. Students majoring in Radiological Sciences must complete emphasis areas in Radiography or Nuclear Medicine Technology.

### Graduate

While MU does not offer graduate degrees specifically in respiratory therapy, the University does offer post-baccalaureate opportunities in a number of related areas, both within the School of Health Professions, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Undergraduate

## Department Level Requirements - Respiratory Therapy

Students transferring from other institutions should contact the program director to select appropriate courses for admission. Students must complete the major program requirements (p. 489) in addition to degree and University requirements (p. 17), which include University general education (p. 18) requirements.

## BHS in Respiratory Therapy

### Major Program Requirements

Respiratory care is a diverse, growing, health profession with extensive patient contact, often with the critically ill. Respiratory therapists administer prescribed respiratory care and life support to patients with deficiencies and abnormalities of the cardiopulmonary system. They work in many settings requiring a considerable degree of independent clinical judgment under the direct or indirect supervision of a physician.

The two-year, professional phase of the program begins the summer semester of the junior year. Students complete lecture and laboratory courses designed to develop knowledge and skills necessary for application to the clinical settings. Required courses in management, research, respiratory physiology and pharmacology, pathology and cardiology are integrated with the respiratory therapy curriculum. The final semester of the program consists entirely of clinical externships and online coursework. Students may select affiliated hospitals outside the Columbia area for this clinical experience or remain on campus at MU Health Care. The MU RT program has a satellite campus at Mercy Hospital-St. Louis for those students living in the St. Louis area.

Accreditation of the program is granted by the Committee on Accreditation for Respiratory Care (CoARC).

The following are MU courses. Students transferring from other institutions should contact the program director to select appropriate courses for admission. Students must complete the courses listed below in addition to degree and University requirements, which include University general education requirements.

#### Major core requirements

Prerequisites		
BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory (or BIO_SC 1500)	5
ENGLSH 1000	Exposition and Argumentation	3
CHEM 1320	College Chemistry I	4
ESC_PS 4170	Introduction to Applied Statistics	3
HIST 1100 or HIST 1200 or POL_SC 1100	Survey of American History to 1865 Survey of American History Since 1865 American Government	3
MATH 1100	College Algebra	3
CPD 2190	Medical Terminology	3
MICROB 3200 or MICROB 2800	Medical Microbiology and Immunology Microbiology for Nursing and Health Professions	4
MPP 3202	Elements of Physiology	5
PHYSCS 1210	College Physics I	4

PTH_AS 2201	Human Anatomy Lecture	5
& PTH_AS 2203	and Human Anatomy Laboratory	
RS_THR 1000	Introduction to Respiratory Therapy	1
SOCIOL 1000	Introduction to Sociology	3
or ANTHRO 1000	General Anthropology	

**Core requirements**

CPD 3200	Essentials of Pathology	2
CPD 3460	Cardiovascular and Pulmonary Diagnostic Applications I	3
CPD 4440	Organization and Administration	3
CPD 4460	Cardiovascular and Pulmonary Diagnostic Applications II	3
CPD 4500	Bioterrorism in Healthcare	1
CPD 4955	Introduction to Research	3
RS_THR 3000	Fundamentals of Respiratory Care	1
RS_THR 3220	Equipment and Techniques	5
RS_THR 3290	Cardiopulmonary Pharmacology	2
RS_THR 3420	Principles of Mechanical Ventilation	3
RS_THR 3440	Mechanical Ventilation Lab	3
RS_THR 3941	Clinical Practice I	2
RS_THR 3942	Clinical Practice II	4
RS_THR 3943	Clinical Practice III	2
RS_THR 4020	Perinatal/Neonatal Respiratory Care	3
RS_THR 4040	Respiratory Pathophysiology	5
RS_THR 4220	Community and Patient Education I	1
RS_THR 4240	Pulmonary Rehabilitation	3
RS_THR 4420	Pediatric Respiratory Care	3
RS_THR 4460	Evidence-Based Medicine in Respiratory Care	3
RS_THR 4620	Pulmonary Function Technologies	1
RS_THR 4940	Clinical Practice IV	5
RS_THR 4973	Clinical Practice V	4
RS_THR 4983	Clinical Practice VI	5
RS_THR 4993	Clinical Practice VII	5

Total Credits 121

**Professional Certification**

After graduation, students are eligible to take the Entry Level and Advanced Level Examinations given by the National Board for Respiratory Care. Application for admission due February 1 of the sophomore year.

**Semester Plan**

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year				
Fall	Credits	Spring	Credits	
MATH 1100	3	HLTH_SCI 1000	2	
PSYCH 1000	3	CHEM 1320	4	

HIST 1100, 1200, or POL_SC 1100	3	ENGLISH 1000	3	
BIO_SC 1010 & BIO_SC 1020	5	ESC_PS 4170 or STAT 1200	3	
Humanities	3	COMMUN 1200	3	
	17		15	

Second Year					
Fall	Credits	Spring	Credits	Summer	Credits
CPD 2190	3	MPP 3202	5	RS_THR 3000 (online)	1
RS_THR 1000	1	MICROB 3200	4		
PHYSICS 1210	4	SOCIOL 1000	1-3		
PTH_AS 2201 & PTH_AS 2203	5	Humanities Course (level 2000 or higher)	3		
Humanities	3				
	16		13-15		1

Third Year					
Fall	Credits	Spring	Credits	Summer	Credits
CPD 3200	2	CPD 3460	3	CPD 4460	3
RS_THR 3220	5	RS_THR 3420	3	RS_THR 3943	2
RS_THR 3290	2	RS_THR 3440	3	RS_THR 4220	1
RS_THR 3941	2	RS_THR 3942	4	RS_THR 4240	3
RS_THR 4040	5	RS_THR 4020	3		
	16		16		9

Fourth Year					
Fall	Credits	Spring	Credits		
RS_THR 4420	3	RS_THR 4460	3		
RS_THR 4620	1	RS_THR 4920	1		
RS_THR 4940	5	RS_THR 4973	4		
CPD 4440	3	RS_THR 4983	5		
CPD 4500	1	RS_THR 4993	5		
CPD 4955	3				
	16		18		

Total Credits: 137-139

## College of Human Environmental Sciences

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### Administration

Stephen R. Jorgensen, Dean  
Bea Smith, Dean Emeritus  
Jo Britt-Rankin, Associate Dean for Human Environmental Sciences Outreach and Extension  
James (Sandy) Rikoon, Associate Dean for Research and Graduate Studies  
Victoria Shahan, Student Services Director

### Academic Advising Contact

Victoria Shahan  
106 Gwynn Hall  
(573) 882-6424  
HESStudentServices@missouri.edu  
<http://hes.missouri.edu>

### Scholarship Information Contact

Nancy Schultz  
121 Gwynn Hall  
(573) 882-5142  
umchesdevelopment@missouri.edu

The College of Human Environmental Sciences addresses human needs and enhances individual and family life in a diverse and global society by conducting advanced research, preparing professionals and providing outreach.

The college is unique among its peers in its comprehensive use of professional advisory boards, whose members are leaders in business, government, education and the social services. These experts provide guidance and support from their specialized fields to students and faculty and contribute powerful perspectives to curriculum development.

### Undergraduate

- Admissions
- Advising
- Career Services

### Admissions

Undergraduate students may enter the College of Human Environmental Sciences as freshmen. Some programs have requirements beyond those of the University. An entering freshman has the first year to explore the departments and the college as well as the combinations of subject areas for positions in fields such as education, health and welfare, business, industry and government.

All freshmen entering the College of Human Environmental Sciences enroll in GN\_HES 1100 Introduction to Human Environmental Sciences or SOC\_WK 1110 Introduction to the Social Work Major. These courses emphasize career decision-making, provide an orientation to the campus and the college, and bring into focus the role of a professional in the improvement of the quality of life in the near environment.

### Transfer Student Application

#### Human Environmental Sciences

Students in another MU school or college, or from another UM System campus, must have a cumulative GPA and term GPA of 2.0 or better to be eligible for admission to the College of Human Environmental Sciences. For students who transfer to the UM System from another institution and then apply for transfer into the college, transcripts are re-evaluated by the college to determine what courses will apply to the degree.

A student ineligible to enroll in another school or college may not enroll in the College of Human Environmental Sciences during the period of ineligibility. An appeal for admission may be made after the period of ineligibility is over.

#### School of Social Work

Undergraduate students who have been admitted to the University after attending another college may request a social work major. Those who have completed more than 55 credits need a GPA of 2.5 or higher on all college work attempted.

### Advising

Professional advising staff in the Student Services Office assists the students in planning their college programs.

Students earning credit from another institution will have a transfer equivalencies form completed by faculty for course work in their professional program. Transfer work is evaluated by the Office of Admissions. The HES Office of Student Services determines how transferred courses fit into a particular degree program.

It is the student's responsibility to initiate a graduation check to be certain that all requirements are met. An application for graduation should be submitted to the HES Student Services Office the semester preceding graduation. The application is available online at: [http://hes.missouri.edu/students\\_evalforgrad.html](http://hes.missouri.edu/students_evalforgrad.html)

### Career Services

Career services cover a spectrum of career programs. These include business, education and agriculture career services offices on the campus. The Student Services Office and individual advisers provide information regarding procedures. Career exploration and preparation information may be obtained in the Career Center.

### Graduate

The College of Human Environmental Sciences (HES) addresses human needs and enhances individual and family life in a diverse and global society by conducting advanced research. HES faculty have earned national and international research reputations while building programs that are valued by private citizens, government, business and industry, and human services agencies. The College has more than 400 graduate students enrolled in a variety of master's and doctoral degrees. Graduate certificates and online study are other academic options in several disciplinary areas.

Architectural Studies

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Human Development & Family Studies

Nutrition & Exercise Physiology

Personal Financial Planning

Textile & Apparel Management

Social Work

The [School of Social Work](#), housed within the College, offers a CSWE accredited Master of Social Work (MSW) Program that prepares competent, effective and ethical social work professional leaders for social change. The PhD program prepares students as educators and researchers with knowledge and skills to inform policy making, program development and evaluation, and research on clinical practice issues.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column. For a look at the College's online graduate degree programs, see [Mizzou Online](#).

## Architectural Studies

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R. B. Tofle, Chair  
College of Human Environmental Sciences  
137 Stanley Hall  
(573) 882-7224  
<http://arch.missouri.edu>

The Department of Architectural Studies is a dynamic and personal place engaged in the processes, procedures, observations and techniques essential to the development of environmental designs for human living, work and leisure. It can be placed between the world of physical realities and the imaginary.

Architectural studies uses the arts and the sciences: the exact science for its stability and durability, thermal and acoustic capabilities of buildings; and the social sciences to develop a better understanding of people's relationship with places and time.

### Faculty

**Professor** B. Schwarz\*\*, R. B. Tofle\*\*  
**Associate Professor** R. G. Phillips\*\*  
**Assistant Professor** B. Balakrishnan\*\*, N. D'Souza\*\*  
**Teaching Assistant Professor** M. Goldschmidt\*  
**Instructor** L. Bartlett  
**Professor Emeritus** R. Helmick\*  
**Associate Professor Emeritus** G. Hennigh  
**Assistant Professor Emeritus** P. Hildebrand

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Departmental Level Requirements (p. 494)
- BSHES in Architectural Studies (p. 494)
  - with emphasis in Architectural Studies (p. 494)
  - with emphasis in Interior Design (p. 495)
- Minor in Architectural Studies (p. 496)

#### Academic Advising Contact

Victoria Shahan  
106 Gwynn Hall  
(573) 882-6424  
[hesstudentservices@missouri.edu](mailto:hesstudentservices@missouri.edu)  
<http://hes.missouri.edu/>

#### Scholarship Information Contact

Nancy Schultz  
122 Gwynn Hall  
(573) 882-5142  
[hesdevelopment@missouri.edu](mailto:hesdevelopment@missouri.edu)

The Department of Architectural Studies offers a Bachelor of Science in Human Environmental Sciences with emphasis areas of either Architectural Studies or Interior Design. The Department's mission is

to educate future design practitioners, advance research of the built environment, and disseminate knowledge of architectural studies to improve quality of life for people.

The philosophy of the Department of Architectural Studies embraces the synergy created between architecture and interior design. Having a symbiotic relationship, both fields explore the design process and its final products. Promoting the meaning and value of physical settings and responding to the human condition, the program investigates the interaction between people and their surroundings to create a more beautiful and sustainable world. The program encourages an interdisciplinary, scholarly climate celebrating aesthetic values and the human sciences. The department also offers a minor in Architectural Studies.

Students may receive a minor in Entrepreneurship with required courses in Architectural Studies, an internship, and an additional 4 credits of specified coursework. See Undergraduate Minor in Entrepreneurship (p. 632) for more information.

### Portfolio Review and Admission to Studio Sequence in the Department of Architectural Studies

Students must apply for admission to the studio sequence required for undergraduate majors. Applications must be made at the end of the spring semester of the freshman level for enrollment in ARCHST 2811 Studio I.

Application forms with deadlines are available from the department and department website. Admittance decisions are based on:

1. Review of design work submitted in a portfolio, which should include:
  - Satisfactory completion of ARCHST 1200 Architectural Drafting and Working Drawings
  - Satisfactory completion of 2-dimensional design coursework from: ARCHST 1100 Visual Design OR ART\_GNRL 1030 Basic 2-D Design
  - Satisfactory completion of ART\_DRAW 1050 Drawing I
2. Overall grade point average (including transfer courses), grades received in courses completed, and ACT scores (or equivalent for transfer students)
3. Enrollment capacity (approximately 40 students)

### Laptop Computer Requirements

A laptop computer is required for the studio sequence at the beginning of the sophomore year. See department website for recommended specifications.

### Graduate

College of Human Environmental Sciences  
137 Stanley Hall  
573-882-7224  
<http://arch.missouri.edu/>

**Director of Graduate Studies:** Ronald Phillips

- MA in Architectural Studies (p. 496)
- MS in Architectural Studies (p. 497)

The College also offers a PhD in Human Environmental Sciences with an emphasis in Architectural Studies (p. 512).

## About the Program

The department's mission is to educate future design practitioners, advance research of the built environment and disseminate knowledge of architectural studies to improve quality of life for people. The philosophy of the Department of Architectural Studies embraces the synergy created between architecture and interior design. Having a symbiotic relationship, both fields explore the design process and its final products. Promoting the meaning and value of physical settings and responding to the human condition, the program investigates the interaction between people and their surroundings to create a more beautiful and sustainable world.

The program encourages an interdisciplinary, scholarly climate celebrating aesthetic values and the human sciences. Consistent attention is placed on planning and designing physical environments that support human needs and aspirations. Course work may include courses in supportive areas such as the human and physical sciences, art, humanities and allied design professions.

## Professional Opportunities

Career opportunities for master's and doctoral graduates of the Department and College include leadership positions in design; consultation practices in industry, government and education; and academic and administrative positions in higher education and research. Graduates from the MA degree program may pursue careers in the design professions, education and the advertising and entertainment industries. Graduates of the MS and PhD degree programs pursue academic and professional careers integrating design theory with their research skills.

## Financial Aid from the Program

Limited teaching and/or research assistantships and scholarships are available to graduate students. GTA appointments are available to resident graduate students and based on the match between the department's needs and candidate's background.

## Graduate Program Requirements

The academic program should be developed in consultation with an adviser by the end of the first full semester or at the successful conclusion of at least nine credit hours. See Graduate School website ('Doctoral Plan of Study and Degree Requirements') for guidelines and requirements regarding course work and role of dissertation committee. Students complete the online Graduate Student Progress System. Annual reviews of graduate students will be conducted to include the indicators listed by the Graduate School.

## Architectural Studies Degrees

Graduate programs offer two emphases: 1) in environment and behavior studies with a creative project leading to an MA degree and with research leading to the MS and PhD degrees and 2) in design with digital media studies leading to the MA, MS and PhD degrees. The graduate program builds on Architectural Studies course work and a core of courses in design theory, research methods, graduate seminars, research and readings in digital media and environment and behavior.

## Undergraduate

## Department Level Requirements - Architectural Studies

The Department of Architectural Studies has no department level requirements for the BSHES in Architectural Studies. All degree requirements can be found either in the BSHES in Architectural Studies with an emphasis in Architectural Studies (p. 494) page or the BSHES in Architectural Studies with an emphasis in Interior Design (p. 495) page.

## BSHES in Architectural Studies

### Major Program Requirements

The BSHES in Architectural Studies is offered with two emphasis area options: Architectural Studies (p. 494), and Interior Design (p. 495). All degree information is contained at the emphasis level.

### Semester Plan

Refer to the Semester Plans at the emphasis level.

## BSHES in Architectural Studies with Emphasis in Architectural Studies

### Major Program Requirements

The Architectural Studies emphasis prepares students at the undergraduate level for application to professional architectural programs as well as for other roles in society in related fields - in research, government, development, management, planning, etc. While many of these occupations do not require a professional license, they do require an understanding of, and exposure to, a professional education.

Students may choose to continue their program of study for a master's degree in architecture (M. Arch) at another university.

A program reciprocity agreement was developed with the University of Kansas (KU). All students interested in continuing their education are encouraged to maintain regular communication with the cooperating institution, because application and transfer procedures are subject to change. Students also continue at many other M. Arch programs in the U.S. where scholarships and other financial support may be available as determined by the institution.

<b>Basic Creative Development</b>		9
ARCHST 1100	Visual Design	3
ARCHST 2315	Introduction to Building Systems Laboratory	1
ARCHST 2316	Advanced Building Systems Lab	2
ARCHST 3100	Color and Light	3
<b>Design Planning and Analysis</b>		27
ARCHST 2811	Studio I	4
ARCHST 3182	Studio II	4
ARCHST 3860	Human Factors Programming	3
ARCHST 4823	Architectural Studio III	4
ARCHST 4824	Architectural Studio IV	4

ARCHST 4815	Construction Documents and Building Information Modeling Studio	4
ARCHST 4860	Programming for Thesis Design Studio	1
ARCHST 4990	Thesis Design Studio	4
<b>Design Communication</b>		9
ART_DRAW 1050	Drawing I	3
ARCHST 1200	Architectural Drafting and Working Drawings	3
ARCHST 2230	Design Communication I	3
<b>Technical Knowledge</b>		22
ARCHST 2220	Computer-Aided Drafting with AutoCad	3
ARCHST 2310	Building Systems	3
ARCHST 4320	Materials, Methods and Products	3
ARCHST 4323	Sustainable Technologies and Systems	3
ARCHST 4333	Compliance and Specifications	3
MATH 1400	Calculus for Social and Life Sciences I	3
PHYSICS 1210	College Physics I	4
<b>History of Art, Architecture and Interiors</b>		9
ARCHST 4410	History of the Designed Environment to 1750	3
ARCHST 4430	Guiding Design with Historic Preservation	3
ARCHST 4440	Design Precedents: Architecture, Interiors and Furniture since the Industrial Revolution	3
<b>Business</b>		3
ARCHST 4710	Design Business Practices	3
<b>Design Theory</b>		12
ARCHST 1600	Fundamentals of Environmental Design	3
ARCHST 2100	Understanding Architecture and the American City	3
ARCHST 3600	Environmental Analysis	3
ARCHST 4620	Environment and Behavior	3
<b>Electives - to equal 125 credit minimum total for the program</b>		

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GN_HES 1100	1	ART_DRAW 1050	3
ARCHST 1100	3	ARCHST 1600	3
ARCHST 1200	3	ARCHST 2315	1
ARCHST 2100	3	MATH 1100	3
ENGLISH 1000	3	Physical/Biological/Math Science	2
Social/Behavioral Science	3	American History or Government (also Soc/Beh Science)	3
	16		15
Second Year			
Fall	Credits	Spring	Credits
ARCHST 2220	3	ARCHST 3100	3
ARCHST 2230	3	ARCHST 3182	4
ARCHST 2310	3	ARCHST 3860	3

ARCHST 2316	2	ARCHST 4430	3
ARCHST 2811	4	MATH 1400	3
	15		16
Third Year			
Fall	Credits	Spring	Credits
ARCHST 3600	3	ARCHST 4323	3
ARCHST 4823	4	ARCHST 4333	3
ARCHST 4410	3	ARCHST 4440	3
PHYSICS 1210	4	ARCHST 4620	3
Communications	3	ARCHST 4824	4
	17		16
Fourth Year			
Fall	Credits	Spring	Credits
ARCHST 4320	3	ARCHST 4990	4
ARCHST 4710	3	Social/Behavioral Science	3
ARCHST 4815	4	HES Foundation	3
ARCHST 4860	1	Electives	4-5
HES Foundation	3		
Elective	2		
	16		14-15
Total Credits: 125-126			

## BSHES in Architectural Studies with Emphasis in Interior Design

### Major Program Requirements

The Interior Design emphasis is a four-year, first-professional baccalaureate interior design program accredited by the Council for Interior Design Accreditation (CIDA; formerly FIDER).

<b>Basic Creative Development</b>	9
ARCHST 1100 Visual Design	3
ARCHST 2315 Introduction to Building Systems Laboratory	1
ARCHST 2316 Advanced Building Systems Lab	2
ARCHST 3100 Color and Light	3
<b>Design Planning and Analysis</b>	27
ARCHST 2811 Studio I	4
ARCHST 3182 Studio II	4
ARCHST 3860 Human Factors Programming	3
ARCHST 4813 Interiors Studio III	4
ARCHST 4814 Interiors Studio IV	4
ARCHST 4815 Construction Documents and Building Information Modeling Studio	4
ARCHST 4860 Programming for Thesis Design Studio	1
ARCHST 4990 Thesis Design Studio	4
<b>Design Communication</b>	9
ART_DRAW 1050 Drawing I	3
ARCHST 1200 Architectural Drafting and Working Drawings	3
ARCHST 2230 Design Communication I	3

<b>Technical Knowledge</b>		15
ARCHST 2220	Computer-Aided Drafting with AutoCad	3
ARCHST 2310	Building Systems	3
ARCHST 4320	Materials, Methods and Products	3
ARCHST 4323	Sustainable Technologies and Systems	3
ARCHST 4333	Compliance and Specifications	3
<b>History of Art, Architecture and Interiors</b>		9
ARCHST 4410	History of the Designed Environment to 1750	3
ARCHST 4430	Guiding Design with Historic Preservation	3
ARCHST 4440	Design Precedents: Architecture, Interiors and Furniture since the Industrial Revolution	3
<b>Business</b>		3
ARCHST 4710	Design Business Practices	3
<b>Design Theory</b>		12
ARCHST 1600	Fundamentals of Environmental Design	3
ARCHST 2100	Understanding Architecture and the American City	3
ARCHST 3600	Environmental Analysis	3
ARCHST 4620	Environment and Behavior	3
<b>Electives - to equal 125 credit minimum total for the program</b>		

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GN_HES 1100	1	ART_DRAW 1050	3
ARCHST 1100	3	ARCHST 1600	3
ARCHST 1200	3	MATH 1100	3
ARCHST 2100	3	Physical/Biological/Math Science	2
ENGLSH 1000	3	American History or Government (also counts as Soc/Beh Science)	3
Social/Behavioral Science	3	ARCHST 2315	1
	<b>16</b>		<b>15</b>
Second Year			
Fall	Credits	Spring	Credits
ARCHST 2220	3	ARCHST 3100	3
ARCHST 2230	3	ARCHST 3182	4
ARCHST 2310	3	ARCHST 3860	3
ARCHST 2316	2	ARCHST 4430	3
ARCHST 2811	4	Bio/Phys/Math Science	3
	<b>15</b>		<b>16</b>
Third Year			
Fall	Credits	Spring	Credits
ARCHST 3600	3	ARCHST 4323	3
ARCHST 4320	3	ARCHST 4333	3
ARCHST 4410	3	ARCHST 4440	3
ARCHST 4813	4	ARCHST 4620	3
Communications	3	ARCHST 4814	4
	<b>16</b>		<b>16</b>

Fourth Year			
Fall	Credits	Spring	Credits
ARCHST 4710	3	ARCHST 4990	4
ARCHST 4815	4	Social/Behavioral Science	3
ARCHST 4860	1	HES Foundation	3
Bio/Phys/Math Science	3	Elective	5-6
HES Foundation	3		
Elective	2		
	<b>16</b>		<b>15-16</b>
Total Credits: 125-126			

## Minor in Architectural Studies

A minor in the Department of Architectural Studies is comprised of a minimum of 15 credits.

<b>Minor core requirements</b>		3
ARCHST 1600	Fundamentals of Environmental Design	3
<b>Electives</b>		12
Select from the following:		
ARCHST 1100	Visual Design	3
ARCHST 1200	Architectural Drafting and Working Drawings	3
ARCHST 2005	Topics in Architectural Studies - Humanities	3
ARCHST 2100	Understanding Architecture and the American City	3
ARCHST 2220	Computer-Aided Drafting with AutoCad	3
ARCHST 2310	Building Systems	3
ARCHST 2315	Introduction to Building Systems Laboratory	1
ARCHST 2316	Advanced Building Systems Lab	2
ARCHST 3100	Color and Light	3
ARCHST 4230	Computer Graphic Application for Design I	3
ARCHST 4323	Sustainable Technologies and Systems	3
ARCHST 4320	Materials, Methods and Products	3
ARCHST 4430	Guiding Design with Historic Preservation	3
ARCHST 4440	Design Precedents: Architecture, Interiors and Furniture since the Industrial Revolution	3
ARCHST 4555	Recent Trends	variable
ARCHST 4620	Environment and Behavior	3
ARCHST 4630	Shaping Human Settlements	3
ARCHST 4700	Place-Making in Community Design	3

For exceptional students, with consent of instructor and department approval, additional course work in the department may be selected.

## Graduate

### MA in Architectural Studies

#### Admission Contact Information

Dr. Ronn Phillips (phillipsr@missouri.edu)  
 137 Stanley Hall; Columbia, MO 65211  
 573-882-4575



## Admission Criteria

Fall deadline: January 15

Minimum GPA: 3.0

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

## Required Application Materials

To the Graduate School:

- All required Graduate School documents
- Statement of graduate goals and educational objectives discussing: which of the department's emphasis areas is of interest; intentions regarding the MA, MS; and request for a specific advisor (upload to online application)

To the Program:

- Application statement of graduate goals and educational objectives discussing: which of the department's emphasis areas is of interest; intentions regarding MA, MS, or PhD; and request for a specific advisor
- 3 letters of recommendation (excluding MU Architectural Studies faculty). Can be uploaded to the online
- Graduate School application or mailed directly to the program.
- For MA applicants only, electronic portfolio of images and/or publications. (Do not mail originals.)

## Master of Art

The creative, project-based, MA plan of study is often undertaken in preparation for careers in the design professions and education, as well as in the advertising and entertainment industries. The project is conducted in the area of design with digital media using high-end computer software. The culmination of the degree is a professionally reviewed, visual project employing digital media.

## Environment and Behavior Studies Emphasis

The Environment and Behavior Studies focuses on the multifaceted relationships between people and their physical, social, and cultural environments. Environment-behavior research explores a variety of environments, linking them to a range of behavioral concerns. This program is suitable for persons who seek careers in research, consulting, and/or teaching in architecture, interior design, and related environmental design disciplines. A design project leads to the MA and research leads to the MS or PhD degrees.

Current study areas in environment and behavior include:

- Design Research
- Design Education
- Learning Environments for Design
- History of the Designed Environment
- Design Planning and Analysis
- Aesthetics of Design
- Universal Design/Accessibility
- Environment and Aging
- Health Care Design

- Housing, Neighborhood Design, and Sustainability
- Organizational Systems and Design
- Facility Management and Design
- Programming, Design and Post-Occupancy
- Evaluation

Contact Dr. Ronn Phillips for more information about the department's graduate program or the emphasis in environment and behavior.

## Design with Digital Media Emphasis

Design with Digital Media, as an integral part of the design process, focuses on graphic ideation and the application of computer technology for architecture, interior design and related disciplines. This program of study has an emphasis on design with digital media leading to MA, MS, and PhD degrees. MA is a project-based program of study, whereas the MS is research-based.

Current study areas in the digital media program include:

- 3D analysis of form, space and design principles in architecture
- 3D modeling and rendering, animation
- Design computing and cognition
- Design process and creativity research
- Digital and integrative audiovisual media for design communication
- Digital design education for architecture and interiors
- Digital design studio
- Impact of digital media on design thinking
- Study, exploration and research of generative digital representation techniques
- Theories of filmic and moving images
- Theory of representation
- Video game technology for architecture and interiors
- Virtual reality and real-time environment

The culmination of the degree is a written and/or visual project employing computer applications for design methods. Applicants interested in the Design with Digital Media option should contact the coordinator of Design with Digital Media Dr. Bimal Balakrishnan for course content and research proposals.

## MS in Architectural Studies

### Admission Contact Information

Dr. Ronn Phillips (phillipsr@missouri.edu)  
137 Stanley Hall; Columbia, MO 65211  
573-882-4575

### Admission Criteria

Fall deadline: January 15

Minimum GPA: 3.0

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

### Required Application Materials

To the Graduate School:

All required Graduate School documents

Statement of graduate goals and educational objectives discussing: which of the department's emphasis areas is of interest; intentions regarding the MA, MS; and request for a specific adviser (upload to online application)

To the Program:

- Application statement of graduate goals and educational objectives discussing: which of the department's emphasis areas is of interest; intentions regarding MA, MS, or PhD; and request for a specific advisor
- 3 letters of recommendation (excluding MU Architectural Studies faculty). Can be uploaded to the online
- Graduate School application or mailed directly to the program

## Master of Science

The design and research-based MS plan of study is often undertaken in preparation for professional practice or design education. The project is conducted in emphasis areas as described below. Within each of these emphases, specific course work is selected based on subject matter, the type of design project and its research application. The culmination of the degree is a professionally reviewed design project with supporting written report. The research-based MS plan of study is often undertaken as preparation for the doctoral degree.

Research is conducted in one of two emphasis areas — design with digital media or environment and behavior studies. Within each emphasis area, specific course work is selected based on subject matter and the type of research method selected — quantitative, qualitative or a combination of both methods. The culmination of the degree is the written research thesis.

MS students must complete a final oral examination by an approved faculty committee and submit a presentation proposal at a professional conference or a manuscript in a professional journal.

## Environment and Behavior Studies Emphasis

The Environment and Behavior Studies emphasis area focuses on the multifaceted relationships between people and their physical, social, and cultural environments. Environment-behavior research explores a variety of environments, linking them to a range of behavioral concerns. This program is suitable for persons who seek careers in research, consulting, and/or teaching in architecture, interior design, and related environmental design disciplines. A design project leads to the MA and research leads to the MS or PhD degrees.

Current study areas in environment and behavior include:

- Design Research
- Design Education
- Learning Environments for Design
- History of the Designed Environment
- Design Planning and Analysis
- Aesthetics of Design
- Universal Design/Accessibility
- Environment and Aging
- Health Care Design
- Housing, Neighborhood Design, and Sustainability
- Organizational Systems and Design

- Facility Management and Design
- Programming, Design and Post-Occupancy
- Evaluation

Contact Dr. Ronn Phillips for more information about the department's graduate program or the emphasis in environment and behavior.

## Design with Digital Media Emphasis

Design with Digital Media, as an integral part of the design process, focuses on graphic ideation and the application of computer technology for architecture, interior design and related disciplines. This program of study has an emphasis on design with digital media leading to MA, MS, and PhD degrees. MA is a project-based program of study, whereas the MS is research-based.

Current study areas in the digital media program include:

- 3D analysis of form, space and design principles in architecture
- 3D modeling and rendering, animation
- Design computing and cognition
- Design process and creativity research
- Digital and integrative audiovisual media for design communication
- Digital design education for architecture and interiors
- Digital design studio
- Impact of digital media on design thinking
- Study, exploration and research of generative digital representation techniques
- Theories of filmic and moving images
- Theory of representation
- Video game technology for architecture and interiors
- Virtual reality and real-time environment

The culmination of the degree is a written and/or visual project employing computer applications for design methods. Applicants interested in the Design with Digital Media option should contact the coordinator of Design with Digital Media Dr. Bimal Balakrishnan for course content and research proposals.

## Exercise Physiology

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**Department Chair:** Christopher Hardin

340 H Life Science Building

(573) 882-4288

hardinc@missouri.edu

<http://ns.missouri.edu>

**Dietetics and Exercise Physiology Office**

106 McKee

(573) 882-7316

Fax: (573) 884-4885

**Director of Graduate Studies**

Jill Kanaley

117 Tucker Hall

(573) 882-2519

kanaleyj@missouri.edu

<http://ns.missouri.edu>

**Admission Contact Information**

Tammy Conrad

106 B McKee

573-882-1144

conradt@missouri.edu

<http://ns.missouri.edu>

## Faculty

**Professor** C. D. Hardin\*\*, J.A. Kanaley\*\*

**Associate Professor** S. Ball\*\*, S. Gable\*\*, P. S. Hinton\*\*, C. A. Peterson\*\*, J. Thyfault\*\*

**Assistant Professor** P. M. Landhuis\*, H. Leidy\*\*, R. S. Rector\*\*, V. Vieira-Potter\*

**Teaching Associate Professor** D.E. Brigham\*

**Teaching Assistant Professor** M. Raedeke\*

**Joint Faculty** M. J. Petris\*\*, L. Pulakat\*\*

**Adjunct Faculty** F. W. Booth\*, K. L. Fritsche\*\*, L. Hillman\*, Jamal A. Ibdah\*\*, D. Lubahn\*\*, G.Y. Sun\*\*, G.A. Weisman\*\*

**Adjunct Instructor** J.B. Mann, L. Hudson, T. Roberts, J. Schnell, R. Sharp, D. Showers, D. Smith

**Extension Faculty** J. Britt-Rankin\*, A. Cohen, C. Gabel, E.R. Schuster

**Professor Emeritus** R. P. Dowdy\*, Mary McDonald, Boyd L. O'Dell, T. R. Thomas\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

While MU does not offer undergraduate degrees specifically in exercise physiology, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Human Environmental Sciences, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Graduate

**Director of Graduate Studies:** Jill Kanaley

### Admission Contact Information

Tammy Conrad

106 B McKee

573-882-1144

conradt@missouri.edu

<http://ns.missouri.edu/>

- PhD in Exercise Physiology (p. 500)

## About the Program

The Nutritional Sciences Graduate Program in Exercise Physiology is designed to provide advanced training in both the basic and applied aspects of exercise, physical activity and physical inactivity. Currently, the research focus is to examine the mechanisms by which physical activity levels and/or exercise modulate risk and development of obesity, type 2 diabetes, and overall metabolic and cardiovascular diseases using both animal models and human subjects, and to be able to translate the findings into the clinical or applied setting. Graduate students will receive training in laboratory research, seminar preparation, scientific writing, problem solving and grant writing. Graduate studies at the University of Missouri offer the advantage of interdisciplinary exercise research that is facilitated by numerous collaborations at the many research centers at MU. In addition, the Exercise Physiology research program collaborates closely with other units on campus including the Department of Biomedical Sciences in the Vet School, and the Departments of Internal Medicine and Medical Pharmacology and Physiology in the School of Medicine among others.

The Exercise Physiology Graduate Program offers both MS and PhD degrees. These exercise physiology degrees are designed to prepare students for careers in exercise physiology or exercise physiology/nutrition. The curriculum has a scientific basis with core courses in exercise physiology, nutrition, biochemistry, and physiology. Teaching and research assistantships are available on a competitive basis.

## Areas of Research

Exercise physiology is a multidisciplinary program that integrates other disciplines such as biochemistry, nutrition, physiology, and biology. The primary focus of this department is prevention and treatment of chronic disease focusing primarily on physical activity/exercise, as well as considering nutrition. Current research focus of the faculty include: obesity, the metabolic syndrome, diabetes, physical inactivity, glucose control and intrahepatic fat accumulation.

## Research Facilities

The Nutrition and Exercise Physiology Department has an Exercise Physiology Laboratory (Lab) that is located in McKee Gym within the Department of Nutrition and Exercise Physiology. The Lab is a 4200 sq. ft. multi-room facility, with a large exercise testing room and associated smaller rooms for body composition assessment and other purposes. This space also enables us to do clinical testing such as repeated blood sampling on multiple subjects. Our facility also has a chemistry laboratory dedicated to blood handling and chemical analyses. Additionally there is a dedicated fitness center for supervised exercise training sessions.

In addition, the Department of Nutrition and Exercise Physiology is also currently building the Missouri University Nutritional Center for Health (MUNCH), a metabolic kitchen and research space designed for nutritional studies focused on adult and childhood obesity in Gwynn Hall, and is scheduled for completion in September 2014. The Exercise Physiology Laboratory and the MUNCH facility will provide a unique, integrated platform to examine the effects of exercise and diet on obesity and chronic disease.

Further the University of Missouri Health Care Hospital and Clinics (MUHC) are located a few blocks from McKee, and houses the MU Institute of Clinical and Translational Sciences (MU-ICTS). This facility has a recently renovated [Clinical Research Unit](#) (CRU) which allows for more outpatient clinical studies.

## Financial Aid from the Program

Assistantships are competitive and can be obtained in research, teaching, and community nutrition and fitness programs. Numerous scholarships also are available to attract incoming graduate students, including the Life Sciences Fellowship program.

## Graduate

### PhD in Exercise Physiology

#### Admission Contact Information

Tammy Conrad [conradt@missouri.edu](mailto:conradt@missouri.edu)  
 106B McKee  
 Columbia, MO 65211  
 573 882-1144

#### PhD Admission Criteria

Deadline for Fall entrance: Dec 30

- Prerequisites: general and organic chemistry, physiology (5 h), anatomy, nutrition, kinesiology, exercise physiology
- Minimum 3.5 graduate GPA (4.0=A)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	500

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1000 4.0
On or After August 1, 2011	150 3.5

#### Required Application Materials

To the Graduate School (210 Jesse Hall; Columbia, MO 65211):

All required Graduate School documents, including on line application

Required Supplementary Application Materials for the Program (upload online with your application to the Graduate School)

- Statement of Purpose: Upload a Statement of Purpose, indicating your academic/research interests and career goals to the "Supplemental Information" section of your online application.

- Resume or Vita: Upload a current Resume or Vita to the "Supplemental Information" section of your online application.
- Recommendations: Enter the required information for at least three recommenders in the "Recommendation: section of your online application. The recommenders will receive an email with instructions for completing and submitting your recommendation. Please ensure that the recommenders are aware of the December 30 application deadline.
- GRE Scores: Please make arrangements with Educational Testing Services to have official Graduate Record Exam (GRE) scores sent directly to our department. MU's Institutional code is 6875 and our department code: 0214.

## Financial Aid from the Program

Assistantships are competitive and can be obtained in research, teaching, and community nutrition and fitness programs. Numerous scholarships also are available to attract incoming graduate students, including the Life Sciences Fellowship program. In addition, outstanding students can apply for F21C fellowships. Other sources (university fellowships and minority recruiting) award assistantships-students also are sponsored by individual faculty members.

## Plan of Study

The PhD program requires 85 hours beyond the bachelor's degree. A committee of 4 faculty members must approve all graduate courses, including those hours those from other universities. The graduate coursework includes 15 hours in exercise physiology, plus coursework in physiology, nutrition, and biochemistry. Research requirements include NS 7500 (9 hours of research projects) and NS 9090 (12 hours dissertation). One semester of teaching experience is required, as is participation on a major external grant proposal.

## Possible Courses to select from:

### Exercise Science (Major Field)

NUTR_S 7840	Cardiovascular Health and Fitness	3
NUTR_S 7970	Sports Nutrition	2
NUTR_S 8030	Etiology of Obesity	3
NUTR_S 8850	Advanced Exercise Physiology (this class serves as the qualifying exam and minimum grade of a B is required)	3

### Exercise Physiology Research

NUTR_S 7500	Research in Nutritional Sciences	9
NUTR_S 9090	Doctorate Research in Nutritional Sciences	12

### Physiology Area (1st Support Area)

MPP 7310	Mammalian Cell Function	3-5
MPP 9430	Cardiovascular Physiology	3
NUTR_S 8870	Exercise Metabolism	3
or MPP 9431	Control of Energy Metabolism	
V_BSCI 8420	Veterinary Physiology	5
V_BSCI 9435	Skeletal Muscle	3

### Nutrition (2nd Support Area)

BIOCHM 7270	Biochemistry	3
BIOCHM 7272	Biochemistry	3
NUTR_S 7340	Human Nutrition II Lecture	3
NUTR_S 8030	Etiology of Obesity	3

NUTR_S 8085	Problems in Nutritional Sciences	3
NUTR_S 8310	Nutritional Biochemistry of Lipids	3
NUTR_S 8340	Nutrition in Human Health	3
<b>Research and Statistics (3rd Support Area)</b>		
ESC_PS 8830	Quantitative Analysis in Educational Research I	3
ESC_PS 8840	Quantitative Analysis in Educational Research II	3
	Advanced Statistics or Design	3
<b>Other Courses</b>		
AN_SCI 8420	Endocrinology	3
AN_SCI 9442	Vitamins and Minerals	4
MPP 9426	Transmembrane Signaling	4
NUTR_S 8090	Masters Research in Nutritional Sciences	12
		maximum
V_BSCI 9467	Neural Control of the Circulation	3

## Comprehensive Exam

The comprehensive exam process includes writing, defending, and submitting a major grant proposal.

## Reasonable Rate of Progress

At the end of each year the adviser will evaluate each doctoral student. Doctoral students must maintain a 3.5 GPA. In addition, each graduate student must maintain adequate research progress as judged by the adviser and/or graduate committee. Inadequate progress will result in a probationary period of 30 days to 1 semester.

## Human Development and Family Studies

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Jean M. Ispa, Co-Chair  
412 Gentry Hall  
(573) 882-2796

Lawrence Ganong, Co-Chair  
409 Gentry Hall  
(573) 882-6852  
<http://hdfs.missouri.edu>

### Advising Contact

Victoria Shahan  
106 Gwynn Hall  
(573) 882-6424  
[hesstudentservices@missouri.edu](mailto:hesstudentservices@missouri.edu)  
<http://hes.missouri.edu>

### Scholarship Information Contact

Nancy Schultz  
122 Gwynn Hall  
(573) 882-5142  
[hesdevelopment@missouri.edu](mailto:hesdevelopment@missouri.edu)

### Child Life Program Coordinator

Nora Hager  
314 Gentry Hall  
(573) 884-5997

### Child Development Laboratory Director

Jessie Bradley  
11 Gwynn Hall  
(573) 882-3999

## Faculty

**Millsap Professor** G. Carlo\*\*

**Professor** L. Ganong\*\*, J. M. Ispa\*\*, S. R. Jorgensen\*

**Associate Professor** C. Proulx\*\*, R. Ravert\*\*, D. Rudy\*\*, D. Schramm\*\*

**Assistant Professor** S. Killoren\*, L. Manfra\*\*

**Assistant Teaching Professor** T. Jamison\*, F. Palermo\*, C. Reeser\*

**Child Development Laboratory Instructor** E. Angst, N. Hager, P. Storey, S. Weiner

**Child Development Laboratory Assistant Instructor** S. L. Garton, D. Hathaway, K. Heim, J. A. Moore, E. Morrow, M. Pons, A. Robinson, B. York

**Adjunct Affiliated Faculty** A. Ball, J. Buehler, A. S. Deaton, J. Hawks, M. J. Herde, M. Herzog\*, R. Horstmeier, K. Kelley, M. Lehman, T. Meuser\*, S. Owsley, G. Petroski, K. Wallace, J. Wolff

**Curators Professor Emeritus** M. Coleman\*\*

**Professor Emeritus** K. Thornburg\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 503)
- BSHES in Human Development and Family Studies (p. 503)
  - with emphasis in Child Development and Education (p. 504)
  - with emphasis in Child Life Specialist (p. 505)
  - with emphasis in Family and Consumer Sciences Education (p. 507)
  - with emphasis in Families and Lifespan Development (p. 506)
  - with emphasis in General Human Development and Family Studies (p. 509)
  - with emphasis in General Human Development and Family Studies & Social Work (p. 509)
- Minor in Human Development and Family Studies (p. 509)

The Department of Human Development and Family Studies (HDFS) combines basic understanding of human development with preparation for professional service to individuals and families. Career opportunities are primarily found in human service agencies serving children, adolescents, older adults, parents and families. The human development and family studies major also prepares the student for graduate study in HDFS and related fields.

The department offers the BS HES with a major in Human Development and Family Studies. The student working with children and/or adults is encouraged to maximize the resources offered by the family. The student concerned with the quality of family life must also recognize the intricate spiral of changing needs in the developing individual. Students in the HDFS major must select one of the emphasis areas listed below. (Note: Emphasis areas appear on transcripts but not on diplomas.)

## Graduate

Admission Contact Information

Tyler Jamison [jamisonb@missouri.edu](mailto:jamisonb@missouri.edu)  
405 Gentry Hall  
573-882-1301

**Director of Graduate Studies:** Marilyn Coleman

- MA in Human Development and Family Studies (p. 509)
- MS in Human Development and Family Studies (p. 510)

The College also offers a PhD in Human and Environmental Studies with an emphasis Human Development and Family Studies (p. 513). They also offer Graduate Certificates in the following related areas: Youth Development Specialist (p. 546), Youth Development Program Management and Evaluation (p. 546), Gerontology (p. 546), and Geriatric Care Management (p. 546).

The Department of Human Development and Family Studies offers Master of Arts (applied emphasis) and Master of Science (research emphasis; on-campus only) degrees. The MA and MS degrees prepare students for positions in junior college or college teaching and leadership in public and private human service institutions. The MS degree also provides research training toward the PhD degree.

Selected in 2002 and again in 2007 as the Most Outstanding Graduate Department on campus, we have a nationally recognized faculty whose research productivity consistently has been ranked in the top 5% of the 235 family studies programs across the country. Our department houses

current and former journal editors as well as a past president of the National Council of Family Relations.

We have a well-established mentoring program, which begins as soon as the student is accepted into HDFS. We actively prepare our students to become successful academic scholars both in terms of research and teaching. The range of careers for which we prepare our students is unparalleled. Since 2000, our program has placed more faculty into research extensive family studies departments than any other program in the U.S. We also prepare PhDs and master's students for applied careers in administration, program evaluation, and program development. Our alumni have positions with universities and colleges in the United States, Canada, and Korea. We have developed an outstanding reputation as a place to study individual and family diversity and multiculturalism across the life course. Because we define diversity and multiculturalism broadly, our focus is on the multitude of ways that individuals and families may differ, including, but not limited to race, ethnicity, socioeconomic status, age, family structure, nationality, geographic location, and sexual orientation.

### Financial Aid from the Department

All applicants for the on-campus program are automatically considered for assistantships, fellowships, and other funding packages. Check the HDFS website or ask the program contact for additional details.

### About the Master's Degrees

The Department of Human Development and Family Studies offers Master of Arts (applied emphasis) and Master of Science (research emphasis; on-campus only) degrees. The MA and MS degrees prepare students for positions in junior college or college teaching and leadership in public and private human service institutions. The MS degree also provides research training toward the PhD degree.

### Areas of Study

On-campus students selecting the MA or MS degree may specialize in family studies, child life, early childhood development, life span development, family mediation, human services program (emphasis in administration or policy), or a dual-degree program in HDFS and the School of Law. Online students may select an MA specializing in gerontology, youth development, or family and community services.

### Master's Plan of Study Options

Programs are structured to provide students with an integration of theoretical perspectives, empirical research training, and practical experiences. The number of hours required for each master's degree is as follows:

- Family Studies: 36 hours
- Child Life: 30 (fast track) or 36 hours
- Early Childhood: 36 hours
- Life Span: 36 hours
- Family Mediation: 36 hours
- Human Services: 36 hours
- Gerontology: 36 hours
- Youth Development: 36 hours
- Family and Community Services: 36 hours
- Dual MSorMA/JD: approximately 113 hours

### About the PhD

The Department of Human Development and Family Studies PhD degree prepares students for careers in research, college or university teaching, or leadership positions in public and private human service institutions.

### PhD Plan of Study

Students selecting the doctoral degree work with members of their doctoral committee to create an individualized plan of study tailored to their specific research interests. Over the course of their degree program all doctoral students are required to enroll in six credit hours of research practicum, three credit hours of teaching practicum, and complete coursework in theory, research methods, statistics, and their collateral area. In addition, all doctoral students complete a minimum of 12 credit hours of research for their dissertation. A sample plan of study can be found on the HDFS website (<http://hdfs.missouri.edu/>).

### About the Online Certificate Programs

The Department of Human Development and Family Studies offers four online graduate certificates with specialization in youth development, youth development program management and evaluation, gerontology, and geriatric care management.

**Note:** Courses taken for any of the above certificate programs may be applied toward the related online MA degrees in youth development and gerontology. Up to 12 credits of coursework from the courses taken for any of the certificate programs may be applied toward their related online MA degrees described above.

For more information please follow the link to the certificate of interest.

## Undergraduate

### Department Level Requirements - Human Development & Family Studies

The Human Development and Family Studies Department does not have any specific Department Level Requirements. All degree requirements can be found on the BS HES in Human Development and Family Studies (p. 503) page and their respective emphasis area pages.

### BSHES in Human Development and Family Studies

### Major Program Requirements

Majors in all of the emphasis areas in HDFS must complete the core courses below:

**Grade of 2.0 (C) or better required in these core classes\*:**

Major Program Requirements		16
H_D_FS 1600	Foundations of Family Studies	3
H_D_FS 2200	Research Methods in Human Development and Family Studies	3
H_D_FS 2300	Multicultural Study of Children and Families	3

H_D_FS 2400	Principles of Human Development	4
H_D_FS 3420	Early and Middle Childhood	3

\* One grade of C- will be accepted in a core course.

Child Development Laboratory Courses such as H\_D\_FS 3500, H\_D\_FS 3700, and H\_D\_FS 4971 have prerequisites and require the consent of the instructor. Students must have full HDFS status. Because enrollment is limited, students must see the HDFS advisor to be placed on the waiting list a minimum of two semesters before anticipated enrollment. Students in Families and Lifespan Development may substitute another practicum experience with consent of department advisor.

In addition to the required courses, the degree program is completed with courses selected from within the department, from other areas in the College of Human Environmental Sciences, and from the social sciences and allied professional fields such as education, recreation, business and health. For some students, courses in the arts, humanities, or biological sciences may be appropriate.

## BSHES in Human Development and Family Studies with Emphasis in Child Development and Education

### Major Program Requirements

This emphasis is designed to prepare graduates for positions of responsibility and leadership in public and private preschool programs, child-care centers, infant-care programs, after-school programs and other educational and social service settings that serve families and children. Additional job opportunities include group homes, shelters, child care and provider training agencies, Parents as Teachers, and YMCA/YWCA.

The general goal of the emphasis area is to provide instruction and experience to help students gain competence in working with young children and their families. The emphasis is on understanding human development, with primary focus on child development, early childhood education, and children's relationships with family members. Attention is also devoted to the development of working relationships with professional colleagues and community workers.

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

#### A. Requirements in H D FS

Subject area requirements in HDFS			61
H_D_FS 1600	Foundations of Family Studies * <sup>1</sup>	3	
H_D_FS 2200	Research Methods in Human Development and Family Studies * <sup>1</sup>	3	
H_D_FS 2300	Multicultural Study of Children and Families * <sup>1</sup>	3	
H_D_FS 2400	Principles of Human Development * <sup>1</sup>	4	
H_D_FS 3420	Early and Middle Childhood * <sup>1</sup>	3	
H_D_FS 3430	Adolescence and Young Adulthood	3	
H_D_FS 3500	Infant-Toddler Development and Programs * <sup>1</sup>	6	
H_D_FS 3510	Curriculum and Activities for the Early Childhood Setting * <sup>1</sup>	3	

H_D_FS 3530	Foundations of Community-Based Programs for Children and Youth * <sup>1</sup>	3
H_D_FS 3600	Working With Parents	3
H_D_FS 3700	Child Development Laboratory * <sup>1</sup>	6
H_D_FS 3800	Children's Play	3
H_D_FS 4420	Environmental Influences on Lifespan Cognition	3
H_D_FS 4570	Development and Administration of Child Services Programs * <sup>1</sup>	3
H_D_FS 4720	Child and Family Advocacy	3
H_D_FS 4971	Child Development and Education Capstone * <sup>1</sup>	9

#### B. Requirements in related areas

STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or ESC_PS 4170	Introduction to Applied Statistics	
PHIL 1100	Introduction to Ethics	3
LTC 4510	Assessment in Early Childhood Education	3
SPC_ED 4300	Introduction to Special Education	3

#### C. Supporting Coursework (from HDFS and related areas)

General Elective	3
General Elective	3
General Elective	3
General Elective	3

\* Student must earn 2.00 (C) or better in course.

<sup>1</sup> One C- may be earned in the above marked (1) courses.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GN_HES 1100	1	MATH 1100	3
H_D_FS 1600	3	H_D_FS 2400	4
ENGLSH 1000	3	Science	3-5
PSYCH 1000	3	SOCIOL 1000	3
NUTR_S 1034	3		
PHIL 1100	3		
	16		13-15
Second Year			
Fall	Credits	Spring	Credits
H_D_FS 2200	3	American History/Government	3
H_D_FS 3420	3	H_D_FS 2300	3
FINPLN 2183	3	H_D_FS 3530	3
H_D_FS 3510	3	General Elective	3
Supporting Coursework	3	Statistics	3
	15		15



Third Year			
Fall	Credits	Spring	Credits
H_D_FS 3500	6	COMMUN 1200	3
LTC 4510	3	H_D_FS 3430	3
General Elective	3	H_D_FS 3600	3
General Elective	3	H_D_FS 4420	3
		Science	1-3
		H D FS Elective	3
	15		16-18
Fourth Year			
Fall	Credits	Spring	Credits
H_D_FS 3700	6	H_D_FS 4971	9
H_D_FS 3800	3	H_D_FS 4720	3
H_D_FS 4570	3	Humanities	3
SPC_ED 4300	3		
Humanities	3		
	18		15
Total Credits: 123-127			

## BSHES in Human Development and Family Studies with Emphasis in Child Life Specialist

### Major Program Requirements

This emphasis prepares graduates to provide for the social-emotional needs, and support the optimum growth and development of children and their families in a variety of health care settings. Child life specialists use therapeutic play, psychological preparation, and coping skills interventions to help reduce the anxiety and stress related to illness, disability, hospitalization and medical procedures. Through a family-centered care approach, they provide parents and other family members reassurance and emotional support, help them understand children's psychosocial needs, and provide tools to help them minimize psychological trauma.

Courses focus on understanding normal and exceptional child and family development, effective methods of working with children and families, as well as integration of theory and research into hands-on clinical practice experiences (evidence-based practice). Students who successfully complete the degree program should be well prepared to take the Child Life Professional Certification Exam presented by the Child Life Council Certification Committee. The student's last semester is spent outside Columbia in a 480-clock-hour (minimum) clinical internship in a pediatric hospital setting.

This academic emphasis requires that students successfully complete child life volunteer, practicum, and clinical internship experiences to attain this degree, as well as be eligible to take the national Child Life Certification Exam to obtain the CCLS credential. Clinical education sites require that students provide proof of health insurance, up-to-date immunizations, and student professional liability insurance. Students must also pass mandatory drug screens, criminal background checks, and any other additional qualification checks prior to beginning any clinical education experience in child life.

Failure to provide appropriate documentation, or pass drug screens and criminal background checks prior to the beginning of these experiences may result in dismissal from the child life degree program in HDFS. The student is responsible for all costs incurred with these qualification checks.

Students must complete all university requirements (p. 17), including general education (p. 18), **in addition to** the degree requirements below. All courses in sections A-B below are required.

A. Requirements in HDFS		68
H_D_FS 1600	Foundations of Family Studies *	3
H_D_FS 2200	Research Methods in Human Development and Family Studies *	3
H_D_FS 2300	Multicultural Study of Children and Families *	3
H_D_FS 2400	Principles of Human Development *	4
H_D_FS 3420	Early and Middle Childhood *	3
H_D_FS 3430	Adolescence and Young Adulthood	3
H_D_FS 3500	Infant-Toddler Development and Programs *	6
H_D_FS 3600	Working With Parents	3
H_D_FS 3700	Child Development Laboratory *	6
H_D_FS 4085	Problems in Human Development and Family Studies (Child Life Volunteering) ****	1
H_D_FS 4100	Children in Health Care Settings	3
H_D_FS 4110	Child Life Theory and Practice	3
H_D_FS 4130	Child Life Practicum **	3
H_D_FS 4400	Childhood Death and Bereavement	3
H_D_FS 4570	Development and Administration of Child Services Programs	3
H_D_FS 4720	Child and Family Advocacy	3
or H_D_FS 4700	Children and Families in Poverty	
Supporting Coursework - See adviser for list of course options		6
H_D_FS 4993	Internship in Human Development and Family Studies ***	15

B. Required in Related Areas		13-15
PSYCH 1000	General Psychology	3
SOCIOL 1000	Introduction to Sociology	1-3
PHIL 2440	Medical Ethics	3
CPD 2190	Medical Terminology	3
STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or ESC_PS 4170	Introduction to Applied Statistics	

\* Student must earn 2.00 (C) or better in course.

\*\* Students are admitted to H\_D\_FS 4130 on a competitive, space-available basis. Interview applications are considered the semester before the student wishes to take H\_D\_FS 4130. Student must have attained a 3.0 CUM GPA to be eligible to interview.

\*\*\* Students are admitted to H\_D\_FS 4993 after satisfactory completion of H\_D\_FS 4130 (grade of 3.0 or higher). Students must be selected by hospitals through a student initiated competitive application process.

\*\*\*\* Should be completed prior to end of sophomore year.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GN_HES 1100	1	SOCIOL 1000	3
ENGLISH 1000	3	H_D_FS 2300	3
H_D_FS 1600	3	H_D_FS 2400	4
PSYCH 1000	3	MATH 1100	3
Humanities	3	BIO_SC 1010	3
	13		16
Second Year			
Fall	Credits	Spring	Credits
H_D_FS 3420	3	CPD 2190	3
PTH_AS 2201	3	H_D_FS 2200	3
HIST or POL SC	3	H_D_FS 3500	6
COMMUN 1200	3	H_D_FS 3430	3
H_D_FS 4085	1	PTH_AS 2203	2
FINPLN 2183	3		
	16		17
Third Year			
Fall	Credits	Spring	Credits
H_D_FS 4100	3	H_D_FS 3600	3
H_D_FS 3700	6	H_D_FS 4110	3
NUTR_S 1034	3	Supporting Coursework	3
STAT	3	H_D_FS 4400	3
		H_D_FS 4700 or 4720	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
H_D_FS 4130	3	H_D_FS 4993	15
H_D_FS 4570	3		
PHIL 2440	3		
Supporting Coursework	3		
General Elective	1		
	13		15
Total Credits: 120			

# BSHES in Human Development and Family Studies with Emphasis in Families and Lifespan Development

## Major Program Requirements

Courses required for Certified Family Life Educator can be found at <http://hdfs.missouri.edu/current.html> under the CFLE Certification information.

Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

A. Requirements in H D FS		56-62
STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or ESC_PS 4170	Introduction to Applied Statistics	
PHIL 1100	Introduction to Ethics	3
or PHIL 2440	Medical Ethics	
PSYCH 1000	General Psychology	3
SOCIOL 1000	Introduction to Sociology	3
or RU_SOC 1000	Rural Sociology	
H_D_FS 1600	Foundations of Family Studies *	3
H_D_FS 2200	Research Methods in Human Development and Family Studies *	3
H_D_FS 2300	Multicultural Study of Children and Families *	3
H_D_FS 2400	Principles of Human Development *	4
H_D_FS 2450	Human Sexuality Across the Life Span	3
H_D_FS 3420	Early and Middle Childhood *	3
H_D_FS 3430	Adolescence and Young Adulthood	3
H_D_FS 3440	Adulthood and Aging	3
H_D_FS 3500	Infant-Toddler Development and Programs	3-6
or H_D_FS 3700	Child Development Laboratory	
or H_D_FS 3730	Field Training Practicum	
H_D_FS 4610	Stress in Families	3
or H_D_FS 4700	Children and Families in Poverty	
H_D_FS 4620	Family Interaction	3
H_D_FS 4640	Interpersonal Relationships	3
H_D_FS 4970	Families and Lifespan Development Capstone **	4
H_D_FS 4993	Internship in Human Development and Family Studies	3-6
B. Related Electives		
Select 24 credits from the following:		24
H_D_FS 1610	Intimate Relationships and Marriage	3
H_D_FS 3085	Problems in Human Development and Family Studies	1-3
or H_D_FS 4085	Problems in Human Development and Family Studies	
H_D_FS 3090	Research Experience in Human Development and Family Studies	1-6

H_D_FS 3500	Infant-Toddler Development and Programs (if not taken as a required course - see requirements in HDFS above)	6
H_D_FS 3600	Working With Parents	3
H_D_FS 3700	Child Development Laboratory (if not taken as a required course - see requirements in HDFS above)	6
H_D_FS 3730	Field Training Practicum (if not taken as a required course - see requirements in HDFS above)	3
H_D_FS 3800	Children's Play	3
H_D_FS 4090	Advanced Research in Human Development and Family Studies	1-6
H_D_FS 4200	Latino/a Youth and Families	3
H_D_FS 4300	Black Families	3
H_D_FS 4400	Childhood Death and Bereavement	3
H_D_FS 4420	Environmental Influences on Lifespan Cognition	3
H_D_FS 4570	Development and Administration of Child Services Programs	3
H_D_FS 4610	Stress in Families (if not taken as a required course - see requirements in HDFS above)	3
H_D_FS 4630	The Process of Divorce	3
H_D_FS 4700	Children and Families in Poverty (if not taken as a required course - see requirements in HDFS above)	3
H_D_FS 4720	Child and Family Advocacy	3
H_D_FS 4001	Topics in Human Development and Family Studies	9-99

\* Students must earn a 2.0 (C) or better in these courses, with the exception that one C- maybe be earned. H\_D\_FS 1600 must be taken before H\_D\_FS 2300 or any 3000/4000-level H\_D\_FS course.

\*\* Cannot be completed until successful completion of H\_D\_FS core courses and H\_D\_FS 3430, H\_D\_FS 3440 and 12 credit from H\_D\_FS 4610, H\_D\_FS 4620, H\_D\_FS 4630, H\_D\_FS 4640 and H\_D\_FS 4700 or consent of instructor. 3 credit hours of these 3000/4000-level courses can be concurrent with H\_D\_FS 4970.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GN_HES 1100	1	H_D_FS 2400	4
H_D_FS 1600	3	Supporting Coursework	3
NUTR_S 1034	3	SOCIOL 1000	3
ENGLISH 1000	3	MATH 1100	3
PSYCH 1000	3	Humanities	3
Science	1		
	14		16
Second Year			
Fall	Credits	Spring	Credits
H_D_FS 2200	3	Statistics	3
H_D_FS 2300	3	H_D_FS 3420	3

H D FS Related Elective	3	H_D_FS 3430	3
PHIL 1100 or 2440	3	H D FS Related Elective	3
Humanities	3	Am History or Government	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
H_D_FS 3440	3	H_D_FS 4620	3
H_D_FS 3730	3	H D FS Related Elective	3
H_D_FS 4610	3	Science	5
COMMUN 1200	3	Supporting Coursework	3
FINPLN 2183	3		
	15		14
Fourth Year			
Fall	Credits	Spring	Credits
H_D_FS 2450	3	H_D_FS 4700	3
H_D_FS 4640	3	H_D_FS 4993	3-6
H_D_FS 4970	4	H D FS Related Elective	3
H D FS Related Elective	3	H D FS Related Elective	3
Supporting Coursework	3	General Elective	3
	16		15-18
Total Credits: 120-123			

## BSHES in Human Development and Family Studies with Emphasis in Family and Consumer Sciences Education

### Major Program Requirements

This emphasis prepares graduates for certification to teach family and consumer sciences from birth to grade 12 in public schools. The program combines courses in the human sciences with courses in teacher preparation from the College of Education. In order to progress to Phase II, students must earn a minimum GPA of 2.75, C-Base minimum score of 235 and PRAXIS minimum score of 162.

This academic emphasis requires that students successfully complete field experiences and a student teaching internship. Public schools require that students provide proof of up-to-date immunizations and professional liability insurance. Criminal background checks and other qualifications may be required depending on the school.

Students must complete the field experience and internship to earn the degree and be eligible for recommendation for state certification to teach. Failure to provide appropriate documentation, or pass criminal background checks may result in dismissal from the program. The student is responsible for all costs incurred with these requirements.

Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

Emphasis requirements		15
CHEM 1100	Atoms and Molecules with Lab	3
ECONOM 1014	Principles of Microeconomics	3

or ECONOM 1015	Principles of Macroeconomics	
or AG_EC 1041	Applied Microeconomics	
or AG_EC 1042	Applied Macroeconomics	
H_D_FS 2200	Research Methods in Human Development and Family Studies	3
PHIL 1100	Introduction to Ethics	3
or PHIL 2400	Ethics and the Professions	
PSYCH 1000	General Psychology	3
STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or ESC_PS 4170	Introduction to Applied Statistics	
<b>FCS Content Area Requirements *</b>		<b>47</b>
ARCHST 2100	Understanding Architecture and the American City	3
ARCHST 4440	Design Precedents: Architecture, Interiors and Furniture since the Industrial Revolution	3
FINPLN 2183	Personal and Family Finance	3
FINPLN 4483	Financial Success	1
H_D_FS 1600	Foundations of Family Studies	3
H_D_FS 2300	Multicultural Study of Children and Families	3
H_D_FS 2400	Principles of Human Development	4
H_D_FS 3420	Early and Middle Childhood (or equivalent)	3
H_D_FS 3600	Working With Parents	3
H_D_FS 4640	Interpersonal Relationships	3
H_D_FS 4720	Child and Family Advocacy	3
HSP_MGMT 1991	Food Service Sanitation Management	1
HSP_MGMT 1995	Culinary Fundamentals	3
LTC 1200	Coordinated School Health	2
NUTR_S 1034	Nutrition, Current Concepts and Controversies	3
NUTR_S 1340	Introduction to Exercise and Fitness	3
T_A_M 1200	Basic Concepts of Apparel Design and Production	3
or T_A_M 2500	Social Appearance in Time and Space	
T_A_M 2200	Science of Textiles	3
<b>FCS Teacher Development Requirements *</b>		<b>47</b>
COMMUN 1200	Public Speaking	3
ED_LPA 4060	Inquiring into Schools, Community and Society II ***	3
ESC_PS 2010	Inquiry Into Learning I	3
ESC_PS 2014	Inquiry into Learning I - Field Experience	1
GN_HES 1100	Introduction to Human Environmental Sciences	1
H_D_FS 4800	Program and Curriculum Design for FACS Education in Middle and Secondary Schools	3
H_D_FS 4820	Assessment in Family and Consumer Sciences Education ***	2
H_D_FS 4830	Methods of Teaching FACS in Middle and Secondary Schools ***	3
H_D_FS 4940	Field Experience in Family and Consumer Sciences	1

H_D_FS 4941	Field Experience in Family and Consumer Sciences ***	1
H_D_FS 4942	Student Teaching FACS in Middle and Secondary Schools ***	15
LTC 2040	Inquiring into Schools, Community and Society I ***	3
LTC 2044	Inquiry into Schools, Community and Society: Field ***	1
LTC 4560	Teaching Reading in the Content Areas ***	2
SPC_ED 4020	Inquiry into Learning II ***	3

\* Must earn 2.00 or better in course.

\*\*\* Must have completed General Certification Requirements, Professional Education Requirements for ESC\_PS 2010 and ESC\_PS 2014 prior to enrolling.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
CHEM 1100	3	American Government Course	3
ENGLISH 1000	3	H_D_FS 2300	3
GN_HES 1100	1	MATH 1100	3
H_D_FS 1600	3	PHIL 1100 or 2400	3
NUTR_S 1034	3	T_A_M 1200	3
PSYCH 1000	3		
	<b>16</b>		<b>15</b>
Second Year			
Fall	Credits	Spring	Credits
ARCHST 2100	3	COMMUN 1200	3
ECONOM 1014, 1015, AG_EC 1041, or AG_EC 1042	3	FINPLN 2183	3
ESC_PS 2010 & ESC_PS 2014	4	H_D_FS 2400	4
NUTR_S 1340	3	HSP_MGMT 1991	1
T_A_M 2200	3	LTC 2040 & LTC 2044	4
	<b>16</b>		<b>15</b>
Third Year			
Fall	Credits	Spring	Credits
ARCHST 4440	3	ESC_PS 4170	3
FINPLN 4483	1	H_D_FS 3420	3
H_D_FS 2200	3	H_D_FS 4800 & H_D_FS 4940	4
H_D_FS 3600	3	H_D_FS 4720	3
HSP_MGMT 1995	3	SPC_ED 4020	3
LTC 1200	2		
	<b>15</b>		<b>16</b>

Fourth Year			
Fall	Credits	Spring	Credits
ED_LPA 4060	3	H_D_FS 4942	15
H_D_FS 4640	3		
H_D_FS 4820	2		
H_D_FS 4830 & H_D_FS 4941	4		
LTC 4560	2-3		
	14-15		15
Total Credits: 122-123			

## BSHES in Human Development & Family Studies with emphasis in General HDFS

This degree program is under revision at this time. Contact the HES Student Services Offices for additional information on course requirements.

## BSHES in Human Development & Family Studies with emphasis in General HDFS & Social Work

### Major Program Requirements

We are not currently accepting applicants for this emphasis area. Contact the Human Environmental Sciences Advising (p. 502) office for further information.

### Semester Plan

There is not a semester plan for this emphasis area.

## Minor in Human Development and Family Studies

A minor in HDFS may be obtained by taking 16 credits in the following courses:

H_D_FS 1600	Foundations of Family Studies	3
H_D_FS 1610	Intimate Relationships and Marriage	3
H_D_FS 2300	Multicultural Study of Children and Families	3
H_D_FS 2400	Principles of Human Development	4
H_D_FS 3420	Early and Middle Childhood (or equivalent) *	3
or H_D_FS 3430	Adolescence and Young Adulthood	
or H_D_FS 3440	Adulthood and Aging	
Total Credits		16

\* Students who have completed PSYCH 2410, ESC\_PS 2500 cannot receive credit for H\_D\_FS 3420.

## Graduate

## MA in Human Development and Family Studies

### Admission Contact Information

Marilyn Coleman colemanma@missouri.edu  
314 Gentry; Columbia, MO 65211  
573-882-4360

### Admission Criteria for Campus Programs

Fall deadline: December 15

Spring deadline: November 15

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	50th percentile	50th percentile	50th percentile
On or After August 1, 2011	50th percentile	50th percentile	50th percentile

\*Some exceptions are made

- Minimum GPA: 3.0 for last 60 hours  
Required Application Materials for Campus Programs (submitted online via the apply yourself system)
- Application form
- 3 letters of recommendation from people who can speak to applicant's potential to do graduate work (e.g., professors, advisors).
- GRE score (and TOEFL score for international applicants)
- Personal statement
- Resume or Curriculum Vitae
- Official Transcripts

### Admission Criteria for Online Programs

- No Admission Deadlines (We guarantee processing of complete applications received at least two months prior to the beginning of the expected term of admission. This will give admitted students adequate time to enroll in coursework.)
- Minimum GPA: 3.0 for last 60 hours

### Required Application Materials for Online Programs

submit online via the apply yourself system

- Application form
- 3 letters of recommendation from people who can speak to applicant's potential to do graduate work (e.g., professors, advisors).
- Personal statement
- Resume or Curriculum Vitae
- Official Transcripts

## Plan of Study Options

Programs are structured to provide students with an integration of theoretical perspectives, empirical research training, and practical experiences. The number of hours required for each master's degree is as follows:

- Family Studies: 36 hours
- Child Life: 30 (fast track) or 36 hours
- Early Childhood: 36 hours
- Life Span: 36 hours
- Family Mediation: 36 hours
- Human Services: 36 hours
- Gerontology: 36 hours
- Youth Development: 36 hours
- Family and Community Services: 36 hours
- Dual MSorMA/JD: approximately 113 hours Research

Based on their chosen degree option and whether they are pursuing the MS or MA degree, master's students may write a thesis (H\_D\_FS 9090), complete a project (H\_D\_FS 8090), or do an internship (H\_D\_FS 8972) for up to six credit hours. The thesis requires testing a hypothesis or exploring a research question. The project option is no less scholarly than a thesis, but usually has an applied focus. For instance, a project may involve designing a program and developing curriculum materials (e.g., instructional videotapes, websites, resource manuals). Internships are often conducted off-campus and must be negotiated with the student's advisor and approved by the student's faculty committee. Students who wish to pursue the thesis option must petition the department's graduate faculty for approval. Students completing a thesis earn a Master of Science degree. Those completing a project or internship earn the Master of Arts. For more detailed information, please refer to the HDFS Graduate Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## Satisfactory Progress

Satisfactory progress is based on the student maintaining a sufficient GPA according to the student's program or funding guidelines and completing all degree forms and milestones according to departmental timelines. For a detailed description of the department's description of a satisfactory rate of academic progress, please refer to the HDFS Graduate Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## Time Limits for Masters' Degree Completion

Students working toward the master's degree have 5 years from the semester the first course is taken in which to complete all degree requirements. Extensions for one additional year to complete the degree may be granted with submission of a detailed plan for completion, including a timetable. Students must be making progress toward completion when they apply for the extension. A maximum of two extensions may be granted.

## MS in Human Development and Family Studies

Admission Contact Information  
Marilyn Coleman [colemanma@missouri.edu](mailto:colemanma@missouri.edu)

314 Gentry; Columbia, MO 65211  
573-882-4360

## Admission Criteria for Campus Programs

Fall deadline: December 15  
Spring deadline: November 15

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	50th percentile	50th percentile
On or After August 1, 2011	50th percentile	50th percentile

\*Some exceptions are made

- Minimum GPA: 3.0 for last 60 hours  
Required Application Materials for Campus Programs (submitted online via the apply yourself system)
- Application form
- 3 letters of recommendation from people who can speak to applicant's potential to do graduate work (e.g., professors, advisors).
- GRE score (and TOEFL score for international applicants)
- Personal statement
- Resume or Curriculum Vitae
- Official Transcripts

## Admission Criteria for Online Programs

- No Admission Deadlines (We guarantee processing of complete applications received at least two months prior to the beginning of the expected term of admission. This will give admitted students adequate time to enroll in coursework.)
- Minimum GPA: 3.0 for last 60 hours

## Required Application Materials for Online Programs

submit online via the *applyyourself* system

- Application form
- 3 letters of recommendation from people who can speak to applicant's potential to do graduate work (e.g., professors, advisors).
- Personal statement
- Resume or Curriculum Vitae
- Official Transcripts

## Plan of Study Options

Programs are structured to provide students with an integration of theoretical perspectives, empirical research training, and practical experiences. The number of hours required for each master's degree is as follows:

- Family Studies: 36 hours
- Child Life: 30 (fast track) or 36 hours
- Early Childhood: 36 hours
- Life Span: 36 hours

- Family Mediation: 36 hours
- Human Services: 36 hours
- Gerontology: 36 hours
- Youth Development: 36 hours
- Family and Community Services: 36 hours
- Dual MSorMA/JD: approximately 113 hours Research

Based on their chosen degree option and whether they are pursuing the MS or MA degree, master's students may write a thesis (H\_D\_FS 9090 (p. 509)), complete a project (H\_D\_FS 8090 (p. 509)), or do an internship (H\_D\_FS 8972 (p. 509)) for up to six credit hours. The thesis requires testing a hypothesis or exploring a research question. The project option is no less scholarly than a thesis, but usually has an applied focus. For instance, a project may involve designing a program and developing curriculum materials (e.g., instructional videotapes, websites, resource manuals). Internships are often conducted off-campus and must be negotiated with the student's advisor and approved by the student's faculty committee. Students who wish to pursue the thesis option must petition the department's graduate faculty for approval. Students completing a thesis earn a Master of Science degree. Those completing a project or internship earn the Master of Arts. For more detailed information, please refer to the HDFS Graduate Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## Research

Based on their chosen degree option and whether they are pursuing the MS or MA degree, master's students may write a thesis (H\_D\_FS 9090), complete a project (H\_D\_FS 8090), or do an internship (H\_D\_FS 8972) for up to six credit hours. The thesis requires testing a hypothesis or exploring a research question. The project option is no less scholarly than a thesis, but usually has an applied focus. For instance, a project may involve designing a program and developing curriculum materials (e.g., instructional videotapes, websites, resource manuals). Internships are often conducted off-campus and must be negotiated with the student's advisor and approved by the student's faculty committee. Students who wish to pursue the thesis option must petition the department's graduate faculty for approval. Students completing a thesis earn a Master of Science degree. Those completing a project or internship earn the Master of Arts. For more detailed information, please refer to the HDFS Graduate Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## Satisfactory Progress

Satisfactory progress is based on the student maintaining a sufficient GPA according to the student's program or funding guidelines and completing all degree forms and milestones according to departmental timelines. For a detailed description of the department's description of a satisfactory rate of academic progress, please refer to the HDFS Graduate Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## Time Limits for Masters' Degree Completion

Students working toward the master's degree have 5 years from the semester the first course is taken in which to complete all degree requirements. Extensions for one additional year to complete the degree may be granted with submission of a detailed plan for completion, including a timetable. Students must be making progress toward

completion when they apply for the extension. A maximum of two extensions may be granted.

## Human Environmental Sciences

### Human Environmental Sciences Extension Specialist

A student who plans to be an extension specialist may choose a subject-matter area of interest. In addition, a master's degree in a subject-matter area generally is required in Missouri.

The student must fulfill the requirements for the chosen major while pursuing the extension objective. Additional electives can be chosen from such areas as adult education, communications and the social sciences.

### Faculty

**Professor** L. Ganong\*\*, J. Ispa\*\*, S. Jorgensen\*, B. Schwarz\*\*, R. B Tofle\*\*

**Millsap Professor** G. Carlo\*\*

**Curator's Professor** M. Coleman\*\*

**Associate Professor** T. Cooney\*\*, R. Phillips\*\*, D. Rudy\*\*, D. L. Sharpe\*\*, R. O. Weagley\*\*

**Assistant Professor** B. Balakrishnan\*\*, N. D'souza\*\*, S. Killoren, L. Manfra\*\*, C. Proulx\*\*, R. Ravert\*\*, D. Schramm\*\*, R. Yao\*

**Assistant Teaching Professor** M. Goldschmidt\*, S. L. Green-Ivey, F. Palermo, C. Reeser\*

**Assistant Research Professor** M. Herzog\*

**Professor Emeritus** R. Helmick\*, K. Thornburg\*

**Instructor** R. Law, AFC

**Associate State Personal Finance Specialist** B. Procter, L. Schrader, A. Zumwalt

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in human environmental sciences, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Human Environmental Sciences, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

137 Stanley Hall  
882-7224

**Director of Graduate Studies:** Sandy Rikoon

- PhD in Human Environmental Sciences (p. 512)
  - with emphasis in Architectural Studies (p. 512)
  - with emphasis in Human Development and Family Studies (p. 513)
  - with emphasis in Human Nutrition Foods and Food Systems Management (p. 514)
- with emphasis in Personal Financial Planning (p. 514)
- with emphasis in Textile and Apparel Management (p. 515)

## Graduate

### PhD in Human Environmental Sciences

Students are required to pick an emphasis area to obtain the PhD in Human Environmental Sciences. Please see the individual emphasis degree requirement pages (p. 512) for more information.

### PhD in Human Environmental Sciences with Emphasis in Architectural Studies

#### Admission Contact Information

Dr. Ronn Phillips (phillipsr@missouri.edu)  
137 Stanley Hall; Columbia, MO 65211  
573-882-4575

#### Admission Criteria

Fall deadline: February 1  
Spring deadline: October 1  
Minimum GPA: 3.0

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

#### Required Application Materials

To the Graduate School:

- All required Graduate School documents
- Statement of graduate goals and educational objectives discussing: which of the department's emphasis areas of interest; intentions regarding PhD; and request for a specific adviser (upload to online application)

To the Architectural Studies Program:

- Departmental application
- 3 letters of recommendation (excluding MU Architectural Studies faculty). Can be uploaded to the online Graduate School application or mailed directly to the program.

#### Doctor of Philosophy

The Doctor of Philosophy (PhD) degree is designed for individuals who are interested in acquiring the knowledge and skills that are needed to conduct substantive, innovative, and original research that contribute to the theoretical and methodological foundation of architecture and interior design, and the dissemination of this research through teaching, publication, and practice. To this end, the curriculum is structured so that students move gradually from overview of architectural research to the identification and pursuit of major and minor areas of specialization and, finally, to highly specialized original dissertation research. This framework



promotes stimulating intellectual discourse among individuals with varying research philosophies and interests.

In order to pass examination, and thus qualify as the basis for the award of the PhD degree, the dissertation should have the following attributes:

- It demonstrates authority in the candidate’s field and shows evidence of command of knowledge in relevant fields;
- It shows that the candidate has a thorough grasp of the appropriate methodological techniques and an awareness of limitations;
- It makes a distinct contribution to knowledge because of the originality of the approach and/or interpretation of the findings and, in some cases, the discovery of new facts;
- It demonstrates an ability to communicate research findings effectively in the professional arena and in an international context;
- It is a careful, rigorous and sustained piece of work demonstrating that a research “apprenticeship” is complete and the holder should be admitted to the community of scholars in the discipline.

Doctoral study in Architectural Studies, College of Human Environmental Sciences, is research-based and expands knowledge in the “major” areas of either environment and behavior or design with digital media. The major area is defined as that area of specialization in the doctoral program within which the student is expected to write his/her dissertation.

Students will choose a “supportive cognate area” which is intended to reinforce the development of an understanding of the discipline. Supporting cognate area courses are selected from a broad spectrum of disciplines providing students with the opportunity to design an individualized program of study that capitalizes on their unique interests and talents.

## PhD Requirements

The University of Missouri requires a minimum of 72 semester hours beyond the baccalaureate degree for the PhD. The doctoral program committee provides departmental approval of the student’s plan of study (Form D-2), a list of the courses and the credit to be earned in each of them, which will, when completed:

- Prepare the student for research or scholarly investigation in the chosen field of study.
- Satisfy the credit-hour and residency requirement of the department.
- Satisfy any special requirements (collateral field, other special research skills) imposed by the department.
- Satisfy the Graduate School’s requirement for a minimum of 15 hours of course work at the 8000/9000 level (exclusive of research, problems and independent study experiences).

The committee also recommends to the vice provost/dean, as part of the plan of study, any request for transfer of graduate credit. The student must substantially complete the course work outlined in the plan of study to the satisfaction of the doctoral program committee and the Graduate School before being declared ready for the comprehensive examination.

The PhD is a research-based plan of study leading to the written doctoral dissertation. The dissertation is distinctive because it demonstrates the ability to conceive of and execute scholarly research, and it makes a contribution of new knowledge to the discipline. Research is conducted in one of the two interest areas — environment and behavioral studies or design with digital media. Specific course work is chosen based on subject matter and the type of research method selected— quantitative, qualitative or a combination of both.

PhD students must complete a final oral examination by an approved faculty committee and submit a presentation proposal at a professional conference or a manuscript in a professional journal.

## PhD in Human Environmental Sciences with Emphasis in Human Development and Family Studies

### Admission Contact Information

Marilyn Coleman colemanma@missouri.edu  
314 Gentry; Columbia, MO 65211  
573-882-4360

The Department of Human Development and Family Studies emphasis in the Human Environmental Sciences PhD degree prepares students for careers in research, college or university teaching, or leadership positions in public and private human service institutions.

### Admission Criteria

Fall deadline: December 15

Spring deadline: November 15

Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)	
61	500	
• Minimum GRE scores:		
When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	50th percentile	50th percentile
On or After August 1, 2011	50th percentile	50th percentile

\* Some exceptions are made.

- Minimum GPA: 3.0 for last 60 hours

### Required Application Materials

*Submit via the apply yourself system*

- Application form
- 3 letters of recommendation from people who can speak to applicant’s potential to do graduate work (e.g., professors, advisors).
- GRE score (and TOEFL score for international applicants)
- Personal statement
- Resume or Curriculum Vitae
- Official Transcripts

### Plan of Study

Students selecting the doctoral degree work with members of their doctoral committee to create an individualized plan of study tailored to their specific research interests. Over the course of their degree program all doctoral students are required to enroll in six credit hours of research practicum, three credit hours of teaching practicum, and complete coursework in theory, research methods, statistics, and their collateral area. In addition, all doctoral students complete a minimum of 12 credit hours of research for their dissertation. A sample plan of study can be found on the HDFS website (<http://hdfs.missouri.edu/>).

## Qualifying Process for Doctoral Students

To be officially admitted to the HDFS doctoral program, students generally must have completed a master's degree in HDFS or a related field, although exceptions are granted.

## Satisfactory Progress

Satisfactory progress is based on the student maintaining a sufficient GPA according to the student's program or funding guidelines and completing all degree forms and milestones according to departmental timelines. For a detailed description of the department's description of a satisfactory rate of academic progress, please refer to the HDFS Graduate Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## PHD Comprehensive Matriculation Exam

The comprehensive exam consists of two parts. Part I involves an in-house written and oral examination over

1. theory, methods, and statistics,
2. the student's area of specialization and core content, and
3. the student's collateral area.

The advisor is responsible for collecting questions from all five committee members, constructing the exam, and getting approval for the final version of the exam from available committee members. It is expected that the written exam will take the student no longer than 8 hours (e.g., two half-days or one full day) to complete. The written exam will be assessed by the committee and the student will meet with the committee for an oral defense of the written exam. If this part of the exam is passed the student moves to Part II of the comprehensive exam, which involves writing a grant pre-proposal and, if approved, a full grant proposal as outlined in the HDFS Graduate Handbook. For a detailed description of the comprehensive exam timeline please refer to the Handbook found on the HDFS website (<http://hdfs.missouri.edu/>).

## Admission to Candidacy

After students pass Parts I and II of the comprehensive examination, they complete the D3 form to apply to the Division of Graduate Studies for admission to doctoral candidacy. Following admission to candidacy, students complete a prospectus for the dissertation project. The prospectus includes a pertinent review of the literature, statement of the problem, the purpose of the proposed study, description of the research design, and discussion of the specific means by which the data will be analyzed. Subsequently, the dissertation committee will meet to evaluate, request revisions to, and approve the student's dissertation prospectus.

## Time Limits on Degree Completion

A graduate degree represents current knowledge of the field as of the date the degree is granted. Limitations have therefore been set regarding the number of years to finish the degree. Doctoral students have 6 years in which to complete degree requirements. The clock starts the semester that the first class beyond the master's degree is taken. The comprehensive exam must be completed no later than by the end of the fourth year of study. HDFS doctoral students have only three years after passing the comprehensive examination to complete the doctoral degree.

## Petitions for Extension

On petition of the candidate, an extension of 1 year may be granted by the HDFS graduate faculty. The student may petition for no more than

two one-year extensions. Therefore, a doctoral student may have no more than 5 years, including two one-year extensions, to complete the doctoral degree after passing the comprehensive exam. On petition of the candidate and the candidate's department, an extension of this time limit may be granted by the Graduate School.

## PhD in Human Environmental Sciences with Emphasis in Human Nutrition Foods and Food Systems Management

The department is not currently accepting applicants for this degree program emphasis. Contact the department (p. 512) for further information.

## PhD in Human Environmental Sciences with Emphasis in Personal Financial Planning

College of Human Environmental Sciences  
239 Stanley Hall  
573-882-7836  
<http://pfp.missouri.edu/>

The doctoral program is designed to develop skill in the evaluation and generation of research that advances the disciplines engaged in Personal Financial Planning, such as Personal Finance, Family Economics, Consumer Economics, Corporate Finance, Law, among others. This program prepares students for careers in university research and teaching, government, Extension, or public policy evaluation.

## Application Deadlines

Fall deadline: February 1  
Spring deadline: October 1

## Admission Criteria

- Minimum TOEFL scores (for ESL applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GPA: 3.0 in last 60 hours

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- 3 letters of recommendation
- GRE scores (or GMAT for Applied MS in Personal Financial Planning)
- Statement of Purpose
- Official transcripts

# PhD in Human Environmental Sciences with emphasis in Textile and Apparel Management

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## Admission Contact Information

Leona Nichols (nicholslm@missouri.edu)  
137 Stanley Hall; Columbia, MO 65211  
573-882-7317  
[http://tam.missouri.edu/academics\\_grad.html](http://tam.missouri.edu/academics_grad.html)

## Application Deadlines

Fall deadline: February 1 (January 15 for early financial support considerations)

Spring deadline: June 1

Summer deadline: October 1

## Admission Criteria

- Minimum GPA: 3.0 in last 60 hours
- Bachelor's degree from an accredited college or university in textile and apparel management or related field. Those with unrelated majors will need to do make-up work
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	N/A
On or After August 1, 2011	153/144	variable

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- Statement of professional objectives (upload to application)
- Departmental application (upload through the Graduate School application or send directly to department)
- Three letters of recommendation (upload preferred, or send directly to department)
- GRE Scores
- TOEFL scores if international student

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

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## Nutrition and Exercise Physiology

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**Department Chair:** Christopher Hardin

340 H Life Science Building

(573) 882-4288

hardinc@missouri.edu

<http://ns.missouri.edu>

**Nutrition and Exercise Physiology Office**

106 McKee

(573) 882-7316

Fax: (573) 884-4885

**Director of Graduate Studies - Exercise Physiology**

Jill Kanaley

117 Tucker Hall

(573) 882-2519

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<http://ns.missouri.edu>

**Director of Graduate Studies - Nutritional Sciences**

Pamela Hinton

124 McKee

(573)882-4137

hintonp@missouri.edu

**Admission Contact Information**

Tammy Conrad

106 McKee

Columbia, MO 65211

573-882-1144

conradt@missouri.edu

## Faculty

**Professor** C. D. Hardin\*\*, J.A. Kanaley\*\*

**Associate Professor** S. Ball\*\*, S. Gable\*\*, P. S. Hinton\*\*, C. A. Peterson\*\*, J. Thyfault\*\*

**Assistant Professor** P. M. Landhuis\*, H. Leidy\*\*, R. S. Rector\*\*, V. Vieira-Potter\*

**Teaching Associate Professor** D.E. Brigham\*

**Teaching Assistant Professor** M. Raedeke\*

**Joint Faculty** M. J. Petris\*\*, L. Pulakat\*\*

**Adjunct Faculty** F. W. Booth\*, K. L. Fritsche\*\*, L. Hillman\*, Jamal A. Ibdah\*\*, D. Lubahn\*\*, G.Y. Sun\*\*, G.A. Weisman\*\*

**Adjunct Instructor** J.B. Mann, L. Hudson, T. Roberts, J. Schnell, R. Sharp, D. Showers, D. Smith

**Extension Faculty** J. Britt-Rankin\*, A. Cohen, C. Gabel, E.R. Schuster

**Professor Emeritus** R. P. Dowdy\*, Mary McDonald, Boyd L. O'Dell, T. R. Thomas\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

# Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

While MU does not offer undergraduate degrees specifically in exercise physiology, the University does offer baccalaureate opportunities in a number of related areas, both within the College of Human Environmental Sciences, and in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (<https://nextcatalog.missouri.edu/degreesanddegreeprograms>).

## Graduate

- MS in Nutrition and Exercise Physiology (p. 516)
  - with emphasis in Nutritional Sciences (p. 518)
  - with emphasis in Exercise Physiology (p. 516)

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## Graduate

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### MS in Nutrition and Exercise Physiology

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The MS in Nutrition and Exercise Physiology has two emphasis areas. Please see the emphasis area pages in Nutritional Sciences (p. 518) and in Exercise Physiology (p. 516) for degree information.

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### MS in Nutrition and Exercise Physiology with emphasis in Exercise Physiology

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**Director of Graduate Studies - Exercise Physiology**

Jill Kanaley

117 Tucker Hall

(573) 882-2519

kanaleyj@missouri.edu

<http://ns.missouri.edu>

**Admission Contact Information**

Tammy Conrad

106B McKee

Columbia, MO 65211

573-882-1144

conradt@missouri.edu

## About the Program

The Nutritional Sciences Graduate Program in Exercise Physiology is designed to provide advanced training in both the basic and applied aspects of exercise, physical activity and physical inactivity. Currently, the research focus is to examine the mechanisms by which physical activity levels and/or exercise modulate risk and development of obesity, type 2 diabetes, and overall metabolic and cardiovascular diseases using both animal models and human subjects, and to be able to translate the findings into the clinical or applied setting. Graduate students will receive training in laboratory research, seminar preparation, scientific writing, problem solving and grant writing. Graduate studies at the University of Missouri offer the advantage of interdisciplinary exercise research that is facilitated by numerous collaborations at the many research centers at MU. In addition, the Exercise Physiology research program

collaborates closely with other units on campus including the Department of Biomedical Sciences in the Vet School, and the Departments of Internal Medicine and Medical Pharmacology and Physiology in the School of Medicine among others.

The Exercise Physiology Graduate Program offers both MS and PhD degrees. These exercise physiology degrees are designed to prepare students for careers in exercise physiology or exercise physiology/nutrition. The curriculum has a scientific basis with core courses in exercise physiology, nutrition, biochemistry, and physiology. Teaching and research assistantships are available on a competitive basis.

## Areas of Research

Exercise physiology is a multidisciplinary program that integrates other disciplines such as biochemistry, nutrition, physiology, and biology. The primary focus of this department is prevention and treatment of chronic disease focusing primarily on physical activity/exercise, as well as considering nutrition. Current research focus of the faculty include: obesity, the metabolic syndrome, diabetes, physical inactivity, glucose control and intrahepatic fat accumulation.

## Research Facilities

The Nutrition and Exercise Physiology Department has an [Exercise Physiology Laboratory](#) (Lab) that is located in McKee Gym within the Department of Nutrition and Exercise Physiology. The Lab is a 4200 sq. ft. multi-room facility, with a large exercise testing room and associated smaller rooms for body composition assessment and other purposes. This space also enables us to do clinical testing such as repeated blood sampling on multiple subjects. Our facility also has a chemistry laboratory dedicated to blood handling and chemical analyses. Additionally there is a dedicated fitness center for supervised exercise training sessions.

## MS Admission Criteria

Deadline for Fall entrance: Dec 30

- Prerequisites: general and organic chemistry, physiology (5 h), anatomy, nutrition, kinesiology, exercise physiology
- Minimum 3.0 undergraduate GPA (4.0=A)
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	500

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1000 3.5
On or After August 1, 2011	150 3.5

## Required Application Materials

To the Graduate School (210 Jesse Hall; Columbia, MO 65211):

All required Graduate School documents, including on line application

Required Supplementary Application Materials for the Program (upload online with your application to the Graduate School)

- Statement of Purpose: Upload a Statement of Purpose, indicating your academic/research interests and career goals to the "Supplemental Information" section of your online application.
- Resume or Vita: Upload a current Resume or Vita to the "Supplemental Information" section of your online application.

- Recommendations: Enter the required information for at least three recommenders in the "Recommendation" section of your online application. The recommenders will receive an email with instructions for completing and submitting your recommendation. Please ensure that the recommenders are aware of the Dec 30 application deadline.
- GRE Scores: Please make arrangements with Educational Testing Services to have official Graduate Record Exam (GRE) scores sent directly to our department. MU's Institutional code is 6875 and our department code: 0214.

## Financial Aid from the Program

No additional materials are required to be considered for an assistantship.

## Plan of Study

The core program consists of 23 hours of course work including a research project (3 hours) and a formal research thesis (4 hours). See the courses section for more information.

### Course List

#### Prerequisites

HTH_PR 4250	Human Kinesiology	3
CHEM 1320 & CHEM 2030 & CHEM 2130	College Chemistry I and Survey of Organic Chemistry and Organic Laboratory I (plus Organic)	9 hrs
PTH_AS 2201	Human Anatomy Lecture	3
MPP 3202	Elements of Physiology	5
or MPP 3333 & MPP 3337	Fundamentals of Human Physiology and Human Physiology Laboratory	
NUTR_S 2340	Human Nutrition I	3
NUTR_S 4850	Physiology of Exercise	3

#### Core Graduate Courses

ESC_PS 8630	Qualitative Methods in Educational Research I	3
ESC_PS 8840	Quantitative Analysis in Educational Research II	3
NUTR_S 7085	Problems in Nutritional Sciences	1
NUTR_S 7340	Human Nutrition II Lecture (biochem. prereq.)	3
NUTR_S 7500	Research in Nutritional Sciences	3
NUTR_S 7970	Sports Nutrition	2
NUTR_S 8090	Masters Research in Nutritional Sciences	4
NUTR_S 8850	Advanced Exercise Physiology	3

#### Suggested Electives (14 hours)

NUTR_S 7001	Topics in Nutritional Science (Etiology of Obesity)	3
NUTR_S 7200	Sports Performance and Conditioning	3
NUTR_S 7330	Human Nutrition II Laboratory	2
NUTR_S 7840	Cardiovascular Health and Fitness	3
NUTR_S 8030	Etiology of Obesity	3
NUTR_S 8310	Nutritional Biochemistry of Lipids	3
NUTR_S 8340	Nutrition in Human Health	3
NUTR_S 8870/ MPP 9431	Exercise Metabolism	3
BIOCHM 7270	Biochemistry	3
BIOCHM 7274	Biochemistry Laboratory	5
V_BSCI 8420	Veterinary Physiology	5

V\_BSCI 9435 Skeletal Muscle 3  
 Select to give 36 hours total

## Reasonable Rate of Progress

At the end of each year the adviser will evaluate each master's student. Master's students must maintain a 3.0 GPA. In addition, each graduate student must maintain adequate research progress as judged by the adviser and/or graduate committee. Inadequate progress will result in a probationary period of 30 days to 1 semester.

## Masters Thesis

A written thesis, based upon original research, that is student's own work and that demonstrates a capacity for research and independent thought is required. In addition, the graduate student must present their thesis research in a seminar that is open to the general faculty and successfully defend their thesis to their committee.

## Reasonable Rate of Progress

Each graduate student must complete the Annual Review Requirement by updating information in the Graduate Student Progress System. At the end of each year the adviser will evaluate each master's student. Each student must maintain a 3.0 GPA. In addition, each graduate student must maintain adequate research progress as judged by the adviser and/or graduate committee. Inadequate progress will result in a probationary period of 30 days to 1 semester.

## Length of Study Policy

The program for the master's degree MUST be completed within a period of three (3) years beginning with the first semester of enrollment in which the student is accepted to a degree program. Time spent in the armed services will not count toward the three (3)-year limit (see Graduate School Active Duty Policy). For any extension of this time limitation, the student must petition their faculty advisor/mentor and the academic program's director of graduate studies in writing prior to the end of the 5th semester of enrollment in the program. The director of graduate studies will notify the adviser in writing of the decision.

In addition, the Department of Nutrition and Exercise Physiology is also currently building the Missouri University Nutritional Center for Health (MUNCH), a metabolic kitchen and research space designed for nutritional studies focused on adult and childhood obesity in Gwynn Hall, and is scheduled for completion in September 2014. The Exercise Physiology Laboratory and the MUNCH facility will provide a unique, integrated platform to examine the effects of exercise and diet on obesity and chronic disease.

Further the University of Missouri Health Care Hospital and Clinics (MUHC) are located a few blocks from McKee, and houses the MU Institute of Clinical and Translational Sciences (MU-ICTS). This facility has a recently renovated Clinical Research Unit (CRU) which allows for more outpatient clinical studies.

## MS in Nutrition and Exercise Physiology with emphasis in Nutritional Sciences

Admission Contact Information  
 Tammy Conrad conradt@missouri.edu  
 106 McKee; Columbia, MO 65211

573-882-4136

## Application Deadline

Fall admission: December 31 for the MS and PhD programs

## Admissions Criteria for the MS and PhD Programs

### Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	500	500	3.5
On or After August 1, 2011	150	150	

Minimum GPA: 3.0 in science and math classes

## Prerequisites

Entering students are expected to have undergraduate training (lecture and laboratory courses) in general and organic chemistry and biology, a two-semester course in biochemistry, and an upper-level human nutrition course.

## Required Application Materials

*To the Graduate School*

- All required Graduate School documents, including on line application *Required Supplementary Application Materials* (upload online with your application to the Graduate School)
- Statement of Purpose: Upload a Statement of Purpose, indicating your academic/research interests and career goals to the "Supplemental Information" section of your online application.
- Résumé or Vita: Upload a current Resume or Vita to the "Supplemental Information" section of your online application.
- Recommendations: Enter the required information for at least three recommenders in the "Recommendation" section of your online application. The recommenders will receive an email with instructions for completing and submitting your recommendation. Please ensure that the recommenders are aware of the February 1 application deadline.
- GRE Scores: Please make arrangements with Educational Testing Services to have official Graduate Record Exam (GRE) scores sent directly to our department. MU's Institutional code is 6875 and our department code: 0214.

## MS Degree Completion Requirements

The master of science degree is awarded in part for the completion of a thesis. The minimum department course requirements for the master of science degree are:

NUTR_S 7340	Human Nutrition II Lecture	3
BIOCHM 7270 & BIOCHM 7272	Biochemistry and Biochemistry	6

NUTR_S 8310	Nutritional Biochemistry of Lipids	3
NUTR_S 8340	Nutrition in Human Health	3
AN_SCI 9442	Vitamins and Minerals	4
	Statistics	6
NUTR_S 8087	Masters Seminar in Nutritional Sciences	1
NUTR_S 8090	Masters Research in Nutritional Sciences	4
Total Credits		30

A total of >30 hours of credit beyond the bachelor's degree are required, of which 15 credits must be at the 8000 or 9000 level; no more than 40 percent of the 30-hour credit requirement can be satisfied by a combination of special investigations, Research, Readings and / or Problems courses.

### Masters Thesis

A written thesis, based upon original research, that is student's own work and that demonstrates a capacity for research and independent thought is required. In addition, the graduate student must present their thesis research in a seminar that is open to the general faculty and successfully defend their thesis to their committee.

### Reasonable Rate of Progress

Each graduate student must complete the Annual Review Requirement by updating information in the Graduate Student Progress System. At the end of each year the adviser will evaluate each master's student. Each student must maintain a 3.0 GPA. In addition, each graduate student must maintain adequate research progress as judged by the adviser and/or graduate committee. Inadequate progress will result in a probationary period of 30 days to 1 semester.

### Length of Study Policy

The program for the master's degree MUST be completed within a period of three (3) years beginning with the first semester of enrollment in which the student is accepted to a degree program. Time spent in the armed services will not count toward the three (3)-year limit (see Graduate School Active Duty Policy). For any extension of this time limitation, the student must petition their faculty advisor/mentor and the academic program's director of graduate studies in writing prior to the end of the 5th semester of enrollment in the program. The director of graduate studies will notify the adviser in writing of the decision.

## Nutritional Sciences

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### Department Chair

Christopher Hardin  
204 Gwynn Hall  
(573) 882-4288  
hardinc@missouri.edu  
<http://ns.missouri.edu>

### Emphasis areas and Program Directors

Dietetics: Nikki Raedeke raedekem@missouri.edu  
Nutrition and Fitness: Jill Kanaley kanaleyj@missouri.edu  
Nutritional Sciences (pre-med) or Minor: Catherine Peterson  
petersonca@missouri.edu

### Advising Contact

Tammy Conrad  
204 Gwynn Hall  
(573) 882-1144  
conradt@missouri.edu

### HES Student Service Office

Victoria Shahan  
106 Gwynn Hall  
(573) 882-6424  
hesstudentservices@missouri.edu  
<http://hes.missouri.edu>

### Scholarship Contact

Nancy Schultz  
122 Gwynn Hall  
(573) 882-5142  
hesdevelopment@missouri.edu

## Faculty

**Professor** C. D. Hardin\*\*, J. A. Kanaley\*\*

**Associate Professor** S. Ball\*\*, S. Gable\*\*, P. S. Hinton\*\*, C. A. Peterson\*\*, J. Thyfault\*\*

**Assistant Professor** P. M. Landhuis\*, H. Leidy\*\*, R. S. Rector\*\*, V. Vieira-Potter\*

**Teaching Associate Professor** D. E. Brigham\*

**Teaching Assistant Professor** M. Raedeke\*

**Joint Faculty** M. J. Petris\*\*, L. Pulakat\*\*

**Adjunct Faculty** F. W. Booth\*, K. L. Fritsche\*\*, L. Hillman\*, J. A. Ibdah\*\*, D. Lubahn\*\*, G. Y. Sun\*\*, G. A. Weisman\*\*

**Adjunct Instructor** L. Hudson, J. B. Mann, T. Roberts, J. Schnell, R. Sharp, D. Showers, D. Smith

**Extension Faculty** J. Britt-Rankin\*, A. Cohen, C. Gabel, E. R. Schuster  
**Professor Emeritus** R. P. Dowdy\*, M. McDonald, B. L. O'Dell, T. R. Thomas\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 520)
- BSHES in Nutritional Sciences (p. 521)
  - with emphasis in Medical Dietetics (p. 521)
  - with emphasis in Nutrition and Fitness (p. 522)
  - with emphasis in Nutritional Sciences (p. 523)
- Minor in Nutritional Sciences (p. 524)

The program leading to the BS in Human Environmental Sciences with a major in Nutritional Sciences offers designated emphasis areas in medical dietetics, nutrition and fitness, and nutritional sciences. A minor is also available in nutritional sciences. The department administers graduate programs in nutritional sciences and exercise physiology.

Students who want to explore the major can take NUTR\_S 1034 Nutrition, Current Concepts and Controversies or NUTR\_S 1340 Introduction to Exercise and Fitness.

## Graduate

Information on our graduate degrees can be found under the following listings:

Nutrition Area Program (p. 622) (PhD in Nutritional Sciences)

Nutrition and Exercise Physiology (p. 516) (Masters programs in Nutritional Science and Exercise Physiology)

Exercise Physiology (p. 500) (PhD in Exercise Physiology)

The catalog provides a complete list of degree options (p. 5) at the University of Missouri.

## Undergraduate

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## Department Level Requirements - Nutritional Sciences

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The department has a set GPA requirement for students entering each program. The specific requirements can be found on our department website <http://ns.missouri.edu>

Dietetics - Admission is competitive and application requirements include a minimum cumulative grade point average of 3.2 on a 4.0 scale and completion of the following prerequisite courses: 15-20 hours of general education requirements, human physiology with laboratory, organic chemistry with laboratory, biochemistry, basic nutrition with physiology and chemistry prerequisites, and food preparation with chemistry prerequisite.

Nutrition and Fitness - students may transfer into the program as pre-N&F, but will be unable to take the upper level courses until they advance into the program. To advance, a student must earn a minimum 2.65 CUM GPA after 30 credit hours, including completion of CHEM 1320, BIO\_SC 1010/BIO\_SC 1020 or BIO\_SC 1500, MATH 1100 or equivalent, NUTR\_S 1340 and Physiology (MPP 3202 or MPP 3333/MPP 3337) or Anatomy (PTH\_AS 2201). These classes required a C or better.

Nutritional Sciences (pre\_Med)- to enter the Nutritional Sciences Program, students are required to have a minimum GPA of 2.65 and



be enrolled in at least one required biology, chemistry, physics, or biochemistry course OR one required course per semester to be eligible.

## BSHES in Nutritional Sciences

### Major Program Requirements

The BSHES in Nutritional Sciences is offered with three emphasis options: Medical Dietetics, Nutrition and Fitness, and Nutritional Sciences. All degree requirements are listed at the emphasis level.

### Semester Plan

Refer to the Semester Plans in the emphasis areas.

## BSHES in Nutritional Sciences with Emphasis in Medical Dietetics

### Major Program Requirements

The Coordinated Program in Dietetics combines academic course work with supervised practice in healthcare and other practice settings. Enrollment is limited to a maximum of 15 students per year. To apply, students must have completed (or be enrolled in) prerequisite courses and have a GPA of at least 3.2. Students must achieve a course grade of "B-" or better in BIOCHM 3630, or equivalent transfer courses approved by faculty.

Graduates are eligible to take the Registration Examination for Dietitians, which is required to obtain the RD (Registered Dietitian) credential. The program is accredited by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics. For additional information, please go to <http://ns.missouri.edu/>.

Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

### Emphasis Core Requirements

#### Pre-Professional Requirements

BIO_SC 1010 & BIO_SC 1020 or BIO_SC 1500	General Principles and Concepts of Biology and General Biology Laboratory (and) Introduction to Biological Systems with Laboratory	5
CHEM 1320	College Chemistry I	4
CHEM 2030 & CHEM 2130	Survey of Organic Chemistry and Organic Laboratory I (and)	5
BIOCHM 3630	General Biochemistry	3
HSP_MGMT 1991	Food Service Sanitation Management	1
HSP_MGMT 1995	Culinary Fundamentals	3
MANGMT 3000	Principles of Management	3
MPP 3202	Elements of Physiology	5
NUTR_S 2340	Human Nutrition I	3
PSYCH 1000	General Psychology	3
SOCIOL 1000 or RU_SOC 1000	Introduction to Sociology Rural Sociology	3

STAT 1400	Elementary Statistics for Life Sciences	3
or ESC_PS 4170	Introduction to Applied Statistics	

#### Area of Competence

F_S 4310	Food Chemistry and Analysis	4
NUTR_S 2450	Nutrition Throughout the Life Span	3
NUTR_S 3280	Food Service I: Introduction to Food Service	3
NUTR_S 3290	Food Service I: Supervised Practice Experience	1
NUTR_S 3360	Nutritional Assessment Supervised Practice Experience	2
NUTR_S 3370	Nutrition Therapy I: Supervised Practice Experience	3
NUTR_S 3390	Teaching and Counseling Techniques in Nutrition	2
NUTR_S 3400	Teaching & Counseling Techniques in Nutr. Supervised Practice Exp	1
NUTR_S 3590	Community Nutrition Supervised Practice Experience	1
NUTR_S 4001	Topics in Nutrition and Exercise Physiology (Professional Development I)	1
NUTR_S 4280	Food Service II: Advanced Food Service Management	1
NUTR_S 4290	Food Serv. II: Adv. Food Service Manage. Supervised Practice Exp	2
NUTR_S 4340	Human Nutrition II Lecture	3
NUTR_S 4360	Nutritional Assessment	3
NUTR_S 4370	Nutrition Therapy I	3
NUTR_S 4380	Nutrition Therapy II	2
NUTR_S 4381	Nutrition Therapy II: Supervised Practice Experience	4
NUTR_S 4390	Issues in Dietetic Practice	1
NUTR_S 4590	Community Nutrition	3
NUTR_S 4950	Capstone: Research in Nutritional Sciences	2
NUTR_S 4951	Nutrition Research Communication	1
NUTR_S 4975	Practice of Dietetics Supervised Practice Experience	10

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year				
Fall	Credits	Spring	Credits	
GN_HES 1100	1	ENGLISH 1000	3	
BIO_SC 1500 or 1010 and 1020	5	CHEM 1320	4	
MATH 1100	3	SOCIOL 1000 or RU_SOC 1000	3	
HES Foundation Course	3	HIST or POL_SC course	3	

PSYCH 1000	3	HSP_MGMT 1991	1		
	15		14		
<b>Second Year</b>					
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>		
CHEM 2030	3	COMMUN 1200 or 3571	3		
CHEM 2130	2	MANGMT 3000	3		
MPP 3202	5	BIOCHM 3630	3		
HSP_MGMT 1995	3	NUTR_S 2340	3		
Humanities	3	HES Foundation Course (strongly recommend FINPLN 2183)	3		
	16		15		
<b>Third Year</b>					
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>	<b>Summer</b>	<b>Credits</b>
NUTR_S 4360	3	NUTR_S 3280	3	ESC_PS 4170	3
NUTR_S 3360	2	NUTR_S 3290	1	NUTR_S 4590	3
NUTR_S 3390	2	NUTR_S 4370	3		
NUTR_S 3400	1	NUTR_S 3370	3		
F_S 4310	4	NUTR_S 2450	3		
NUTR_S 4340	3	Humanities (WI)	3		
	15		16		6
<b>Fourth Year</b>					
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>		
NUTR_S 3590	1	NUTR_S 4951	1		
NUTR_S 4950	2	NUTR_S 4390	1		
NUTR_S 4280	1	NUTR_S 4975	10		
NUTR_S 4290	2				
NUTR_S 4380	2				
NUTR_S 4381	4				
NUTR_S 4001	1				
	13		12		
Total Credits: 122					

## BSHES in Nutritional Sciences with Emphasis in Nutrition and Fitness

### Major Program Requirements

Graduates of this program are prepared for employment in the fitness and health promotion area or for graduate studies in exercise science. This is a rapidly expanding area with opportunities in corporate and commercial industries, government and non-profit sectors. Typical employment responsibilities include fitness assessment, nutrition education, health promotion, exercise supervision and program administration.

Students desiring to declare Nutrition and Fitness as a major are required to have earned a minimum overall GPA of 2.65 after 30 credit hours, including completion of the following courses or their equivalents with a minimum grade of "C":

BIO_SC 1010	General Principles and Concepts of Biology	5
& BIO_SC 1020	and General Biology Laboratory	
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
CHEM 1320	College Chemistry I	4
MATH 1100	College Algebra	3
NUTR_S 1340	Introduction to Exercise and Fitness	3
MPP 3202	Elements of Physiology	5
PTH_AS 2201	Human Anatomy Lecture	3

Prior to achieving these requirements, students will be considered "Pre-Nutrition and Fitness" and are not eligible to take upper-level Nutrition and Fitness courses. Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

### Science Foundation

BIO_SC 1010	General Principles and Concepts of Biology	5
& BIO_SC 1020	and General Biology Laboratory	
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
CHEM 1320	College Chemistry I	4
CHEM 2030	Survey of Organic Chemistry	3
CHEM 2130	Organic Laboratory I (recommended))	2
BIOCHM 3630	General Biochemistry	3
MPP 3202	Elements of Physiology	5
or MPP 3333	Fundamentals of Human Physiology	
& MPP 3337	and Human Physiology Laboratory	
PTH_AS 2201	Human Anatomy Lecture	3
PTH_AS 2203	Human Anatomy Laboratory (recommended))	2
STAT 1200	Introductory Statistical Reasoning	3
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or ESC_PS 4170	Introduction to Applied Statistics	

### Emphasis Core Requirements

#### Nutritional Sciences

NUTR_S 2340	Human Nutrition I	3
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NUTR_S 2450	Nutrition Throughout the Life Span	3
NUTR_S 4360	Nutritional Assessment	3
NUTR_S 4970	Nutrition Capstone: Sports Nutrition	2

#### Exercise Physiology

NUTR_S 1340	Introduction to Exercise and Fitness	3
NUTR_S 3800	Prevention and Care of Athletic Injury	3
HTH_PR 4250	Human Kinesiology	3
NUTR_S 4850	Physiology of Exercise	3
NUTR_S 4860	Exercise Prescription	3

#### Supporting Area

Choose 9 hours from selected courses in learning, teaching and curriculum, educational and counseling, nutritional sciences, human development and family studies or sociology.	9
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#### Electives to equal 120 credit minimum

Organic chem lab, anatomy lab and internships are available and highly recommended.	16
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## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
GN_HES 1100	1	ENGLSH 1000	3
MATH 1100	3	CHEM 1320	4
NUTR_S 1340	3	Humanities	3
BIO_SC 1500 or 1010 <i>and</i> 1020	5	Social/Behavioral Science	3
HES Foundation Course	3	American Government	3
	15		16
Second Year			
Fall	Credits	Spring	Credits
CHEM 2030	3	MPP 3202 or 3333 <i>and</i> 3337	5
CHEM 2130	2	BIOCHM 3630	3
PTH_AS 2201	3	NUTR_S 2340	3
PTH_AS 2203	2	Social/Behavioral	3
COMMUN 1200 or 3571	3		
Elective	2		
	15		14
Third Year			
Fall	Credits	Spring	Credits
NUTR_S 3800	3	NUTR_S 2450	3
Statistics Course	3	NUTR_S 4850	3
HES Foundation Course (WI)	3	Supporting Area	3
Humanities	3	Electives	6
Elective	3		
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
HTH_PR 4250	3	NUTR_S 4860	3
NUTR_S 4360	3	Supporting Area	3

NUTR_S 4970	2	Electives	9
Supporting Area	3		
Electives	4		
	15		15
Total Credits: 120			

## BSHES in Nutritional Sciences with Emphasis in Nutritional Sciences

### Major Program Requirements

This program of study provides a strong foundation in science with a focus on human nutrition. Graduates are prepared for advanced study in human nutrition, medicine, dentistry or other health-related careers. This program is an excellent choice for premedicine students with an interest in family practice or rural medicine.

To enter the nutritional sciences program, students are required to have a minimum overall GPA of 2.65 and be enrolled in at least one required biology, chemistry, physics, or biochemistry course or one required NUTR\_S course per semester.

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

#### Science Foundation

BIO_SC 1500	Introduction to Biological Systems with Laboratory	3-5
CHEM 1320	College Chemistry I	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	5
& CHEM 2130	and Organic Laboratory I (&)	
PHYSICS 1210	College Physics I	8-10
& PHYSICS 1220	and College Physics II (&)	
or PHYSICS 2750	University Physics I	
& PHYSICS 2760	and University Physics II	

#### Math and Statistics

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
or ESC_PS 4170	Introduction to Applied Statistics	
STAT 2500	Introduction to Probability and Statistics I	3
or ESC_PS 4170	Introduction to Applied Statistics	

#### Core Curriculum

NUTR_S 2340	Human Nutrition I	3
NUTR_S 2450	Nutrition Throughout the Life Span	3
NUTR_S 4330	Human Nutrition II Laboratory	2
NUTR_S 4340	Human Nutrition II Lecture	3
NUTR_S 4950	Capstone: Research in Nutritional Sciences	2
NUTR_S 4951	Nutrition Research Communication	1
BIOCHM 4270	Biochemistry	3
BIOCHM 4272	Biochemistry	3
BIO_SC 2200	General Genetics	4
BIO_SC 2300	Introduction to Cell Biology	4
MPP 3202	Elements of Physiology	5

MPP 3333	Fundamentals of Human Physiology	5
& MPP 3337	and Human Physiology Laboratory	
BIO_SC 3700	Animal Physiology	5

Choose a minimum of 5 hours from selected courses in biochemistry, chemistry, nutritional sciences or molecular microbiology and immunology

#### Electives to equal 120 credit minimum

Additional courses may be required to meet college requirements or career objectives. On-campus research internships are available and highly recommended.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
American Government	3	BIO_SC 1500	5
CHEM 1320	4	Elective	3
ENGLISH 1000	3	MATH 1700	5
GN_HES 1100	1	Social/Behavioral Science	3
MATH 1500	5		
	<b>16</b>		<b>16</b>
Second Year			
Fall	Credits	Spring	Credits
BIO_SC 2200	4	CHEM 2110	3
Elective	3	CHEM 2130	2
CHEM 2100	3	Elective	5
MPP 3202, 3333 <i>and</i> 3337, or BIO_SC 3700	5	NUTR_S 2340	3
		Social/Behavioral Science	3
	<b>15</b>		<b>16</b>
Third Year			
Fall	Credits	Spring	Credits
BIOCHM 4270	3	Humanities	3
HES Foundation Course	3	BIO_SC 2300	4
Humanities	3	BIOCHM 4272	3
PHYSICS 1210	4	PHYSICS 1220	4
STAT 2500	3		
	<b>16</b>		<b>14</b>
Fourth Year			
Fall	Credits	Spring	Credits
NUTR_S 4330	2	COMMUN 1200 or 3571	3
NUTR_S 4340	3	HES Foundation Course (WI)	3
NUTR_S 4950	2	NUTR_S 2450	3
Professional Electives	2	NUTR_S 4951	1
Electives	5	Professional Electives	3
	<b>14</b>		<b>13</b>
Total Credits: 120			

## Minor in Nutritional Sciences

The minor in nutritional sciences is intended for students majoring in biological sciences, biochemistry, health and exercise sciences or related fields. A minimum of 3 credit hours of organic chem and/or physiology are needed to take the required course NUTR\_S 2340 Human Nutrition I.

#### Minor core requirements

NUTR_S 2340	Human Nutrition I	3
Select 12 credits from the following approved nutrition courses:		12
NUTR_S 2380	Diet Therapy for Health Professionals	
NUTR_S 2450	Nutrition Throughout the Life Span	
NUTR_S 2460	Eating Disorders	
NUTR_S 3390	Teaching and Counseling Techniques in Nutrition	
NUTR_S 4330	Human Nutrition II Laboratory	
NUTR_S 4340	Human Nutrition II Lecture	
NUTR_S 4360	Nutritional Assessment	
NUTR_S 4370	Nutrition Therapy I	
NUTR_S 4380	Nutrition Therapy II	

Total Credits 15

## Personal Financial Planning

Robert O. Weagley, Chair  
College of Human Environmental Sciences  
241 Stanley Hall  
(573) 882-7836  
weagleyr@missouri.edu  
<http://pfp.missouri.edu>

### Advising Contact

Victoria Shahan  
106 Gwynn Hall  
(573) 882-6424  
hesstudentservices@missouri.edu  
<http://hes.missouri.edu>

### Scholarship Information Contact

Nancy Schultz  
122 Gwynn Hall  
(573) 882-5142  
hesdevelopment@missouri.edu

## Admissions

Students must have a University of Missouri cumulative GPA of at least a 2.5 (2.25 for Financial Counseling), based on at least 50 credits attempted, and a C (2.0) or better in FINPLN 2183 and FINPLN 3283 to be admitted to either the Personal Financial Planning or Financial Counseling professional programs of the department. Personal Financial Management Services cumulative GPA of at least a 2.0, based on at least 50 credits attempted, and a C (2.0) or better in FINPLN 2183 and FINPLN 3283. A grade in the D range is allowed in only one course in the professional program, regardless of emphasis area.

## Faculty

**Associate Professor** D. L. Sharpe\*\*, R. O. Weagley\*\*

**Assistant Professor** R. Yao\*\*, M. Guillemette\*

**Teaching Assistant Professor** S. Ivey, H. Zan\*

**Instructor** R. Law

**Extension Assistant Professor** L. Schrader, A. Zumwalt

**Extension Associate** G. McCaulley

**Emeritus Professor** E. Metzen, P. Lieurance

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 526)
- BSHES in Personal Financial Planning (p. 526)
  - with emphasis in Personal Financial Planning (p. 527)
  - with emphasis in Financial Counseling (p. 526)
  - with emphasis in Personal Financial Management Services (p. 527)
- Minor in Personal Financial Management Services (p. 528)

- Minor in Personal Financial Planning for Agricultural Economics majors (p. 528)
- Minor in Personal Financial Planning for Finance majors (p. 528)

## Graduate

Personal Financial Planning Graduate Programs  
College of Human Environmental Sciences  
239 Stanley Hall  
573-882-7836  
<http://pfp.missouri.edu/>

**Director of Graduate Studies:** Rui Yao

- MS in Personal Financial Planning (p. 529)
- Certificate in Personal Financial Planning (p. 529)

The College also offers a PhD in Human Environmental Sciences with an emphasis in either Personal Financial Planning (p. 514) or Consumer and Family Economics (p. 514).

## About the Program

Individuals and families today bear an ever-growing responsibility for achieving and sustaining financial and economic success across their life span. Never has there been a greater need for well-trained professionals who can help individuals and families make informed and effective financial and economic decisions. In addition, research that helps to evaluate and recommend public policies that influence the economic opportunities and futures of individuals and families is in high demand.

Graduate course work in Personal Financial Planning at the University of Missouri analyzes household and consumer economic conditions and behavior, evaluating the interrelationships between households and markets with a focus on improving social policy. Students' programs are designed to develop professional competencies and interests. A resident doctoral and two masters programs are available. Online graduate offerings may be viewed at [http://pfp.missouri.edu/graduate\\_distance.html](http://pfp.missouri.edu/graduate_distance.html).

## Certification Information

Degrees registered with the Certified Financial Planner Board of Standards Inc. include: a graduate Certificate in Personal Financial Planning; an Applied Master's Degree; and a joint JD/MS in cooperation with the School of Law.

Financial planning course work could also be completed as a doctoral program that is registered with the Certified Financial Planner Board of Standards Inc.

## Financial Aid

If you wish to be considered for internal assistantships, fellowships or other funding packages, check the program website or contact the director of graduates studies, Rui Yao ([yaor@missouri.edu](mailto:yaor@missouri.edu)) for details.

## Faculty Areas of Study

Students have opportunity to work closely with department faculty who are widely recognized professionals in various aspects of personal financial planning and consumer and family economics. Faculty research interests cover a broad spectrum of financial and economic issues, including, but not limited to college savings and affordability, retirement savings, health care financing, risk analysis, labor supply and household production choices, consumer behavior, consumer expenditure patterns,

consumer credit use, insurance demand, and low-income financial literacy.

## Contacts

Voronica Bonaparte, Department Contact  
 Robert O. Weagley, CFP Program Director  
 Rui Yao, Director of Graduate Studies  
 Deanna Sharpe, GPIDEA/Online Program  
 Starla Ivey, Professional Development Undergraduate Academic Advisor  
 Ryan Law, Director of the Office for Financial Success and Missouri Center for Economic Education

## Undergraduate

### Department Level Requirements - Personal Financial Planning

There are no requirements at the department level for this degree.

### BSHES in Personal Financial Planning

#### Major Program Requirements

The Department of Personal Financial Planning offers a major in Personal Financial Planning with three emphasis areas: Personal Financial Planning, Financial Counseling, and Personal Financial Management Services. In each option, the student must complete requirements for each phase of the degree program listed below:

- University general education requirements (p. 18)
- College of Human Environmental Sciences graduation requirements
- Major core courses
- Professional specialization

#### Major core requirements

FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3
FINPLN 4188	Community Agencies and Volunteerism	3
FINPLN 3287	Consumer and Household Economics I	3
FINPLN 4380	Assessing the American Dream	3

#### Social and Behavioral Sciences requirements

PSYCH 1000	General Psychology	3
SOCIOL 1000	Introduction to Sociology	1-3
ECONOM 1014	Principles of Microeconomics *	3
or AG_EC 1041	Applied Microeconomics	
ECONOM 1015	Principles of Macroeconomics *	3
or AG_EC 1042	Applied Macroeconomics	

Total Credits 23-25

\* Require a minimum grade of C (2.0).

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

### BSHES in Personal Financial Planning with Emphasis in Financial Counseling

#### Major Program Requirements

This emphasis prepares students to be financial counselors. Financial counselors require expertise in a variety of financial counseling and planning strategies, therefore students take a mix of classes in financial counseling, financial planning, human development and family studies (HDFS) and social work. This emphasis satisfies the academic requirements for the Accredited Financial Counselor (AFC) designation and allows the graduate to sit for the AFC exam, which is offered by the Association for Financial Counseling and Planning Education (AFCPE). Graduates must complete education requirements, pass the AFC exam, obtain professional experience and agree to adhere to the AFCPE code of ethics before being able to use the AFC mark.

Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

#### Professional specialization requirements

ACCTCY 2036	Accounting I	3
or ACCTCY 2010	Introduction to Accounting	
ECONOM 3229	Money, Banking and Financial Markets	3
FINPLN 3282	Financial Counseling	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 4187	Tax Planning	3
FINPLN 4382	Financial Planning: Risk Management	3
FINPLN 4383	Financial Planning: Investment Management	3
FINPLN 4993	Internship in Personal Financial Planning	3
H_D_FS 4610	Stress in Families	3
H_D_FS 4620	Family Interaction	3
H_D_FS 4630	The Process of Divorce	3
MANGMT 3540	Introduction to Business Law	3
MATH 1400	Calculus for Social and Life Sciences I	3
SOC_WK 2000	Exploration in Social and Economic Justice	3
SOC_WK 4710	Social Justice and Social Policy	3
STAT 1300	Elementary Statistics	3
or STAT 2500	Introduction to Probability and Statistics I	
Total Credits		48

# BSHES in Personal Financial Planning with Emphasis in Personal Financial Management Services

## Major Program Requirements

This emphasis prepares students for entry into a variety of positions that require expertise in the management of individual and family financial resources, combined with a specialized focus in a supportive area of study. Positions are available in a wide array of occupations.

Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

### Emphasis core requirements

MATH 1400	Calculus for Social and Life Sciences I	3
FINPLN 3282	Financial Counseling	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 4187	Tax Planning	3
FINPLN 4382	Financial Planning: Risk Management	3
FINPLN 4383	Financial Planning: Investment Management	3
ACCTCY 2036	Accounting I	3
or ACCTCY 2010	Introduction to Accounting	
ECONOM 3229	Money, Banking and Financial Markets	3
MANGMT 3540	Introduction to Business Law	3
STAT 1300	Elementary Statistics	3
or STAT 2500	Introduction to Probability and Statistics I	

### Professional specialization electives

These courses are selected by students from a list of approved courses to complement their degree. Suggested tracks are provided below. Each track represents nine of the eighteen required professional electives. Contact the Student Services Office of the College of Human Environmental Sciences or your departmental advisor to focus your additional credits in a specific area. (NOTE: Tracks will not appear on diploma or transcript.)

Total Credits 48

**Tracks:** Students may choose one cluster as nine hours of the eighteen hours of Professional Electives. Each cluster, when combined with the Supporting Course Requirements, meets the requirements for a minor in the College of Business, or Economics. Students are strongly encouraged to focus their remaining nine hours in course work that complements their sub-emphasis. At least one of these courses shall be at the 4000 level, or above.

### Real Estate Track

FINANC 3000	Corporate Finance	3
FINANC 4500	Principles of Real Estate	3
FINANC 4510	Real Estate Appraisal	3
or FINANC 4520	Real Estate Finance and Investment	
Additional Approved Credits		9

### Personal Investments Track

FINANC 3000	Corporate Finance	3
FINANC 4020	Investments	3

FINANC 4220	Portfolio Management	3
Additional Approved Credits		9

### Relationship Banking Track

FINANC 3000	Corporate Finance	3
FINANC 4030	Financial Intermediaries and Markets	3
FINANC 4130	Management of Financial Institutions	3
Additional Approved Credits		9

### Sales Marketing Track

MRKTNG 3000	Principles of Marketing	3
MRKTNG 4220	Consumer Behavior	3
MRKTNG 4380	Buying and Supply Chain Management	3
Additional Approved Credits		9

### Benefits Administration Track

MANGMT 3000	Principles of Management	3
MANGMT 4020	Human Resource Management	3
MANGMT 4210	Management Science	3
Additional Approved Credits		9

### Consumer Behavior Research Track

MRKTNG 3000	Principles of Marketing	3
MRKTNG 4050	Marketing Research	3
MRKTNG 4220	Consumer Behavior	3
Additional Approved Credits		9

### General Economics Track

ECONOM 3251	Theory of the Firm	3
ECONOM 4351	Intermediate Microeconomics	3
ECONOM 4353	Intermediate Macroeconomics	3
ECONOM 4325	The International Monetary System	3
Additional Approved Credits		9

### Generalist Track

Eighteen hours approved by the departmental advisor or other faculty member. At least nine of these hours must be at the 4000 level, or above.

## Semester Plan

A sample plan is not currently available. Contact the department for additional information.

# BSHES in Personal Financial Planning with Emphasis in Personal Financial Planning

## Major Program Requirements

The Personal Financial Planning emphasis is registered with the Certified Financial Planner Board of Standards. This emphasis satisfies the academic requirements for the Certified Financial Planner™ certification and allows the graduate to sit for the comprehensive CFP® certification examination. Graduates must complete education requirements, pass a national professional exam, obtain professional experience, and agree to adhere to the professional code of ethics before being able to use the CFP® marks.

Students must complete all university requirements, including general education (p. 18), in addition to the degree requirements below.

ACCTCY 2036	Accounting I	3
ACCTCY 2037	Accounting II	3
ECONOM 1014	Principles of Microeconomics	3
ECONOM 1015	Principles of Macroeconomics	3
ECONOM 3229	Money, Banking and Financial Markets	3
FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3
FINPLN 3282	Financial Counseling	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 3287	Consumer and Household Economics I	3
FINPLN 4187	Tax Planning	3
FINPLN 4188	Community Agencies and Volunteerism	3
FINPLN 4380	Assessing the American Dream	3
FINPLN 4382	Financial Planning: Risk Management	3
FINPLN 4383	Financial Planning: Investment Management	3
FINPLN 4386	Financial Planning: Employee Benefits and Retirement Planning	3
FINPLN 4389	Financial Planning: Case Analysis	3
FINPLN 4393	Financial Planning: Estate and Gift Planning	3
FINPLN 4993	Internship in Personal Financial Planning	1-99
MANGMT 3540	Introduction to Business Law	3
MATH 1400	Calculus for Social and Life Sciences I	3
STAT 2500	Introduction to Probability and Statistics I	3
STAT 3500	Introduction to Probability and Statistics II	3

## Semester Plan

A sample plan is not currently available. Contact the department for additional information.

## Minor in Personal Financial Management Services

This minor is intended for majors other than Finance and Agricultural Economics.

### Required Courses:

FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 3287	Consumer and Household Economics I	3
Choose at least two of the following:		6
FINPLN 3282	Financial Counseling	
FINPLN 4187	Tax Planning	
FINPLN 4380	Assessing the American Dream	
FINPLN 4382	Financial Planning: Risk Management	
FINPLN 4383	Financial Planning: Investment Management	
Total Credits		16

## Minor in Personal Financial Planning for Agricultural Economics majors

Students can minor in Personal Financial Planning to complement their degrees in journalism, business, arts and science or other disciplines that provide expertise in matters related to personal financial management. A specific agreement exists with the Department of Agricultural Economics allows students from those departments to complete a particular set of courses and be awarded a minor in Personal Financial Planning that, upon completion, allows them to sit for the CFP® certification examination.

### Minor in Personal Financial Planning

FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 3287	Consumer and Household Economics I	3
Select at least one of the following:		3
FINPLN 4382	Financial Planning: Risk Management	
FINPLN 4383	Financial Planning: Investment Management	
Total Credits		13

## Majors Incorporating the Personal Financial Planning Minor

These minors, when combined with appropriate courses in the major, create a CFP® Board Registered degree option. Please see a faculty advisor for details.

### PFP Minor with Agricultural Economics

FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 4382	Financial Planning: Risk Management	3
FINPLN 4383	Financial Planning: Investment Management	3
FINPLN 4386	Financial Planning: Employee Benefits and Retirement Planning	3
FINPLN 4389	Financial Planning: Case Analysis	3
FINPLN 4393	Financial Planning: Estate and Gift Planning	3
Total Credits		22

## Minor in Personal Financial Planning for Finance majors

Students can minor in Personal Financial Planning to complement their degrees in journalism, business, arts and science or other disciplines that provide expertise in matters related to personal financial management. A specific agreement exists with the Department of Finance allows students from those departments to complete a particular set of courses and be awarded a minor in Personal Financial Planning that, upon completion, allows them to sit for the CFP® certification examination.

### Minor in Personal Financial Planning

FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3



FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 3287	Consumer and Household Economics I	3
Select at least one of the following:		3
FINPLN 4382	Financial Planning: Risk Management	
FINPLN 4383	Financial Planning: Investment Management	
Total Credits		13

## Majors Incorporating the Personal Financial Planning Minor

These minors, when combined with appropriate courses in the major, create a CFP® Board Registered degree option. Please see a faculty advisor for details.

### FPF Minor with Finance

FINPLN 2083	Financial Planning Careers	1
FINPLN 2183	Personal and Family Finance	3
FINPLN 4386	Financial Planning: Employee Benefits and Retirement Planning	3
FINPLN 4389	Financial Planning: Case Analysis	3
FINPLN 4393	Financial Planning: Estate and Gift Planning	3
FINPLN 4382	Financial Planning: Risk Management	3
or FINANC 3300	Personal Risk Management and Insurance	
FINPLN 4383	Financial Planning: Investment Management	3
or FINANC 4020	Investments	
ACCTCY 4353	Introduction to Taxation	3
or FINPLN 4187	Tax Planning	
Total Credits		22

## Graduate

### MS in Personal Financial Planning

#### Degree Information

##### Master of Science (thesis option)

The thesis-based Master of Science program requires a minimum of 30 hours. Course work focuses on critical analysis of the interaction of the household sector with the markets for labor, consumer goods and financial products. Emphasis is placed on developing analytical skills. Course work culminates in a master's thesis.

##### Five-Year Bachelor of Science/Master of Science Option

The curriculum of this 150-Hour Program provides students with a comprehensive background in financial planning procedures and practice, meeting the Certified Financial Planner Board of Standards' education requirement, allowing a student to sit for the CERTIFIED FINANCIAL PLANNER™ exam. Coursework encompasses root disciplines of economics, mathematics, and statistics and focuses on the interaction between the household and the financial sector. Students will acquire a broad background in business related courses, as well as skills in communication, professional practice, and use of computer information systems.

### Applied Master of Science (non-thesis option)

The Applied Master of Science is a 36 hour program. Course work is designed to complete the education required to sit for the national CERTIFIED FINANCIAL PLANNER™ exam and to broaden the practitioner's understanding of the various factors that can affect and enhance a client's financial security and economic well-being. Coursework culminates in a creative component, providing students an opportunity to integrate theory and practice in exploring or resolving issues related to personal financial planning. (This degree is also available via distance education through the Great Plains IDEA group. Note, the Great Plains IDEA degree option will require 42 hours to complete. Please see [http://pfp.missouri.edu/graduate\\_distance.html](http://pfp.missouri.edu/graduate_distance.html) for more information.)

### Application Deadlines

Fall deadline: February 1  
Spring deadline: October 1

### Admission Criteria

- Minimum TOEFL scores (for ESL applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GPA: 3.0 in last 60 hours

### Required Application Materials

To the Graduate School:

- All required Graduate School documents
- 3 letters of recommendation
- GRE scores (or GMAT for Applied MS in Personal Financial Planning)
- Statement of Purpose
- Official transcripts
- Resume

### Graduate Certificate in Personal Financial Planning

The Personal Financial Planning Certificate is an 18 hour non-degree, post-baccalaureate program designed to prepare students to sit for the rigorous, national CERTIFIED FINANCIAL PLANNER™ exam.

Program applicants must have completed a bachelor's degree. Completing the Personal Financial Planning Certificate satisfies the Certified Financial Planner Board of Standards' education requirement, which is one of four requirements leading to approval to use the CFP® designation. The other three requirements are passing the national exam, meeting an experience requirement and agreeing to adhere to the CFP® code of ethics. The CERTIFIED FINANCIAL PLANNER™ designation is widely recognized as the premier professional designation in the personal financial management services industry. (This certificate is also available via distance education through the Great Plains IDEA group. Please see [http://pfp.missouri.edu/graduate\\_distance.html](http://pfp.missouri.edu/graduate_distance.html) for more information.)

Courses Required for the Applied Master's Degree and the Graduate Certificate in Personal Financial Planning:

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FINPLN 7382	Financial Planning: Risk Management	3
FINPLN 7383	Financial Planning: Investment Management	3
FINPLN 7187	Financial Planning: Tax Planning	3
FINPLN 7386	Financial Planning: Employee Benefits and Retirement Planning	3
FINPLN 7393	Financial Planning: Estate and Gift Planning	3
FINPLN 7389	Financial Planning: Case Analysis	3

## Elective Courses

Since the Personal Financial Planning Certificate is a registered program under the oversight of a professional organization granting a professional designation, all courses are required. Electives may be taken as part of the Applied Master of Science (non-thesis options), the Master of Science (thesis option) and the doctoral programs.

## For more information

Contact Rui Yao, PhD, CFP®, 239B Stanley Hall. Phone: (573) 882-9343 or our administrative assistant at (573) 882-7836. Send an email to Dr. Yao at [yaor@missouri.edu](mailto:yaor@missouri.edu).

## Social Work

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## Faculty

**Professor** C. Galambos\*\*, M. Kelly\*\*, M. Sable\*\*

**Associate Professor** K. Anderson\*\*, M. Markward\*, J. W. Watt\*\*, D. Yoon\*\*

**Assistant Professor** D. Albright\*, K. Canada\*, A. Curl-Black\*\*, D. Fitch\*\*, C. Peters\*\*, A. Thompson\*, M. Yu\*,

**Associate Research Professor** L. Tenkku\*

**Teaching Assistant Professor** K. Benner\*, S. Cary\*, C. Snively\*

**Clinical Instructor** A. Aderton\*, T. Freelin\*, R. Freese\*, L. Hilleman\*, C. Iveson\*, C. Woods\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 532)
- BSW in Social Work (p. 532)

Social work is a dynamic and growing human service profession that plays an increasingly important and visible role in our everyday lives. The major educational objective of the undergraduate program in the School of Social Work, which is a unit in the College of Human and Environmental Sciences, is to prepare students for competent and skillful first-level professional social work practice.

The Bachelor of Social Work (BSW) professional program is built upon a rigorous liberal arts foundation that prepares students for general practice in social work. Within this framework, students are prepared to apply a configuration of knowledge, values and skill to a variety of individual, family and community problems to effect positive change.

The School of Social Work is accredited by, and a charter member of, the Council on Social Work Education. BSW students and graduates are eligible for membership in the National Association of Social Workers.

## Career & Employment Outlook

Jobs in social work are expected to grow faster than average into the 21st century. Through social work's unique person-in-environment focus, BSW graduates are prepared to work effectively with individuals, families, small groups, communities and organizations.

Graduates are employed in many different settings, including nursing homes, hospices, hospitals, home care agencies, family service agencies, children and youth services, aging services, residential treatment programs, domestic violence shelters, criminal justice agencies, schools, and legal services agencies.

## Graduation Requirements

A minimum of 120 credits with a GPA of 2.5 is required for graduation. The requirements include liberal arts foundation courses, professional BSW core courses and general electives. Students must have a grade of C+ or better in all required social work core classes.

The Professional BSW core consists of 46 credits. BSW core courses are offered only once each year in sequence and require three semesters to complete. In the third semester of the BSW core, each student will participate in a social service agency for a 400 hour supervised field instruction.

## Admission to the School of Social Work

Students in good academic standing with fewer than 55 hours may declare a social work major. Students are required to complete a range of courses in liberal arts as foundation to the BSW professional program and as electives.

Admission to the BSW professional program is competitive. In the spring, students may apply for fall admission to the BSW professional social work program if they meet the following criteria:

1. At least 42 credits completed (second semester sophomore status) by the application deadline and
2. 55 credits expected before the beginning of the first semester (fall) of the BSW foundation curriculum
3. Minimum 2.5 cumulative GPA required
4. Completion of required liberal arts prerequisite courses (denoted with \*) with minimum grades in "C" range or higher.
  - Anthropology (student's choice)
  - BIO\_SC 1010\*
  - College Algebra\*
  - COMMUN 1200\*
  - Economics (macro or micro)\*
  - ENGLSH 1000\*
  - History (HIST 1100, HIST 1200, HIST 1400, HIST 2440, HIST 2210) OR Political Science (POL\_SC 1100, POL\_SC 2100)
  - Philosophy (PHIL 1000, PHIL 1100, or PHIL 1200 recommended)\*
  - PSYCH 1000\*
  - SOCIOL 1000\*
5. Submission of BSW Professional Program application, includes personal statement of outlined questions, 3 references, and transcript by early deadline of February 15 or late deadline of May 15.

Students wanting to explore social work as a major may take the following exploratory courses:

SOC_WK 1110	Introduction to the Social Work Major	1
SOC_WK 1115	Social Welfare and Social Work	3
SOC_WK 2000	Exploration in Social and Economic Justice	3

## Graduate

College of Human Environmental Sciences  
 724 Clark Hall  
 573-882-6206  
<http://ssw.missouri.edu/>

**PhD Director of Graduate Studies:** Leigh Tenkku (interim)

**MSW Director of Graduate Studies:** Carol Snively

- MSW in Social Work (p. 534)
- PhD in Social Work (p. 536)
- Graduate Certificate in Gerontological Social Work (p. 537)
- Graduate Certificate in Military Social Work (p. 537)

## About the School of Social Work

For over ninety years, social work education has been offered to students at Missouri's premier public institution. The school is proud of its grass roots history: an early pioneer of social work education in 1906, a founding member of the original accrediting body for social work education in 1919, an institution advancing research and scholarship throughout the 20th century, and finally, to its role as an innovator in doctoral education, with a nationally distinctive PhD program emphasizing state social policy.

The mission of the MU School of Social Work is to promote leadership for social and economic justice by preparing students for professional excellence and leadership in practice, research, and policy. Within the context of a land grant institution, the mission of the School of Social Work reflects the University of Missouri's tightly interlocked missions of teaching, research, outreach, and economic development.

## Careers

The nation faces a critical shortage of qualified personnel who possess the rigorous research skills needed to develop, plan, and evaluate social work interventions and the structure of social services. The Master of Social Work (MSW) Program prepares graduates for leadership in professional social work practice within the areas of Advanced Clinical Social Work Practice or Policy, Planning and Administration in Human Services. Doctoral programs in social work are the major resource for social work researchers and scholars. The rapid growth and development in new social work undergraduate and graduate programs throughout the country has also increased the demand for doctoral social work faculty. In recent years, there have been 400-500 doctoral faculty vacancies advertised annually in schools of social work, while the number of graduates has remained at 250-300 per year, with one hundred of those graduates seeking non-academic positions.

## Undergraduate

### Department Level Requirements - Social Work

#### Departmental Honors

Candidates for departmental Honors must be students in the BSW professional program with a 3.5 or higher GPA. Students must complete honors designated sections of SOC\_WK 4951 Research for Social Work Practice and SOC\_WK 4952 Research Methods for Social Work.

## BSW in Social Work

### Major Program Requirements

Required Entry-Level Courses: Specific liberal arts requirements for graduation are listed below (\* denotes a prerequisite course to the BSW professional program that must be completed before beginning social work core courses).

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

#### Degree Core Requirements

<b>English Composition (grade must be C range)</b>		
ENGLSH 1000	Exposition and Argumentation *	3
<b>Writing intensive classes</b>		
Writing intensive classes <sup>1</sup>		6
<b>Humanities (grades for communication and philosophy must be in the "C" range)</b>		
COMMUN 1200	Public Speaking	3
Select one of the following:		3
PHIL 1000	General Introduction to Philosophy	

PHIL 1100	Introduction to Ethics	
PHIL 1200	Logic and Reasoning	
Additional humanities <sup>2</sup>		3
<b>Science and Math Reasoning Proficiency (grades must in the C range)</b>		
BIO_SC 1010	General Principles and Concepts of Biology (with a minimum grade in the C range)	3
or BIO_SC 1500 Introduction to Biological Systems with Laboratory Lab Science AND Physical or Mathematical Science		
		9
Approved for social work students:		
SOC_WK 4310	Social Statistics	
ESC_PS 4170	Introduction to Applied Statistics	
STAT 1200	Introductory Statistical Reasoning	
STAT 1300	Elementary Statistics	
<b>College Algebra</b>		
MATH 1100	College Algebra <sup>*,3</sup>	3
<b>Social science (minimum grade for anthropology, economics and government must be in the C range)</b>		
Economics (micro or macroeconomics) <sup>*</sup>		3
Anthropology (student's choice) <sup>*</sup>		3
History <sup>*</sup>		3
Political Science <sup>*</sup>		3
*One course from either history or political science must meet the state government requirement; may be satisfied by		
POL_SC 1100	American Government	
or POL_SC 2100	State Government	
HIST 1100	Survey of American History to 1865	
HIST 1200	Survey of American History Since 1865	
HIST 1400	American History	
HIST 2210	Twentieth Century America	
HIST 2440	History of Missouri	
HIST 4000	Age of Jefferson	
HIST 4220	U.S. Society Between the Wars 1918-1945	
HIST 4230	Our Times: United States Since 1945	
<b>Behavioral science (grades for sociology and psychology must be in the "C" range)</b>		
SOCIOL 1000	Introduction to Sociology <sup>*</sup>	3
or RU_SOC 1000 Rural Sociology		
PSYCH 1000	General Psychology <sup>*</sup>	3
SOCIOL 3310	Social Psychology	3
or PSYCH 2310	Social Psychology	
SOC_WK 2220	Human Behavior and the Environment	3
SOC_WK 3320	Understanding Personality in a Social Context	3
<b>Cultural, ethnic and racial diversity (6 hours) <sup>4</sup></b>		
Recommend SW 2000 (Social Justice); See others on Blackboard List		
<b>Electives to reach 120 credits <sup>5</sup></b>		6
<b>Social work requirements</b>		

SOC_WK 2220	Human Behavior and the Environment	3
SOC_WK 4710	Social Justice and Social Policy	3
SOC_WK 4711	Social Justice and Social Policy II	3
SOC_WK 4720	Variations in Human Behavior	3
SOC_WK 4730	Introduction to Social Work Practice	3
SOC_WK 4740	Introduction to Community and Organizational Processes	4
SOC_WK 4750	Interaction Skills Workshop	3
SOC_WK 4760	Theory and Practice of Social Group Work	3
SOC_WK 4770	Strategies of Direct Practice	3
SOC_WK 4951	Research for Social Work Practice	3
SOC_WK 4952	Research Methods for Social Work	3
SOC_WK 4970	Senior Professional Seminar	3
SOC_WK 4971	Undergraduate Field Practicum	6
Social work elective (4000-level) in a field of practice		3
<b>Total Credits</b>		<b>112</b>

- 1 Students accepted into the professional BSW program must take SOC\_WK 2220 and SOC\_WK 4951, which must both be designated "WI." No additional "WI" courses are required.
- 2 Humanities include art and music history and appreciation classes, classical studies courses, foreign civilization courses, literature courses in English or other languages and religious studies courses. Applied art and music performance courses do not count toward the humanities requirement. Students are urged to check with their advisor before selecting courses.
- 3 One course in humanities or biological, physical or mathematical sciences must be at the 2000 level or higher.
- 4 Two courses that reflect the cultural diversity of our society; often selected from social work, sociology, anthropology, peace studies, English, foreign civilizations, religious studies and human development and family studies, black studies and women and gender studies. SOC\_WK 2000 Exploration in Social and Economic Justice, is strongly preferred as one of the courses. Students are urged to check with their advisor before selecting courses.
- 5 In addition to the above liberal arts requirements and the 46-credit Professional BSW Core (inclusive of SOC\_WK 2220), students select electives to reach the total credit requirement. SOC\_WK 1115 Social Welfare and Social Work is strongly recommended.

## Capstone Requirements

All students accepted into the professional BSW program must take SOC\_WK 4971 Undergraduate Field Practicum and SOC\_WK 4970 Senior Professional Seminar as their capstone experience.

## Basic Skills Credit Limitations

No more than 4 credits may be taken from "skills" courses to count toward the required 120 credits. More skill classes may be taken, but will be in excess of the 120 credits. Examples of skills courses are applied art and music performance classes, computer skills, self-defense and first aid.

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000*	3	COMMUN 1200*	3
BIO_SC 1010*	3	MATH 1100*	3
BIO_SC 1020	2	SOCIOL 1000*	3
PSYCH 1000*	3	Anthropology (any)*	3
SOC_WK 1110 (Elective)	1	SOC_WK 1115 (Elective)	3
History (Constitution)*	3		
	15		15
Second Year			
Fall	Credits	Spring	Credits
SOC_WK 2220	3	SOC_WK 3320	3
Cultural Diversity	3	Philosophy (any)*	3
Economics*	3	Political Science	3
Elective	3	Humanities (upper level)	3
Elective	3	Social Psychology	3
	15		15
Third Year			
Fall	Credits	Spring	Credits
SOC_WK 4740	4	SOC_WK 4711	3
SOC_WK 4710	3	SOC_WK 4720	3
SOC_WK 4730	3	SOC_WK 4310	4
SOC_WK 4750	3	SOC_WK 4760	3
Field of Practice Elective	3	SOC_WK 4951	3
	16		16
Fourth Year			
Fall	Credits	Spring	Credits
SOC_WK 4770	3	Cultural Diversity	3
SOC_WK 4952	3	Elective	3
SOC_WK 4971	6	Elective	3
SOC_WK 4970	3	Elective	3
		Elective	2
	15		14
Total Credits: 121			

## Graduate

### MSW in Social Work

#### Admission Contact Information

Crystal Null (nullc@missouri.edu)  
 724 Clark Hall; Columbia, MO 65211  
 573-884-9385  
<http://ssw.missouri.edu/msw.shtml>

The University of Missouri's Master of Social Work (MSW) Program prepares competent, effective and ethical social work professional leaders for social change. The MSW Program emphasizes a commitment to enhancing human well-being by alleviating social problems, embracing diversity and promoting social and economic justice with systems of all sizes through advanced clinical social work practice and policy planning and administration in human services. The MSW program prepares students to promote social and economic justice that responds to the broad economic, social, and cultural needs of the public and private. The MSW Program is fully accredited by the Council on Social Work Education, of which the School of Social Work is a charter member.

### Financial Aid from the Program

Scholarship opportunities are available for full-time and part-time program applicants who meet the early application deadline. A separate Scholarship Application is available on the department website. Submission of the Scholarship Application is due by early application deadline.

### Application Deadlines

Fall deadline: January 15  
 Spring deadline: September 15  
 Summer deadline: January 15

### Admission Criteria

- Minimum GPA: 3.0
- Bachelor's degree from an accredited college or university with the applicant's undergraduate transcript reflecting a sound liberal arts foundation, including courses in the humanities, as well as in the social and behavioral sciences.
- All International students must submit Internet-based (iBT) TOEFL scores or IELTS scores. No waivers will be given.

### Minimum iBT TOEFL scores:

Test Portion	Total Minimum Score*
Listening	22
Reading	21
Writing	23
Speaking	26

### Minimum IELTS scores:

Test Portion	Total Minimum Score*
Listening	6.5
Reading	6.5
Writing	6
Speaking	8

### Prerequisites

All MSW applicants must complete an approved college level statistics course with a grade of C- or higher before they will be accepted to enroll in the MSW program. is the recommended course for University of Missouri students. The following University of Missouri courses are also approved and may be taken in lieu of SOC\_WK 4310: STAT 1200, , STAT 1400, STAT 2500, and ESC\_PS 4170. Statistics courses completed at other academic institutions may substitute for University of Missouri statistic courses, pending submission of official transcript and approval by the MSW Program Director. Completion of the

statistics course prior to application submission is preferred and strongly recommended. If an applicant is enrolled in a statistics course at the time of application and accepted into the MSW Program, the acceptance will be "pending successful completion of the approved statistics class".

**Note:** Priority admission deadline for Regular Standing Applicants: January 15. A student qualifies for Regular Standing Admission if s/he has an undergraduate degree in any field other than Social Work. Any applicant who applies after the priority deadline will be considered on the rolling admission cycle until April 15.

**Note:** Priority admission deadline for Advanced Standing applicants: January 15 (for summer admission), September 15 (for spring admission). An applicant qualifies for Advanced Standing admission if they have a bachelor's degree in Social Work earned within the last seven (7) years. Any Advanced Standing applicant who applies after the priority deadline of January 15 for summer admission will be considered on a rolling admission cycle until April 15. Any Advanced Standing applicant that applies after the priority deadline of September 15 for spring admission will be considered on a rolling admission cycle until November 15.

Read more about Regular vs. Advanced Standing below.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the MSW Program:

- Departmental application
- Personal statement (see department instruction)
- Three letters of reference from persons who can address the applicant's intellectual ability and interpersonal skills, potential for graduate education, and potential for professional social work practice through observation in an educational or work (paid or volunteer) setting. Letters of reference should not be submitted from friends or family

## Plans of Study

Preparation for professional leadership encompasses two major components:

### Foundation

Develops knowledge and skills related to social interaction, human development, community dynamics, social policy and societal values applicable to generalist social work practice.

### Foundation Courses

SOC_WK 7710	Social Policy and Service Delivery in Social Work	3
SOC_WK 7720	Foundations of Human Behavior	3
SOC_WK 7730	Direct Practice	3
SOC_WK 7740	Community and Organization Dynamics	3
SOC_WK 7760	Foundations of Justice	3
SOC_WK 7952	Research Methods in Social Work	3
SOC_WK 7971	Graduate Field Practicum I	6
<b>Total Credits</b>		<b>24</b>

## Concentrations

The MSW program offers two concentrations: Advanced Clinical Practice and Policy, Planning and Administration (PP&A). Within these concentrations, students have the opportunity to create a plan of study based on their individual interests and professional goals. Decisions regarding their chosen concentration are made by students in consultation with faculty advisors. A brief description of the two concentrations is as follows:

**Advanced Clinical Social Work Practice:** includes strategies of clinical intervention with socially and economically disadvantaged individuals, families, and small groups in a variety of health, mental health, family and children services, and senior citizen agencies.

### Concentration Courses: Clinical

-----	Advanced Clinical Selective (choose 1 from those offered) *	3
-----	Advanced Policy Elective (choose 1 from those offered) *	3
-----	Advanced Diversity Elective (choose 1 from those offered) *	3
-----	Elective (must be graduate level; could be an additional Diversity Elective or Policy Elective course) *	3
SOC_WK 7770	Strategies of Clinical Social Work Intervention	3
SOC_WK 7820	DSM IV and Psychopathology	3
SOC_WK 8952	Evaluative Research in Clinical Social Work Practice	3
SOC_WK 8970	Professional Practice Seminar I	3
SOC_WK 8971	Graduate Field Practicum II	12
<b>Total Credits</b>		<b>36</b>

**Policy, Planning and Administration in Human Services:** includes intervention strategies that effect change at the organizational, interagency, community, and societal levels to advance social and economic justice for consumers of social and human services and to empower practitioners within those agencies.

### Concentration Courses: Policy, Planning & Administration

-----	Advanced Policy Elective (choose 1 from those offered) *	3
-----	Advanced Diversity Elective (choose 1 from those offered) *	3
-----	Elective (must be graduate level; could be an additional Diversity Elective or Policy Elective course) *	3
SOC_WK 7780	Fundamentals of Social Work Administration	3
SOC_WK 7920	Advanced Foundations of Human Behavior for Administrators	3
SOC_WK 8350	Management of a Social Agency	3
SOC_WK 8953	Evaluative Research in Social Work Planning and Administration	3
SOC_WK 8970	Professional Practice Seminar I	3
SOC_WK 8971	Graduate Field Practicum II	12
<b>Total Credits</b>		<b>36</b>

\* Please note: Clinical electives, policy electives, diversity electives, and other elective courses offered will vary from year to year.

## Course Format

On Campus MSW Program courses are primarily offered in-person. A few foundation, concentration & elective courses are offered online through Blackboard, learning management system licensed to the University of Missouri for online courses. An occasional elective course is offered in a combined format (ITV and in-person), with the on-campus MSW student attending in-person while the course is broadcast to the Off Campus MSW Program students through Interactive Television (ITV).

Traditional in-person courses offered to the Off Campus MSW Program are held on the campuses of collaborating regional universities for these programs: Southeast Missouri State University (SEMO), Missouri University of Science and Technology in south central Missouri, Missouri Western State College and Northwest Missouri State University in northwest Missouri and Truman State University in north central Missouri.

The Off-Campus program also collaborates with a number of offices throughout the state to provide courses through Interactive Television (ITV). Other courses are offered online through Blackboard, a learning management system licensed to the University of Missouri for online courses. Elective courses offered online or ITV elective courses may have both on and off campus students enrolled in a common section. When this occurs with courses offered through ITV, on campus students attend the ITV classroom where the class is originated.

Practice classes that focus on the development of relationship building skills and/or teach a specific clinical social work technique are offered only through an in-person format. Courses that focus on theory, policy &/ or research may be offered online.

## Regular Standing: Non-Social-Work Bachelor's

The regular 60-credit hour degree is appropriate for students who have undergraduate degrees other than accredited social work degrees. The school admits full-time students to the regular 60-credit hour program at the beginning of the fall semester only. Part-time students are admitted at the beginning of fall and spring semester.

## Advanced Standing: Bachelor's in Social Work (BSW)

Students who have graduated within the past seven years from a baccalaureate social work program accredited by the Council on Social Work Education may be eligible for the Advanced Standing Program, which is an accelerated 39-credit hour degree.

## Starting Dates

On-campus students admitted to the Regular Standing Program are admitted either in fall semester (full-time or part-time study) or spring semester (part-time study only). On-campus students admitted to the Advanced Standing Program are admitted either in the spring or summer session. On-campus Advanced standing students in the policy, planning and administration concentration must enter in the spring semester. Off-campus students admitted to the Regular Standing Program are admitted for fall semester (part-time) in even numbered years and off-campus students admitted to the Advanced Standing Program are admitted for fall semester (part-time) in odd numbered years.

## Length of Study & Satisfactory Progress

Full-time Regular Standing students take 15 credits each semester and graduate in two years (4 semesters of study). Full-time Advanced Standing students take 3-5 classes each semester (9-15 credits) and graduate in 12-17 months (3 semesters of study). Part-time Regular Standing students take 2-3 classes (6-9 credits) every semester, including summer, and graduate in three years (9 semesters of study). Part-time Advanced Standing students take 2-3 classes (6-9 credits) every semester, including summer, and graduate in two years (6 semesters of study). All students are full-time during their last semester while completing block placement. All students must complete at least eight hours per academic year to maintain a satisfactory rate of progress.

## PhD in Social Work

### Admission Contact Information

Shannon Mezzanotte (mezzanottes@missouri.edu)  
724 Clark Hall; Columbia, MO 65211  
573-884-1438

### About the Program

The Doctor of Philosophy (PhD) program in social work focuses on research that informs social welfare policy and practice. It is designed to prepare scholars for research, teaching and program development positions in academic and professional social work practice and policy settings.

### Financial Aid from the Program

Scholarship opportunities are available for full-time program applicants who meet the application deadline. Graduate teaching and research assistantships are also often available. Some forms of support require additional forms from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

### Admission Criteria

Fall deadline: Midnight October 31

- Minimum GPA: 3.0; 3.5 in graduate study
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- An MSW or related master's is required. Applicants without the MSW must take a minimum of 12 credit hours of MSW course work. This requirement may be waived for applicants with additional graduate work.
- Minimum of two years post-master's practice experience encouraged.

**Note:** These criteria are used flexibly to assess the applicant's potential for study and research in this program.

### Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Director of the Doctoral Program in Social Work (either via the grad schools online application system or mailed in hard copy):

- Cover letter



- Three letters of recommendation
- Resume
- Writing proficiency sample
- Personal statement
- GRE test scores from within the last 7 years
- A personal interview is required, and if possible, will be arranged at MU. A Skype interview may be utilized in some cases.

## Plan of Study

The PhD program is available to both persons with a Masters of Social Work (MSW) degree and those with other master's degrees. The curriculum consists of a minimum of 51 post MSW semester credit hours or, for applicants without an MSW, 63 hours. The curriculum is divided among three distinct but highly interrelated elements designed to complement one another in assisting students to achieve the competencies expected of a graduate of this program. A core of social work courses provides the foundation in the traditions and knowledge in the profession and exposure to state-of-the-art research and techniques for the 21st century. Electives from the broad spectrum of social and behavioral sciences offering available through MU departments provide students with the opportunity to design an individualized plan of study that capitalizes on their unique interests and talents. A strong regimen of research methodology, theory, and policy analysis are designed to prepare students for use of both current and emerging methods of scientific inquiry.

## Graduate Certificate in Gerontological Social Work

The Graduate Certificate in Gerontological Social Work at the University of Missouri is designed to expand the pool of professionals who are qualified to work in settings with older adults and their families. The certificate focuses on practice strategies of social work intervention from micro, mezzo, and macro perspectives.

This certificate will be available to students enrolled in the MU School of Social Work master's program as part of their graduate training as well as a stand-alone certificate to graduate level clinical social work practitioners and graduate level policy and administration social work practitioners who wish to augment their knowledge and skills in this area. Approval of the MSW Program Director and Committee, and Director of the Graduate certificate in Gerontological Social Work is required for admission to the certificate program.

Participants in the Gerontological Social Work Certificate program build awareness and expertise for work in settings that serve older adults and their families. Participants are trained in micro, mezzo, macro and clinical strategies known to be effective in work with older adults and their families. An interdisciplinary, multi-level emphasis will be provided in the program since a large component of elder care is the coordination and management of services provided by various disciplines. Course work will utilize a bio-psycho-social-cultural perspective emphasizing the ecological perspective, Lawton's theory of environmental press, resiliency, and the functional age model of family work. In addition, students will build awareness of aging policies and services, and policies that impact persons with disabilities and women.

As a result of earning the Gerontological Social Work Graduate Certificate, practicing MSW's or Post-MSW degree practitioners can expect enhanced employability due to the development of new skills that

respond to growing societal need. Current MSW students benefit from the graduate certificate by completing a concentrated course of study on a population group and obtaining specialty training with population/services needing graduate level social workers.

Because all of the Gerontological Social Work Graduate Certificate courses fulfill other requirements of our MSW program, a current MSW student can conveniently earn the Gerontological SW Graduate Certificate while completing their MSW. No additional coursework is required.

The Gerontological SW Grad Certificate consists of 12 credit hours, including two required courses, one elective and one interdisciplinary course. The required courses include: 1) "Helping Strategies with Older Adults " (counts as a diversity elective); and 2) " Policies and Services for Older Adults " (counts as a policy elective).

For the third course, clinical MSWs choose between "Family Treatment", "Resiliency and Solution Focused Practice", "Client Case Management, Networking, and Advocacy", and " Narrative Approaches to Social Work Practice " (all count as a clinical selective). Policy, Planning and Administrative MSWs choose between "Women, Poverty and Mental Health" and " Disability Rights Advocacy". For the fourth class, students will choose from a variety of acceptable interdisciplinary courses.

During the final semester of the MSW Program, the full-time block practicum experience 40 hours/week (680 total hours) is arranged at a setting where students will gain skills practicing with older adults. The Director of Field in conjunction with the Director of the Graduate Certificate in Gerontological Social Work works with students to choose a practicum setting that fits SSW requirements and student interests. Practicing MSWs only complete 12 hours of coursework and are not required to complete an additional practicum experience.

For additional information about the Graduate Certificate in Gerontological Social Work, please contact Dr. Colleen Galambos at galambosc@missouri.edu.

## Graduate Certificate in Military Social Work

The School of Social Work offers graduate certificates in Military Social Work and in Gerontological Social Work.

The Graduate Certificate in Military Social Work is designed to expand the pool of professionals who are qualified to work in settings with military personnel, veterans, and their families. The Certificate focuses on clinical practice strategies of social work intervention with military personnel and their families to improve the mental health and health of this population.

This certificate is available both to students enrolled in the MU School of Social Work Masters of Social Work (MSW) Program as part of their graduate training as well as a stand-alone entity to civilian graduate level clinical social work practitioners who wish to augment their knowledge and skills in this area. Only Clinical MSWs and MSW Clinical students will be accepted to the Military SW Graduate Certificate Program. Approval of the MSW Program Director is required for admission into the graduate certificate program.

Because all of the Military Social Work Graduate Certificate courses fulfill other requirements of our MSW program, a student can conveniently earn the Military SW Graduate Certificate while completing their MSW. No additional coursework is required.

The Military SW Grad Certificate consists of 12 credit hours, including three required courses and one elective. The required courses include: 1) "Military Culture: Issues for Helping Professionals" (counts as a diversity elective); 2) "Military Social Work" (counts as a free elective); and 3) "Trauma Practice and Crisis Intervention" (counts as a clinical selective). For the fourth class, students will choose either "Disability Rights Advocacy" or "Organizational Issues in Child Welfare" (counts as a policy elective). The assignments in all classes will be focused on Military SW issues.

During the final semester of the MSW Program, the full-time block practicum experience 40 hours/week (680 total hours) is arranged at a setting where students will gain skills practicing with military personnel, veterans or their families. The Director of Field in conjunction with the Director of the Graduate Certificate in Military Social Work works with students to choose a practicum setting that fits SSW requirements and student interests. Practicing MSWs only complete 12 hours of coursework and are not required to complete an additional practicum experience. For additional information about the Graduate Certificate in Military Social Work, please contact Dr. David Albright at [albrightd@missouri.edu](mailto:albrightd@missouri.edu).

## Textile and Apparel Management

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## Faculty

**Professor** J. Hawley\*\*

**Associate Professor** P. S. Norum\*\*, J. Parsons\*\*

**Assistant Professor** J. Ha-Brookshire\*\*, M. Sohn\*, S. Song\*

**Instructor** K. Mc-Bee-Black

**Professor Emeritus** K. G. Dickerson, D. Saxon, L. E. Wilson\*\*

**Associate Professor Emeritus** B. Dillard\*, J. H. Pry

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 539)
- BSHES in Textile and Apparel Management (p. 540)
- Minor in Textile and Apparel Management (p. 543)

The Department of Textile and Apparel Management is a global leader focusing on the apparel and textile supply chain. TAM's award-winning faculty is internationally recognized. TAM prepares students for a wide variety of career options such as merchandising, buying, sourcing, product development, technical design, e-retailing or retail operations. The curriculum focuses on leadership, the global supply chain, sustainability, creativity/innovation and technology. Through course work, field study experiences, internships, leadership conferences and student organizations, TAM students develop the marketing and management skills they need to be a top recruit for industry positions.

Students who major in Textile and Apparel Management may choose from several options and tracks:

- Apparel Marketing and Merchandising
  - Apparel Product Development
  - International Apparel Marketing and Merchandising
  - International Apparel Product Development
- \*(Note: Tracks do not appear on transcripts or diplomas.)

Students who want to explore Textile and Apparel Management may take the following classes:

T_A_M 1100	Introduction to the Textile and Apparel Industry	3
T_A_M 1200	Basic Concepts of Apparel Design and Production	3
T_A_M 1300	Softgoods Retailing	3
T_A_M 2200	Science of Textiles	3
T_A_M 2400	Global Consumers	3

## Graduate

137 Stanley Hall  
 Columbia, MO 65211  
 573-882-7317  
<http://tam.missouri.edu/>

**Director of Graduate Studies:** Pam Norum

- MA in Textile and Apparel Management (p. 544)
- MS in Textile and Apparel Management (p. 544)

The College also offers a PhD in Human Environmental Sciences with an emphasis Textile and Apparel Management (p. 515).

Graduate programs in textile and apparel management offer the following areas of study: apparel manufacturing management; apparel marketing and merchandising; e-commerce, supply chain management, economic/trade issues related to domestic and global textile and apparel industry; historical and cultural aspects textiles and dress; and consumer marketplace concerns.

## Careers

Career opportunities for graduates exist in many areas, such as higher education, industry analysis, museums, product development, production management and cooperative extension.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Undergraduate

## Department Level Requirements - Textile & Apparel Management

There are four tracks available in Textile and Apparel Management: (1) Apparel Marketing and Merchandising, (2) International Apparel Marketing and Merchandising, (3) Apparel Product Development, or (4) International Apparel Product Development. These tracks are designed

to provide students with knowledge and skills necessary to function in the global textile and apparel industry. (Note: Tracks do not appear on transcripts or diplomas). Students majoring in Textile and Apparel Management are required to take a set of core courses (p. 540). Students may not take departmental courses using the Pass/Fail grading option. In addition to college and department requirements, students must meet all University graduation requirements (p. 17) including University general education (p. 18).

## BSHES in Textile and Apparel Management

### Major Program Requirements

There are four tracks available in Textile and Apparel Management: (1) Apparel Marketing and Merchandising, (2) International Apparel Marketing and Merchandising, (3) Apparel Product Development, or (4) International Apparel Product Development. These tracks are designed to provide students with knowledge and skills necessary to function in the global textile and apparel industry. (Note: Tracks do not appear on transcripts or diplomas.) Students majoring in TAM may not take departmental courses using the Pass/Fail grading option. In addition to college and department requirements, students must meet all University graduation requirements (p. 17) including University general education. Some courses in the Professional Program are allowed to double count for General Education requirements (p. 18). This program can be completed in 120 hours. The following courses are required of all students majoring in Textile and Apparel Management (TAM).

### Core Requirements

T_A_M 1100	Introduction to the Textile and Apparel Industry	3
T_A_M 1200	Basic Concepts of Apparel Design and Production	3
T_A_M 1300	Softgoods Retailing	3
T_A_M 2120	Professional Seminar	1
T_A_M 2200	Science of Textiles	3
T_A_M 2400	Global Consumers	3
T_A_M 2500	Social Appearance in Time and Space	3
T_A_M 4510	19th and 20th Century Western Dress (course is changing to TAM 3520 effective SP2014)	3
T_A_M 4110	Global Sourcing	3
T_A_M 3410	The Clothing/Textile Consumer: Research and Analysis (course is changing to T_A_M 4400 effective SP2014)	3
Total Credits		28

### Apparel Marketing and Merchandising

T_A_M 2300	Retail Finance and Merchandise Control	3
T_A_M 3700	MultiChannel Retailing in the Digital World	3
or T_A_M 3300	Retail and Merchandising Analysis	
T_A_M 4990	Retail Marketing and Merchandising	3
TAM elective hours		12

#### Supporting Course Requirements

CHEM 1100	Atoms and Molecules with Lab	3
ECONOM 1014	Principles of Microeconomics *	3
or AG_EC 1041	Applied Microeconomics	

ECONOM 1015	Principles of Macroeconomics	3
or AG_EC 1042	Applied Macroeconomics	
ESC_PS 4170	Introduction to Applied Statistics	3
or STAT 1200	Introductory Statistical Reasoning	
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or STAT 2500	Introduction to Probability and Statistics I	
ACCTCY 2036	Accounting I *	3
ACCTCY 2037	Accounting II	3
FINANC 2000	Survey of Business Finance *	3
MANGMT 3000	Principles of Management *	3
MRKTNG 3000	Principles of Marketing *	3
Business Elective (3000 level course or higher) *		3
Total Credits		51

\* Courses required for the Business Minor (p. 336).

### International Apparel Marketing and Merchandising

T_A_M 2300	Retail Finance and Merchandise Control	3
T_A_M 3700	MultiChannel Retailing in the Digital World	3
or T_A_M 3300	Retail and Merchandising Analysis	
T_A_M 4990	Retail Marketing and Merchandising	3
TAM Elective hours		6

#### Supporting Course Requirements

CHEM 1100	Atoms and Molecules with Lab	3
ECONOM 1014	Principles of Microeconomics *	3
or AG_EC 1041	Applied Microeconomics	
ECONOM 1015	Principles of Macroeconomics	3
or AG_EC 1042	Applied Macroeconomics	
ESC_PS 4170	Introduction to Applied Statistics	3
or STAT 1200	Introductory Statistical Reasoning	
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or STAT 2500	Introduction to Probability and Statistics I	
ACCTCY 2036	Accounting I *	3
ACCTCY 2037	Accounting II	3
GEOG 1550	Introduction to the Humanized Earth	3
or GEOG 3780	World Political Geography: Patterns and Processes	
MANGMT 3000	Principles of Management *	3
MRKTNG 3000	Principles of Marketing *	3
PHIL 1100	Introduction to Ethics	3
POL_SC 1400	International Relations	3
Foreign Language (10 hours of the same foreign language)		10
Total Credits		58

\* Courses required for the Business Minor (p. 336). Students must add in Finance 2000 and a Business Elective (3000 level course or higher).

## Apparel Product Development

T_A_M 2280	Apparel Production	4
T_A_M 2380	Integrated Apparel Design and Production I	3
T_A_M 2480	Apparel and Textile Presentation Techniques	3
T_A_M 2580	Digital Textile and Apparel Applications	3
T_A_M 3280	Principles of Apparel Manufacturing	3
T_A_M 3281	Principles Apparel Manufacturing Lab	1
T_A_M 3380	Integrated Apparel Design and Production II	3
T_A_M 3480	Technical Design	3
or T_A_M 4480	Creativity and Problem Solving	
T_A_M 4980	Apparel Production Management	4
<b>Supporting Course Requirements</b>		
CHEM 1100	Atoms and Molecules with Lab	3
ECONOM 1014	Principles of Microeconomics *	3
or AG_EC 1041	Applied Microeconomics	
ECONOM 1015	Principles of Macroeconomics	3
or AG_EC 1042	Applied Macroeconomics	
ESC_PS 4170	Introduction to Applied Statistics	3
or STAT 1200	Introductory Statistical Reasoning	
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or STAT 2500	Introduction to Probability and Statistics I	
ACCTCY 2036	Accounting I *	3
MANGMT 3000	Principles of Management *	3
MRKTNG 3000	Principles of Marketing *	3
Six hours of approved electives in either Art or Theater OR Finance 2000 and a Business Elective (3000 level course or higher). *		
Total Credits		54

\* Courses required for the Business Minor (p. 336).

## International Apparel Product Development

T_A_M 2280	Apparel Production	4
T_A_M 2380	Integrated Apparel Design and Production I	3
T_A_M 2480	Apparel and Textile Presentation Techniques	3
T_A_M 2580	Digital Textile and Apparel Applications	3
T_A_M 3280	Principles of Apparel Manufacturing	3
T_A_M 3281	Principles Apparel Manufacturing Lab	1
T_A_M 3380	Integrated Apparel Design and Production II	3
T_A_M 3480	Technical Design	3
or T_A_M 4480	Creativity and Problem Solving	
T_A_M 4980	Apparel Production Management	4
<b>Supporting Course Requirements</b>		
CHEM 1100	Atoms and Molecules with Lab	3
ECONOM 1014	Principles of Microeconomics *	3
or AG_EC 1041	Applied Microeconomics	
ECONOM 1015	Principles of Macroeconomics	3
or AG_EC 1042	Applied Macroeconomics	
ESC_PS 4170	Introduction to Applied Statistics	3

or STAT 1200	Introductory Statistical Reasoning	
or STAT 1300	Elementary Statistics	
or STAT 1400	Elementary Statistics for Life Sciences	
or STAT 2500	Introduction to Probability and Statistics I	
ACCTCY 2036	Accounting I *	3
GEOG 1550	Introduction to the Humanized Earth	3
or GEOG 3780	World Political Geography: Patterns and Processes	
MRKTNG 3000	Principles of Marketing *	3
or MANGMT 3000	Principles of Management	
PHIL 1100	Introduction to Ethics	3
POL_SC 1400	International Relations	3
Foreign language (10 hours of the same foreign language)		10
Total Credits		64

\* Courses required for the Business Minor (p. 336). Students must add in Finance 2000, Business Elective (3000 level course or higher), and take both Marketing and Management 3000.

## Semester Plans

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

## Bachelor of Science in Human Environmental Sciences with a track in Apparel Marketing and Merchandising

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
T_A_M 1100	3	NUTR_S 1034 or 1340 (Recommended Biological Science course)	3
CHEM 1100	3	COMMUN 1200	3
GN_HES 1100	1	T_A_M 1200	3
American History or Government	3	T_A_M 1300	3
Humanities	3		
	16		15
Second Year			
Fall	Credits	Spring	Credits
ECONOM 1014 or AG_EC 1041	3	ECONOM 1015 or AG_EC 1042	3
T_A_M 2500	3	Statistics (Recommend ESC_PS 4170)	3
T_A_M 2400	3	T_A_M 4510 (course is changing to TAM 3520 effective SP2014)	3
HES Foundation	3	T_A_M 2200	3
Humanities	3	T_A_M 2120	1
		General Elective	1
	15		14

Third Year			
Fall	Credits	Spring	Credits
ACCTCY 2036	3	ACCTCY 2037	3
MRKTNG 3000	3	FINANC 2000	3
T_A_M 2300	3	T_A_M 3300 (or TAM Elective )	3
T_A_M 3700 (or TAM Elective )	3	TAM Elective	3
HES Foundation	3	General Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
MANGMT 3000	3	T_A_M 4110	3
Business Elective (level 3000 or higher)	3	T_A_M 3410 (course is changing to T_A_M 4400 effective SP2014)	3
TAM Elective	3	T_A_M 4990	3
General Elective	3	General Elective	3
General Elective	3	TAM Elective	3
	15		15
Total Credits: 120			

### Bachelor of Science in Human Environmental Sciences with a track in International Apparel Marketing and Merchandising

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
CHEM 1100	3	NUTR_S 1034 or 1340 (Recommended Biological Science course)	3
T_A_M 1100	3	T_A_M 1200	3
GN_HES 1100	1	T_A_M 1300	3
Humanities	3	Foreign Language	5
American History or Government	3		
	16		17
Second Year			
Fall	Credits	Spring	Credits
ECONOM 1014 or AG_EC 1041	3	ECONOM 1015 or AG_EC 1042	3
PHIL 1100	3	Statistics (Recommended ESC_PS 4170)	3
T_A_M 2400	3	COMMUN 1200	3
T_A_M 2500	3	T_A_M 2120	1
Foreign Language	5	T_A_M 2200	3
		T_A_M 4510 (course is changing to TAM 3520 effective SP2014)	3
	17		16
Third Year			
Fall	Credits	Spring	Credits
ACCTCY 2036	3	ACCTCY 2037	3
MRKTNG 3000	3	FINANC 2000	3
T_A_M 2300	3	POL_SC 1400	3

T_A_M 3700 (or GEOG 1550 or 3780)	3	T_A_M 3300 (or GEOG 1550 or 3780)	3
HES Foundation	3	TAM Elective	3
	15		15
Fourth Year			
Fall	Credits	Spring	Credits
MANGMT 3000	3	T_A_M 4110	3
General Elective or Business Elective (level 3000 or higher)	3	T_A_M 3410 (course is changing to T_A_M 4400 effective SP2014)	3
HES Foundation	3	T_A_M 4990	3
TAM Elective	3	General Elective	3
	12		12
Total Credits: 120			

### Bachelor of Science in Human Environmental Sciences with a track in Apparel Product Development

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
CHEM 1100	3	American History or Government	3
GN_HES 1100	1	T_A_M 1300	3
HES Foundation	3	T_A_M 2200	3
T_A_M 1100	3	T_A_M 2280	4
T_A_M 1200	3		
	16		16
Second Year			
Fall	Credits	Spring	Credits
ECONOM 1014 or AG_EC 1041	3	ECONOM 1015 or AG_EC 1042	3
COMMUN 1200	3	FINANC 2000 (or Art Course )	3
T_A_M 2380	3	NUTR_S 1034 or 1340 (Recommended Biological Science Course)	3
T_A_M 2480	3	T_A_M 2120	1
T_A_M 2500	3	T_A_M 2580	3
		Humanities	3
	15		16
Third Year			
Fall	Credits	Spring	Credits
MRKTNG 3000	3	ACCTCY 2036	3
Statistics (Recommend ESC_PS 4170)	3	MANGMT 3000	3
T_A_M 2400	3	T_A_M 3281	1
T_A_M 3280	3	T_A_M 4510 (course is changing to TAM 3520 effective SP2014)	3
T_A_M 3380	3	T_A_M 3410 (course is changing to T_A_M 4400 effective SP2014)	3
		T_A_M 3480 (or General Elective )	3
	15		16

Fourth Year			
Fall	Credits	Spring	Credits
T_A_M 4480 (or General Elective )	3	T_A_M 4110	3
Business Elective or Art Course	3	T_A_M 4980	4
HES Foundation	3	Humanities	3
General Elective	4	General Elective	3
	<b>13</b>		<b>13</b>
Total Credits: 120			

## Bachelor of Science in Human Environmental Sciences with a track in International Apparel Product Development

First Year			
Fall	Credits	Spring	Credits
ENGLISH 1000	3	MATH 1100	3
CHEM 1100	3	NUTR_S 1034 or 1340 (Recommended Biological Science Course)	3
GN_HES 1100	1	History or Government	3
T_A_M 1100	3	T_A_M 2200	3
HES Foundation	3	T_A_M 2280	4
T_A_M 1200	3		
	<b>16</b>		<b>16</b>
Second Year			
Fall	Credits	Spring	Credits
ECONOM 1014 or AG_EC 1041	3	ECONOM 1015 or AG_EC 1042	3
Foreign Language	5	Foreign Language	5
T_A_M 2380	3	COMMUN 1200	3
T_A_M 2480	3	T_A_M 1300	3
T_A_M 2500	3	T_A_M 2580	3
	<b>17</b>		<b>17</b>
Third Year			
Fall	Credits	Spring	Credits
MRKTNG 3000 or MANGMT 3000	3	ACCTCY 2036	3
Statistics (Recommended ESC_PS 4170)	3	GEOG 1550 or 3780	3
T_A_M 2120	1	T_A_M 3281	1
T_A_M 2400	3	T_A_M 4510 (course is changing to TAM 3520 effective SP2014)	3
T_A_M 3280	3	T_A_M 3480 (or General Elective )	3
T_A_M 3380	3		
	<b>16</b>		<b>13</b>
Fourth Year			
Fall	Credits	Spring	Credits
PHIL 1100	3	T_A_M 4110	3
POL_SC 1400	3	T_A_M 3410 (course is changing to T_A_M 4400 effective SP2014)	3
HES Foundation	3	T_A_M 4980	4

T_A_M 4480 (or General Elective )	3	Humanities	3
	<b>12</b>		<b>13</b>
Total Credits: 120			

## Minor in Textile and Apparel Management

An undergraduate minor in Textile and Apparel Management is available for students pursuing a major in other departments. Students who wish to complete a minor should declare the minor by completing the form at [http://hes.missouri.edu/students\\_minorapp.html](http://hes.missouri.edu/students_minorapp.html). A minimum of 18 credit hours is required with at least six hours at the 2000 level or above. Prerequisites for all courses must be met, or the student must have the permission of the instructor. Below are the required hours by content area.

### Apparel Industry Studies (Select 6 hours from the list below)

General Courses Related to Textile and Apparel Industry		
T_A_M 1100	Introduction to the Textile and Apparel Industry	3
T_A_M 2400	Global Consumers	3
T_A_M 3200	Softgoods Quality Evaluation	3
T_A_M 3700	MultiChannel Retailing in the Digital World	3
T_A_M 4110	Global Sourcing	3
T_A_M 3410	The Clothing/Textile Consumer: Research and Analysis (course is changing to T_A_M 4400 effective SP2014)	3
T_A_M 4549	International Experiential Learning in Textiles and 1-99 Apparel	1-99
T_A_M 4949	Field Training in Textiles and Apparel Management	1-99
T_A_M 4998	Experiential Learning in Textiles and Apparel	1-99
Apparel Merchandising & Retailing Focused Courses		
T_A_M 1300	Softgoods Retailing	3
T_A_M 2300	Retail Finance and Merchandise Control	3
T_A_M 4300	Softgoods Brand Management	3
T_A_M 4990	Retail Marketing and Merchandising	3
Apparel Product Development Focused Courses		
T_A_M 1200	Basic Concepts of Apparel Design and Production	3
T_A_M 2280	Apparel Production	4
T_A_M 2380	Integrated Apparel Design and Production I	3
T_A_M 2480	Apparel and Textile Presentation Techniques	3
Textiles (Required)		
T_A_M 2200	Science of Textiles	3
Historical/Behav. St. in Dress (Select 3 hours from the list below)		
T_A_M 2500	Social Appearance in Time and Space	3
T_A_M 3510	History of Western Dress	3
Specialty Area (Select 6 hours)		
T_A_M 4510	19th and 20th Century Western Dress (course is changing to T_A_M 3520 effective SP2014)	3

These courses are to be selected in consultation with a T A M advisor, and should come from the list above.

## Graduate

### MA in Textile and Apparel Management

#### Admission Contact Information

Leona Nichols (nicholslm@missouri.edu)  
 137 Stanley Hall; Columbia, MO 65211  
 573-882-7317  
[http://tam.missouri.edu/academics\\_grad.html](http://tam.missouri.edu/academics_grad.html)

#### Admission Criteria

Fall deadline: February 1 (January 15 for early financial support considerations)  
 Spring deadline: June 1  
 Summer deadline: October 1

- Minimum GPA: 3.0 in last 60 hours
- Bachelor's degree from an accredited college or university in textile and apparel management or related field. Those with unrelated majors will need to do make-up work
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	500 500
On or After August 1, 2011	153 144 variable

#### Required Application Materials

To the Graduate School:

- All required Graduate School documents
- Statement of professional objectives (upload to application)
- Departmental application (upload through the Graduate School application or send directly to department)
- Three letters of recommendation (upload preferred, or send directly to department)
- GRE Scores
- TOEFL scores if international student

### MS in Textile and Apparel Management

#### Admission Contact Information

Leona Nichols (nicholslm@missouri.edu)  
 137 Stanley Hall; Columbia, MO 65211  
 573-882-7317  
[http://tam.missouri.edu/academics\\_grad.html](http://tam.missouri.edu/academics_grad.html)

#### Admission Criteria

Fall deadline: February 1 (January 15 for early financial support considerations)  
 Spring deadline: June 1

Summer deadline: October 1

- Minimum GPA: 3.0 in last 60 hours
- Bachelor's degree from an accredited college or university in textile and apparel management or related field. Those with unrelated majors will need to do make-up work
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
79	550

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	500	
On or After August 1, 2011	153 144 variable	

#### Required Application Materials

To the Graduate School:

- All required Graduate School documents
- Statement of professional objectives (upload to application)
- Departmental application (upload through the Graduate School application or send directly to department)
- Three letters of recommendation (upload preferred, or send directly to department)
- GRE Scores
- TOEFL scores if international student



## Additional Minors and Certificates - HES

### Undergraduate

- Minor in Financial Literacy for Helping Professionals (p. 545)
- Minor in Social Justice (p. 545)

### Graduate

- Certificate in Financial and Housing Counseling (p. 546)
- Certificate in Geriatric Care Management (p. 546)
- Certificate in Gerontology (p. 546)
- Certificate in Youth Development Specialist (p. 546)
- Certificate in Youth Development Program Management and Evaluation (p. 546)

## Undergraduate

### Minor in Financial Literacy for Helping Professionals

The School of Social Work has collaborated with Personal Financial Planning department within the College of Human Environmental Sciences to develop a minor in Financial Literacy for Helping Professionals. As front line helping professionals encounter clients who face challenging economic situations, skills in addressing those challenges and knowledge of foundational personal finance information will aid in helping clients. Knowledge of predatory lending practices, social welfare policy designed to help the working and non-working poor and tax strategies to enhance financial situations will be addressed. This minor hopes to embrace the imperative need to educate our graduates on the role of financial literacy for those professionals who will serve others.

Students who complete the financial literacy minor may not refer to themselves as BSW-level social workers upon graduation. Fifteen credits are required to complete the financial literacy minor.

#### Minor Requirements

FINPLN 2183	Personal and Family Finance *	3
FINPLN 3282	Financial Counseling *	3
FINPLN 4188	Community Agencies and Volunteerism (taught in spring semester only; students will need to attend workshop in order to certify for IRS compliance)	3
SOC_WK 4750	Interaction Skills Workshop	3
Select one of the following:		3
SOC_WK 2000	Exploration in Social and Economic Justice	
SOC_WK 4710	Social Justice and Social Policy	
<b>Total Credits</b>		<b>15</b>

\* Completion of these two courses, as well as the proposed curriculum for the minor, will allow the student to sit for the Accredited Financial Counselor Exam.

Note: Satisfactory completion (as defined by C range grade or above) of Microeconomics and College Algebra is required. Satisfactory completion (as defined by C range grade or above) of each required course is necessary in order to attain this minor. This minor is available to students regardless of major.

### Minor in Social Justice

The social justice minor is designed to give non-social work majors the opportunity to develop knowledge and understanding about social justice in the person-environment context. Social justice involves the idea that in a perfect world all citizens would have identical social benefits, protections and opportunities regardless of their backgrounds and membership in diverse groups. Recognizing that the world is not perfect, the primary goals for the minor in social justice are to enhance sensitivity to vulnerable and at-risk populations, to provide opportunity for critical review of social policies and the allocation of societal resources and to stimulate interest in advocacy and the planned change process.

Students who complete the social justice minor may not refer to themselves as BSW-level social workers upon graduation.

A minimum of 15 credits, comprised of the courses below, is required to complete the social justice minor.

#### Minor core requirements

SOC_WK 1115	Social Welfare and Social Work	3
SOC_WK 2220	Human Behavior and the Environment	3
SOC_WK 2000	Exploration in Social and Economic Justice	3
or SOC_WK 4710	Social Justice and Social Policy	

#### Social work electives

Select two of the following:		6
SOC_WK 4101	Topics in Social Work	
SOC_WK 4330	Addiction Treatment and Prevention	
SOC_WK 4350	Deaf Culture: A Social Work Perspective	
SOC_WK 4360	Working with Minority Youth	
SOC_WK 4370	Delinquency, Corrections and Social Treatment	
SOC_WK 4380	Social Work Practice With Minorities: African-American Emphasis	
SOC_WK 4390	Helping Strategies With Children and Adolescents	
SOC_WK 4400	Domestic Violence	
SOC_WK 4410	Law and Social Work Practice	
SOC_WK 4440	International Social Work Practices and Principles	
SOC_WK 4450	Professional Perspectives on Child Welfare Services in the 21st Century	

SOC_WK 4455	Latino/a Immigrants and Receiving Communities
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Total Credits	15
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## Graduate

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### Graduate Certificate in Financial and Housing Counseling

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The purpose of the Financial and Housing Counseling Certificate is to develop a student's financial and housing counseling skills and to prepare a student to sit for the Accredited Financial Counselor and Certified Housing Counselor exam offered through the National Association for Financial Planning and Counseling Education. Students with this background would be equipped to provide professional assistance in debt counseling, financial management, and housing finance to those in need. Typical clients would include those with low levels of income and resources, disaster recovery, and military personnel dealing with financial and housing issues related to deployment, relocation.

This certificate is offered as part of the Family Financial Planning programs in the Great Plains Interactive Distance Education Alliance. More information is available at <http://www.gpidea.org/index.html?page=majorsDegreesCourses.html&anchor=programAnchor1>.

Contact information:  
Dr. Deanna Sharpe  
229 Stanley Hall  
Columbia, MO 65211  
[sharped@missouri.edu](mailto:sharped@missouri.edu)  
573-882-9652

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### Graduate Certificate in Geriatric Care Management

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The Geriatric Care Management certificate is a web-based, four course certificate designed for those who provide independent case management services to elder Americans or who wish to do so in the future. The certificate provides an educational credential in addition to preparing students to sit for certification examinations given by national credentialing organizations.

For more information about certificate, contact:  
Dr. Cynthia S. Reeser  
Department of Human Development and Family Studies  
College of Human Environmental Sciences  
314 Gentry Hall  
Columbia, MO 65211  
573-882-5617  
[reeserc@missouri.edu](mailto:reeserc@missouri.edu)

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### Graduate Certificate in Gerontology

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A certificate in gerontology is ideal for professionals in a variety of aging-related fields. Areas include senior-services organizations like centers on aging; senior centers; nursing homes; assisted, independent, and aging-

in-place living facilities; non-profit organizations; faith-based groups; and extension educators.

Certificate web site: [http://hdfs.missouri.edu/grad\\_gerontologycertificate.html](http://hdfs.missouri.edu/grad_gerontologycertificate.html)

For information about certificate, contact:  
Department of Human Development and Family Studies  
314 Gentry Hall  
University of Missouri  
Columbia, MO 65211  
[colemanma@missouri.edu](mailto:colemanma@missouri.edu)  
573-882-4035

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### Graduate Certificate in Youth Development Program Management and Evaluation

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A certificate in Youth Development Program Management and Evaluation is ideal for professionals in a variety of youth-related fields. Areas include youth-serving organizations like 4-H; Boys and Girls Club; non-profit organizations; faith-based groups; community recreation facilities; correctional professions; elementary, middle and high school educators; and extension educators.

Certificate web site: [http://hdfs.missouri.edu/grad\\_youthprogram.html](http://hdfs.missouri.edu/grad_youthprogram.html)

For information about certificate, contact:  
Department of Human Development and Family Studies  
College of Human Environmental Sciences  
314 Gentry Hall  
Columbia, MO 65211  
[colemanma@missouri.edu](mailto:colemanma@missouri.edu)  
573-882-4360

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### Graduate Certificate in Youth Development Specialist

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A certificate in youth development is ideal for professionals in a variety of youth-related fields. Areas include youth-serving organizations like 4-H; Boys and Girls Club; non-profit organizations; faith-based groups; community recreation facilities; correctional professions; elementary, middle and high school educators; and extension educators.

Certificate web site: [http://hdfs.missouri.edu/grad\\_youthspecialist.html](http://hdfs.missouri.edu/grad_youthspecialist.html)

For information about certificate, contact:  
Department of Human Development and Family Studies  
College of Human Environmental Studies  
314 Gentry Hall  
Columbia, MO 65211  
[colemanma@missouri.edu](mailto:colemanma@missouri.edu)  
573-882-4360

## School of Journalism

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### Administration

Dean Mills, Dean  
Esther Thorson, Associate Dean for Graduate Studies  
Lynda Kraxberger, Associate Dean for Undergraduate Studies and Administration  
Fritz Cropp, Associate Dean for Global Programs

### Contact Information

Advising Contact: (573) 882-1045  
Scholarship Information Contact: <http://journalism.missouri.edu>

Office Address  
Administration, 120 Neff Hall  
(573) 882-4821  
Student Services, 76 Gannett Hall  
(573) 882-1045  
[JournalismStudentServices@missouri.edu](mailto:JournalismStudentServices@missouri.edu)

### About the School

The world's first School of Journalism was established in 1908 at the University of Missouri to strengthen the effectiveness of public communication in a democratic society. The school's first dean, Walter Williams (who went on to become president of the University in 1930) wrote the Journalist's Creed, which stresses the profession's rights and responsibilities as a public trust.

The faculty is committed to educating students in the responsibilities and skills of the professional journalist. It also has a broader commitment to advance the profession of journalism through scholarly research, analysis and criticism and through special programs to serve practitioners. The school also prepares students for careers in corporate communication through its strategic communication emphasis area. Students in that area typically pursue careers in advertising or public relations or in strategic communication, a combination of those fields.

The Missouri Plan assures a journalism graduate the broad, liberal education essential for a journalist whose work may span many segments of today's complex society. In addition to a liberal arts education, students complete practical laboratory work in a variety of settings, including a public radio station, a commercial daily newspaper and a network-affiliated television station. The school offers the Bachelor of Journalism, Master of Arts and Doctor of Philosophy degrees, along with cooperative programs with other divisions in the University. It was the first school in the world to offer all three of those degrees.

The Accrediting Council on Education in Journalism and Mass Communication has accredited the undergraduate program and a professional master's degree.

### Undergraduate

- Admissions
- Required Entry-Level Courses
- Special Programs
- Academic Regulations
- Advising
- Opportunities for Graduate Study on MU Campus

### Admissions

(Effective Fall Semester 2013)

Students must be admitted to the School of Journalism to pursue the Bachelor of Journalism degree. Students are admitted in one of two categories:

#### Directly Admitted Students

A freshman applicant will be directly admitted to the School of Journalism if he or she meets standard MU admissions requirements and any one of the following three criteria:

- Ranks in the top 10 percent of his or her high school class.
- Scores 29 or higher on the ACT Composite.
- Scores 1290 or higher on the math-verbal portions of the SAT.

#### Pre-Journalism A&S Students

Students accepted by MU who do not meet one of the criteria for direct admission are admitted as pre-Journalism students in the College of Arts and Science and apply for admission to Journalism as the student is completing the fifth journalism course, which is either JOURN 2100-News or JOURN 2150-Fundamentals of Multimedia Journalism. That usually occurs in the second semester of the sophomore year as the student is completing 60 credits and all other requirements.

NOTE: All undergraduate admissions to MU are handled by the Office of Undergraduate Admissions, not the School of Journalism, and no exceptions are made to the standards for direct admission to Journalism. A student either meets one of the admissions standards or does not. *There is no appeals process for direct admission.*

However, once accepted to MU as a pre-Journalism student, the student may continue to take the ACT or SAT to try to improve his or her score. If the student receives the necessary score for direct admission, once the score is received by the Admissions Office the student may request a change of admissions status. The new test score must be received by the Admissions Office at least one month before the student is to begin classes at MU. Similarly, a student who was admitted outside the top 10 percent of his or her class but who subsequently achieves top 10 percent standing at the end of the senior year of high school may request a change of admissions status. *No change is possible later than one month before the student begins classes at MU.*

#### Differences in the Admission Categories

Directly admitted students have several advantages over students admitted as pre-Journalism students in the College of Arts and Science. Directly admitted students:

- Advance automatically to upper-class status in Journalism if they maintain a cumulative UM GPA of record of 3.0 or higher upon completion of 60 credit hours and fulfill all other requirements.
- Are guaranteed admission to the upper-class interest area of their choice provided they maintain a cumulative UM GPA of record of 3.0 or higher.
- Have access to a far larger portion of the School of Journalism's freshman scholarship pool. The School of Journalism annually awards more than \$450,000 in scholarships in addition to scholarships awarded by the Admissions Office and others. To apply for all scholarships, including those offered by the School

of Journalism, apply through the Office of Financial Aid (<http://financialaid.missouri.edu/index.php>). Priority consideration is given to those who apply by Dec. 1.

To continue to enjoy these benefits, directly admitted students are expected to maintain a UM cumulative GPA of 3.0 or higher. Those without GPAs of at least 3.0 after completion of 60 credit hours lose these benefits and will be placed in a pool with pre-Journalism students and considered individually for upper-class status through a process outlined below.

Unlike directly admitted students, pre-Journalism A&S students:

- Are not guaranteed to advance to upper-class status in Journalism if they maintain a cumulative UM GPA of record of 3.0 or higher upon completion of 60 credit hours and after fulfilling all other requirements. Students in this category instead are accepted on a space-available basis. However, to date no one who has earned a 3.0 cumulative GPA or higher has been rejected, and space has been available. The School merely reserves the right to reject students should overcrowding occur in the future.
- Are not guaranteed an interest area of choice even with a cumulative GPA of record of 3.0 or higher. Admission to the interest area of choice is dependent upon space availability. To date, no one with a 3.0 GPA or higher has been denied admission to an area of choice.
- Have access to fewer scholarships from the School of Journalism. The school has only four scholarships available to pre-Journalism Arts and Science students. That's because most scholarships are designated for "Journalism students," and pre-Journalism A&S students have not yet been accepted to the School of Journalism. To apply for all scholarships, including those offered by the School of Journalism, apply through the Office of Financial Aid (<http://financialaid.missouri.edu/index.php>).

The School of Journalism is eager to accept hard-working pre-Journalism students who have demonstrated aptitude and drive into upper division interest areas of our program.

## Admission to Upper-Division Interest Area

As noted above, directly admitted students who maintain a UM GPA of record of 3.0 or higher and complete the necessary coursework are automatically admitted to upper-division status and their interest area of choice upon completion of 60 credits and other requirements for upper-division status.

Students who do not meet the criteria for direct admission and directly admitted students who have not maintained a cumulative UM GPA of record of 3.0 or higher must apply for upper-division status upon completion of 60 credit hours and fulfillment of all other requirements for upper-division status. Committees of faculty in each emphasis area will review applications for admission, and admission will be by interest area based on space available in that program.

GPA alone will **not** be used to evaluate the applications of pre-Journalism students and directly admitted students with UM GPAs below 3.0. In addition to GPA, the committees will consider a student's stated desire to work in the fields of journalism or strategic communication, demonstrated commitment to journalism or strategic communication (as evidenced by work with student or professional media, high school activities or participation in journalism student groups), needs of the profession, etc. For example, it is possible for a student with a 2.87 GPA who has demonstrated strong commitment to the field to be selected over one with a 2.95 GPA who has shown no similar commitment. Students applying

through this process must submit brief letters of application (not to exceed two pages) stating a case for admission to an interest area.

The School will attempt to match interests of students applying through this process with openings in the School's various academic disciplines. The School does not guarantee first choice of interest area to students admitted through this process. It may be necessary from time to time to limit enrollment in high-demand areas.

Students who are rejected for upper-division status through this process must transfer to another MU division and will no longer be considered Journalism or pre-Journalism students. If, however, a student subsequently spends a semester taking non-journalism courses and raises his or her cumulative GPA of record above 3.0, the student may reapply. No such application will be accepted after a student has completed 70 or more hours of college credit.

## Transfer Student Admissions Standards

Transfer students are admitted to upper-division status in Journalism when they complete 60 credit hours, fulfill all prerequisites and establish a cumulative GPA of record of at least 3.0. Completion of at least three terms at MU is required for transfer students to qualify for admission. Because of that, students who plan to major in Journalism are encouraged to transfer to MU after taking no more than 30 credit hours elsewhere.

Transfer students who have completed 60 credit hours and the necessary coursework but who do not have a 3.0 UM GPA of record are placed in the same pool of applicants as pre-Journalism students and will be considered using the same process. Criteria used in evaluating these applications are similar to those for pre-Journalism applicants and direct admits who do not maintain 3.0 GPAs. The Admissions Committee will review the student's GPA of record as well as a student's stated desire to work in the fields of journalism or strategic communication, demonstrated commitment to journalism or strategic communication (as evidenced by work with student or professional media, high school or community college activities, or participation in journalism student groups), needs of the profession, etc. A transfer student in this category also must submit a brief letter of application (not to exceed two pages) stating a case for admission.

Unless otherwise specified by a formal articulation agreement that allows additional hours, up to 64 credits may be transferred from two-year colleges at any time before graduation. Students must also complete 30 of their last 36 hours in MU coursework. The Office of Undergraduate Admissions, not the School of Journalism, determines transfer equivalencies for the University. Transfer students from other accredited schools and colleges in Missouri should check the MU website to see how coursework will transfer to MU or contact the Office of Admissions. Students also should contact an advisor to see how these courses would apply toward a degree at MU. The School of Journalism may accept up to six journalism credit hours transferred from other accredited journalism programs or from Missouri colleges with which the school of Journalism has working agreements. The six credits eligible for transfer are those that equate to Principles of American Journalism, Cross-Cultural Journalism, News, Multimedia Journalism, History of American Journalism and Communications Law. Other courses may be accepted on a case-by-case basis by the Associate Dean for Undergraduate Studies. Current Missouri journalism students may not transfer journalism credits from other institutions. Many communications courses are similarly rejected and may not be used toward graduation requirements even as electives. Some other

courses may not count toward the degree. See the *Undergraduate Handbook* (<http://journalism.missouri.edu/wp-content/uploads/2012/12/handbook-2012.pdf>) for additional guidance.

## Transfer Credit

The Office of Undergraduate Admissions, 230 Jesse Hall, determines transfer equivalencies for the University, including the School of Journalism.

The School of Journalism accepts transfer credit according to the transfer credit equivalency report. Transfer credit from two-year colleges can transfer only as lower-level credit.

The School of Journalism accepts a maximum of six transfer credits from other schools accredited by the Accrediting Council on Education in Journalism and Mass Communications. It also accepts journalism credits from those two-year colleges with which the School has articulation agreements.

Transfer students from other accredited schools and colleges in Missouri should check the website of the Office of Undergraduate Admissions to see how course work will transfer to MU.

## International Admission

A minimum score of 100 (internet), 600 (paper) or 250 (computerized) on the Test of English as a Foreign Language (TOEFL) is required for all pre-Journalism and Journalism students whose native language is other than English. Alternatively, students may take the International English Language Testing System (IELTS) exam: overall-7.0, no band below-6.0.

## Required Entry-Level Courses

Prior to admission to an interest area in the School of Journalism, the student must complete a course of study that includes at least 60 credits of work at MU or another accredited two- or four-year institution. The courses listed below are required for students to be admitted to an interest area in journalism.

### English Composition (3 credits):

- (3 credits) with a grade of "B" or better OR a grade of "C" and a satisfactory score on the Missouri College English Test. AP and IB test credit may satisfy this requirement.

### College Algebra (3 credits):

- MATH 1100 College Algebra with a C- range grade is required, or an exemption from College Algebra.

### Foreign Language (12-13 credits):

- Unless students have completed four or more years in a single foreign language in high school, they must complete 12-13 credits in a single foreign language at the college level.
- The final 3-credit course may be taken the first semester in an interest area in the School of Journalism. In this case, it will count as elective credit. Placement and proficiency exams are available in French, German and Spanish.
- If you have four or more years of high school credit and elect to take a lower-level course in the same language, you negate the option of satisfying your language requirement based on high school credit. You must either continue through level 3 or request that the credits for the lower-level course not be counted toward graduation.

### Biological, Mathematical and Physical Science (9 credits):

- Statistics (3 credits): STAT 1200 Introductory Statistical Reasoning, STAT 1300 Elementary Statistics or its equivalent in transfer may be accepted.
- Additional courses (6 credits) from the following areas: biological anthropology, astronomy, biology, chemistry, CMP\_SC 1050 Algorithm Design and Programming I, geology, math and physics. One course must include a lab.
- Note that College Algebra, with a C-range grade, must be the prerequisite for math courses counting in the science area. MATH 1140 Trigonometry, counts as general elective credit only.

### Social and Behavioral Science (14 credits):

- American History: HIST 1100, HIST 1200, HIST 1400, HIST 1410, HIST 2210 or HIST 2440
- American Government OR State Government: POL\_SC 1100 or POL\_SC 2100.
- Economics: ECONOM 1051/ECONOM 1051H OR ECONOM 1014 AND ECONOM 1015, OR AG\_EC 1041 and AG\_EC 1042
- A 3-credit behavioral science course

Note that ECONOM 1014 is the prerequisite for ECONOM 1015

### Humanistic Studies (6 credits):

- Any literature course, including foreign language literature courses.

### Additional courses (3 credits):

- Communication/film studies/theatre
- History or appreciation of art or music
- Humanities
- Non-US civilization or classics
- Philosophy
- Religious studies

### Journalism (13 credits, effective fall semester 2013):

- JOURN 1010 Career Explorations in Journalism (1 credit). Should be taken the first semester on campus. Graded S/U.
- JOURN 1100 Principles of American Journalism  
Restricted to first-time college students with a high school core GPA of 3.00 or higher and 15 college credits (dual, AP, IB or other), or current students with 15 completed credits and UM GPA of 2.75. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism students only.
- JOURN 2000 Cross-Cultural Journalism  
Sophomore standing required. Prerequisites: JOURN 1100 and UM GPA of 2.8. Should be taken concurrently with JOURN 2100 or JOURN 2150. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism students only.
- JOURN 2100 News  
Sophomore standing required. Prerequisites: ENGLISH 1000 with a B- grade or higher, JOURN 1100 and UM GPA of 2.8. May NOT be taken concurrently with JOURN 2150. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism students only.
- JOURN 2150 Fundamentals of Multimedia Journalism  
Sophomore standing required. Prerequisites: JOURN 1100 and UM GPA of 2.8. May NOT be taken concurrently with JOURN 2100. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism students only.

## Laptop Computer Requirement

Journalism courses require the use of a computer. Students must demonstrate word-processing proficiency. Incoming freshmen and transfer students are required to have a wireless laptop computer for their work in the School of Journalism.

## Special Programs

The School of Journalism attracts some of the best students at MU. The School encourages high-ability students to enroll in the MU Honors College (<http://honors.missouri.edu>) and take honors courses whenever possible. Such courses are taught by some of MU's best professors. The School recognizes incoming high-ability students with two special designations and the following benefits:

### Journalism Scholars Program

**Qualifications:** Any incoming freshman journalism major who has a composite ACT score of 29 or higher (or 1290 or higher on the combined math and verbal portions of the SAT) and who ranks in the top 10 percent of his or her high school graduating class qualifies for:

- Direct admission to the Missouri School of Journalism
- Designation as a Missouri Journalism Scholar
- Student's who are eligible for the Honor's College are automatically accepted into the Journalism Scholars program

#### Benefits:

- The opportunity to participate in a Freshman Interest Group designed exclusively for Journalism students, space permitting
- Special advisement and programs directed by the school of Journalism's associate dean for undergraduate studies and administration
- Regular meetings with various members of the journalism faculty
- Space permitting, assignment to residence halls set aside for Journalism Scholars
- The opportunity to participate in many on-campus journalism events, and journalism clubs and organizations
- Social activities planned exclusively for Journalism Scholars

### The Walter Williams Scholars Program

The highest-achieving Journalism Scholars win separate designation as Walter Williams Scholars. The Walter Williams Scholars program is named in honor of the school's founding dean, a Missouri newspaper publisher who went on to become president of the University of Missouri.

**Qualifications:** To win acceptance into the exclusive circle of top Walter Williams scholars, incoming freshmen must earn an ACT composite score of 33 or higher (1440 or higher on the SAT). They also must rank in the top 20 percent of the high school class (if the school ranks) or must have maintained a high school GPA of at least 3.25 on a 4.0 scale. Admission is by invitation only.

#### Benefits:

Walter Williams Scholars are also Journalism Scholars and have all of the rights and privileges enjoyed by that group. Additional benefits include:

- Placement in a special Freshman Interest Group, space permitting
- Assigned individual faculty mentors

- A \$1,000 scholarship that can be used for study abroad or in our New York or Washington programs. The scholarship can be used at any time before graduation
- Automatic admission to the one-year BJ/MA program at the School of Journalism, which allows students to complete their graduation degrees in one year rather than two. Admission is contingent upon the following criteria:
  - Maintenance of a 3.25 GPA in your journalism coursework and for your cumulative average, throughout your undergraduate career
  - Submission of a complete MA application, including payment of the application fee, and with two (out of three) of your letters of recommendation from journalism faculty. You do not need to take the GRE. Details can be found on the Master's Application Checklist: <http://journalism.missouri.edu/programs/masters/admissions/>

## Academic Regulations

### Dual-Degree - Bachelor of Arts/Bachelor of Journalism

To receive two bachelor's degrees, a Bachelor of Arts and a Bachelor of Journalism, a student must complete a minimum of 132 credits and complete all of the specific requirements for both degrees. Normally, a minimum of one additional semester is required for both degrees. Each candidate for a dual degree is assigned an advisor in the School of Journalism and in the department of major interest in the College of Arts and Science.

### Science and Agricultural Journalism

The College of Agriculture, Food and Natural Resources, in cooperation with the School of Journalism, offers an inter-divisional Bachelor of Science degree in Science and Agricultural Journalism. This is not considered a dual degree. For more information, see the College of Agriculture, Food and Natural Resources (p. 31) in this catalog.

### Credit Restrictions

Students may enroll in a maximum of 10 journalism credits each semester without permission from the associate dean for undergraduate studies.

### Academic Assessment

Students in convergence, magazine, photojournalism, print and digital news, and Radio-TV news must compile a portfolio prior to graduation showing their preparedness for employment or graduate education. This is a requirement for graduation. Information about the assessment process is sent to students from their faculty chair during their final semester in school. Strategic communication students must complete this requirement as part of the capstone course.

### Independent Study

Mizzou Online offers a variety of courses that can be taken on your own through correspondence or online. Many of the courses can be used to satisfy degree requirements. Students may enroll themselves for as many as 3 hours per semester of online semester based or self-paced (9 months) courses. Any more than 3 hours per semester will have to be approved by an academic advisor.

## Standards for Academic Performance

The School of Journalism is a competitive environment in which students are expected to maintain high standards of academic achievement.

In general, the faculty expects each student to maintain a grade point average of 3.0 or higher to be considered in good standing. The faculty has established rules for handling students who fall below that level.

Those rules follow:

1. A student admitted directly to the School of Journalism as a freshman must maintain a cumulative GPA of record of at least 2.5 during the first 29 hours of credit. The credits applicable in this sense are all credits earned in any way, including transfer, advanced placement and credit by examination. Grades in courses taken elsewhere will not be considered for this purpose. Those who do not meet the standard will be dismissed from the School of Journalism and will not be permitted to re-enroll.
2. A student admitted directly to the School of Journalism as a freshman must maintain a cumulative GPA of record of at least 2.75 after completion of 30 to 70 hours of credit. The credits applicable in this sense are all credits earned in any way, including transfer, advanced placement and credit by examination. Grades in courses taken elsewhere will not be considered for this purpose. Those who do not meet the standard will be dismissed from the School of Journalism and will not be permitted to re-enroll.
3. Students with 70 credits who have still not earned admission to the School of Journalism will be dismissed from the School of Journalism. The credits applicable in this sense are all credits earned in any way, including transfer, advanced placement and credit by examination.
4. Directly admitted freshmen with 70 credits who have still not earned admission to an emphasis area will be dismissed from the School of Journalism. The credits applicable in this sense are all credits earned in any way, including transfer, advanced placement and credit by examination.
5. Students must repeat any required journalism course in which they do not earn a grade of C- or higher.

## Probation, Suspension and Dismissal

Journalism students are placed on probation when either their journalism or their overall (term or cumulative) grade point average falls below 2.0. Students may remain on probation no more than one term. They regain good standing when their term and cumulative grade point averages, for journalism and overall, climb to 2.0 or higher.

First semester freshman journalism students are placed on final probation when their first term grade point average falls between 0.50 - 1.99. Students may remain on final probation no more than one term. They regain good standing when their term and cumulative grade point averages climb to 2.0 or higher.

First-semester freshman journalism students are dismissed and become ineligible to enroll for a period of one calendar year when their first- term grade point average is below 0.50.

Students may be placed on academic probation and may be declared ineligible to enroll if they neglect their academic duties.

Students are suspended and become ineligible to enroll for a period of one regular semester when their term grade point average (journalism or overall) is below 1.5, when they pass less than one-half of their work

in any term or when they are on probation and their term grade point average is 2.0 or lower.

Students are dismissed and become ineligible to enroll for a period of one calendar year when their term grade point average (journalism or overall) is below 1.0, when they pass less than one-fourth of their work in any term or when they fail to perform their academic duties.

A student may be placed on probation, suspended or dismissed for excessive in-completes at the discretion of the associate dean for undergraduate studies. In such cases, the associate dean shall set a time limit for successful completion of all the courses in which the student has an incomplete. That time limit shall be no more than one calendar year from the scheduled completion of the course and may be a shorter duration. The associate dean also may place limitations on the number of additional credit hours in which the student may enroll before the in-completes are resolved. If the student fails to finish the required courses within the time limit set by the associate dean, the student is subject to dismissal.

A student who fails to achieve an acceptable grade (C- or better) in a required journalism course for the second time will be permanently dismissed from the School of Journalism for lack of acceptable progress toward the degree. That student may be readmitted only with the consent of the faculty chair of the student's emphasis area and the associate dean for undergraduate studies. Before recommending approval for the student to re-enroll, the faculty chair will consult with the instructor or instructors of record in the required course to determine the likelihood of that student passing the course on the third attempt. The faculty chair then will make a recommendation to the associate dean, who shall make the final decision to readmit or deny admission to the School of Journalism.

A student who fails to achieve an acceptable grade (C- or better) in two or more required journalism courses may be placed on probation, suspended or dismissed at the discretion of the associate dean for undergraduate studies in consultation with the faculty chair and the instructors of record.

## Satisfactory/Unsatisfactory Grading System

No required course or courses in a required area may be taken on a Satisfactory/Unsatisfactory basis either before or after admission to the School of Journalism. Only elective, non-journalism courses may be taken S/U and only one per semester. Journalism courses offered only as S/U courses are exceptions.

## Ethics of Journalism

The School of Journalism is committed to the highest standards of academic and professional ethics and expects its students to adhere to those standards. Students are expected to observe strict honesty in academic programs and as representatives of school-related media.

Should any student be guilty of plagiarism, falsification, misrepresentation or other forms of dishonesty in assigned work, he or she may be subject to a failing grade from the course teacher and such disciplinary action as may be recommended pursuant to university regulations.

## Non-Journalism Majors

Students from other divisions with junior or higher standing may take non-laboratory courses in journalism without being admitted to the school. Permission of the journalism academic unit is required. Courses directly related to the skills in the media are usually not open to students while they are undergraduates in other disciplines. Students from other schools

or colleges admitted to journalism courses are expected to meet the course prerequisites and grade point averages required of students in the School of Journalism.

## Advising

Students directly admitted to Journalism as freshmen have a full-time academic advisor in the school.

Pre-Journalism students receive academic advising from the College of Arts and Science. Students admitted to an interest area in the school have a full-time academic advisor in the school and a faculty advisor from their selected emphasis area. Students are expected to seek the advice of the academic advisor in the selection of courses. The faculty advisor provides career counseling and specific journalism related issues.

The school provides advising checklists so that students can maintain a record of academic course work. The forms are used by the student and advisor to plan the student's program. Students are responsible for determining an appropriate schedule of courses each semester; however, the course schedule should be approved by the student's advisor. The responsibility for meeting admission and graduation requirements rests with the student.

## Opportunities for Graduate Study on MU Campus

The five-year combined bachelor/master degree program was designed for students in the Missouri School of Journalism who desire a graduate education after the undergraduate program is complete. Students in the program complete requirements as outlined for the Bachelor of Journalism degree and then spend one more year (approximately 12 months) to earn a master's degree. The program requires students to carry an intensive load (12-15 credits) each semester. Course work in the program builds on the undergraduate program and enhances student's skills and understanding of the chosen area of journalism. At the present time, students can focus their program in areas such as strategic communication, newspaper design, broadcast management, computer-assisted reporting and magazine areas such as magazine writing and magazine design.

## Graduate

### About Our Graduate Programs

The University of Missouri's School of Journalism is the recognized leader for graduate study in journalism and strategic communication, having awarded the first master's and doctoral degrees in journalism in 1921 and 1934, respectively.

The Missouri Method is the time-honored process of journalism and strategic communication education: Graduate students gain valuable research-based, managerial experience while honing tactical skills. We operate the only network affiliate (NBC) television station in the country used to train journalism students. We publish a community daily newspaper (not a campus paper), and we operate four major web sites, a local magazine and an international magazine. Students also may train at our campus-based NPR affiliate. Our strategic communication students design media campaigns for local and national clients. Examples: Our students have created advertising and public relations campaigns for Nokia, Apple, Dr Pepper, Anheuser-Busch, Duncan Hines, DuPont, Dow

Chemical, Kinko's, Eastman Kodak and many other leading international brands. Graduate studies in CAFNR are taking an innovative, high-tech approach to traditional agriculture, food and natural resources. Our students are highly engaged with expert faculty mentors who are impacting the future with findings on health breakthroughs, sustainable agriculture techniques and food safety. Prospective students are able to choose from a range of academic programs consistently recognized for excellence.

Note: Prospective graduate students must apply to both the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

We operate educational programs in Washington, D.C., New York, and Brussels where many of our students carry out their capstone projects or do research. We also partner with educational programs around the world.

Our 80+ faculty members have earned impressive credentials from years of working in journalism and strategic communication. School resources include an extensive journalism library and Freedom of Information Center, Center for Advanced Social Research, and the Stephenson Research Center, named for the late William Stephenson, known globally as the inventor of Q-methodology.



## Journalism

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The world's first School of Journalism was established in 1908 at the University of Missouri to strengthen the effectiveness of public communication in a democratic society. The school's first dean, Walter Williams (who went on to become president of the University in 1930) wrote the Journalist's Creed, which stresses the profession's rights and responsibilities as a public trust.

The faculty is committed to educating students in the responsibilities and skills of the professional journalist. It also has a broader commitment to advance the profession of journalism through scholarly research, analysis and criticism and through special programs to serve practitioners. The school also prepares students for careers in corporate communication through its strategic communication emphasis area. Students in that area typically pursue careers in advertising or public relations or in strategic communication, a combination of those fields.

The Missouri Plan assures a journalism graduate the broad, liberal education essential for a journalist whose work may span many segments of today's complex society. In addition to a liberal arts education, students complete practical laboratory work in a variety of settings, including a public radio station, a commercial daily newspaper and a network-affiliated television station. The school offers the Bachelor of Journalism, Master of Arts and Doctor of Philosophy degrees, along with cooperative programs with other divisions in the University. It was the first school in the world to offer all three of those degrees.

The Accrediting Council on Education in Journalism and Mass Communication has accredited the undergraduate program and a professional master's degree.

## Administration

Dean Mills, Dean

Esther Thorson, Associate Dean for Graduate Studies

Lynda Kraxberger, Associate Dean for Undergraduate Studies and Administration

Fritz Cropp, Associate Dean Global Programs

Advising Contact: (573) 882-1045

Scholarship Information: <http://journalism.missouri.edu>

Office Address

Administration, 120 Neff Hall

(573) 882-4821

Student Services, 76 Gannett Hall

(573) 882-1045

[journalismstudentservices@missouri.edu](mailto:journalismstudentservices@missouri.edu)

## Faculty

### Journalism Studies Faculty

**Professor** D. R. Moen\*

**Professor (Professional Practice)** B. Cochran, D. Mason\*, A. S. McCombs, M. M. Steffens\*

**Librarian III** D. Carner

**Associate Professor** P. R. Brooks\*, S. Craft\*\*, Fritz Cropp, S. A. Davidson\*, E. L. Perry Jr.\*\*

**Associate Professor (Professional Practice)** L. Bruzzese\*, M. Horvit\*

**Assistant Professor** R. Thomas, Y. Volz\*\*, T. Vos\*\*

**Assistant Professor (Professional Practice)** W. Allen\*, B. Horvit

**Professor Emeritus** B. Brooks, G. P. Kennedy\*, E. Lambeth\*, K. P. Sanders\*, B. H. Winfield

**Associate Professor Emeriti** W. Pippert

### Convergence Journalism Faculty

**Professor** R. D. Mills\*

**Professor (Professional Practice)** L. S. Kraxberger\*, A. S. McCombs\*, R. Smith\*

**Associate Professor** M. L. McKean\*

**Assistant Professor (Professional Practice)** K. Mitchell, D. S. Rice, A. Simons\*

**Adjunct Associate Professor** J. Flink\*, J. Spencer

**Adjunct Assistant Professor** A. Wharton

**Rji Editor (Graphis, Multimedia)** R. Stern

**Rji Editor (Video)** O. Kyle\*

**Rji Editor (Analytics)** B. Best\*

### Print and Digital News

**Professor** J. M. Banaszynski\*

**Professor (Professional Practice)** M. M. Jenner

**Associate Professor** C. Bentley\*, T. A. Warhover\*

**Associate Professor (Professional Practice)** J. Abbott\*, G. Bowers\*, E. K. Brixey., D. L. Herzog\*, J. M. Mayer\*, K. Reed\*, J. T. Schneller, S. C. Swafford\*, M. R. Walter\*

**Director and Adjunct Associate Professor** R. Fidler, D. Potter

**Assistant professor (Professional Practice)** L. Johnston\*, E. B. Mendez, Wu, Y.

**Adjunct Assistant Professor** B. Steffens

**Librarian II** N. Johnson

**Adjunct Instructor** R. Weir

**Assistant Instructor** G. Hodder

**Clinical Instructor** R. Jensen

### Magazine Journalism Faculty

**Associate Professor** M. K. Blakely\*, F. B. Hudson

**Associate Professor (Professional Practice)** J. Fennell\*, M. J. Grinfeld\*, J. L. Rowe\*

**Assistant Professor (Professional Practice)** A. Heiss\*

**Assistant Professor** S. S. Hiles, A. Hinnant\*\*,

**Professor Emeritus** S. R. Weinberg\*

**Professor Emeritus (Professional Practice)** S. Loory

**Associate Professor Emeriti** J. L. Colbert

### Photo Journalism Faculty

**Professor (Professional Practice)** D. L. Rees

**Associate Professor (Professional Practice)** J. S. Bell\*, R. Reed\*

**Assistant Professor** K. Greenwood\*\*

**Assistant Professor (Professional Practice)** B. Kratzer

**Adjunct Associate Professor** J. Curley, R. Shaw\*

**Professor Emeritus** C. Z. Smith

### Radio-Television Journalism Faculty

**Professor (Professional Practice)** B. Cochran

**Associate Professor (Professional Practice)** K. S. Collins, G. Grigsby\*, G. Kyle\*, R. A. Reeves\*, A. M. Romero\*, S. Woelfel\*

**Assistant Professor (Professional Practice)** E. Frogge, J. D. Nevalga, J. Saidi\*

**Adjunct Instructor** A. Bailey, E. Blumberg, M. Dunn, R. Famuliner, C. Gervino, S. Hill, J. Riek

**Professor Emeritus** R. A. Gafke\*, R. G. Gelatt

**Associate Professor Emeritus** C. H. Warner

## Strategic Communication Faculty

**Professor** G. T. Cameron\*\*, G. M. Leshner\*\*, E. L. Thorson\*\*

**Professor (Professional Practice)** S. T. Heiman\*, J. Sterling\*

**Associate Professor** P. Bolls\*\*, M. E. Duffy\*\*, C. M. Frisby\*\*, M. Len-Rios\*\*, S. L. Rodgers\*\*, K. Wise\*\*

**Assistant Professor (Professional Practice)** F. Corridori, J. Flink, B. Ifshin\*, S. Padgett, M. Swanson\*, J. Stemmler

**Associate Professor Emeritus** R. Bratek, H. B. Hager\*

**Associate Professor Emeritus (Professional Practice)** S. Kopcha

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

- Department Level Requirements (p. 555)
- BJ in Journalism (p. 556)
  - with emphasis in Convergence Journalism (p. 557)
  - with emphasis in Magazine Journalism (p. 560)
  - with emphasis in Photojournalism (p. 562)
  - with emphasis in Print and Digital News (p. 563)
  - with emphasis in Radio-Television Journalism (p. 568)
  - with emphasis in Strategic Communication (p. 571)
- Minor in Journalism (p. 574)

Undergraduate students in the School of Journalism pursue their degrees in one of six Emphasis Areas approved by the University Board of Curators and the Missouri Coordinating Board of Higher Education. These are Convergence Journalism, Magazine Journalism, Photojournalism, Print and Digital News, Radio-Television Journalism, and Strategic Communication. Degrees are awarded only in one of those six areas.

Each Emphasis Area, however, has separate tracks that permit students to prepare for employment in more specialized fields. These are called Interest Areas, and students select from more than 30 choices among these. Interest Areas do not appear on transcripts or diplomas, although the transcript coursework should provide evidence of competency in the appropriate area.

Administratively, the School of Journalism is divided into Faculties, not Departments as in most other Schools and Colleges at MU. For administrative purposes, all Interest Areas are assigned to one of those Faculties except for two International Interest Areas, which are administered by the School of Journalism's International Programs Office. International programs, however, merely indicate an international interest. The degree is still awarded under the appropriate Emphasis Area.

To ensure maximum flexibility for students, the School also offers an Individually Designed Interest Area. Working with three faculty members, and with the approval of the associate dean for undergraduate studies, a student can design his or her program by selecting from the School's robust offerings of more than 100 courses. Students who pursue this

option must do so within accrediting guidelines and within one of the six approved Emphasis Areas.

Students who desire more information on a particular program should see an Academic Advisor or seek out a member of the supervising Faculty, which is indicated following the description of the Interest Area.

Students interested in one of the international programs should seek out an advisor in the International Programs Office. Interdisciplinary Programs, those that cross traditional media boundaries or depend on skills-based coursework from other MU divisions, are assigned to one of the School's Faculties as indicated.

## Graduate

School of Journalism

179 Gannett Hall

573-882-4852

Master's Programs: [journalism.missouri.edu/programs/masters/](http://journalism.missouri.edu/programs/masters/)

Doctoral Programs: [journalism.missouri.edu/programs/doctoral/](http://journalism.missouri.edu/programs/doctoral/)

**Director of Graduate Studies:** Esther Thorsen

- MA in Journalism (p. 575)
- PhD in Journalism (p. 576)

While most graduate journalism students will find that these graduate programs meet their needs, some may wish to structure an independent model. Such a model takes into account the student's prior education and experience, as well as their unique professional goals. Refer to the MA in Journalism (p. 575) for additional models.

## About Journalism's Graduate Degree Programs

The Missouri School of Journalism awarded the first master's and doctoral degrees in journalism in 1921 and 1934, respectively. The master's and doctoral programs at the School enjoy superb reputations, both among scholars and among practitioners in news, advertising, public relations and strategic communication.

For the master's program, Missouri Journalism offers a complete set of real-media experiences. We operate the only network affiliate (NBC) television station in the country used to train journalism students. We publish a community daily newspaper (not a campus paper), and we operate four major web sites, a local magazine and an international magazine. Students also may train at our campus-based NPR affiliate.

Our strategic communication students design media campaigns for local and national clients. Our students have created advertising and public relations campaigns for Nokia, Apple, Dr Pepper, Anheuser-Busch, Duncan Hines, DuPont, Dow Chemical, Kinko's, Eastman Kodak and many other leading international brands.

We operate educational programs in Washington, D.C., New York, and Brussels where many of our students carry out their capstone projects or do research. We also partner with educational programs around the world.

## Graduate Minor in Law and Conflict Resolution

This program is for journalism doctoral students who are interested in teaching and researching in journalism, law and conflict resolution in a

school of journalism or communication department. For details, refer to the Graduate Minor in Law and Conflict Resolution (p. 578).

## Facilities and Resources

A variety of special facilities and resources are available to help students meet their educational objectives. The Columbia Missourian, a general circulation daily newspaper with full-leased wires of The Associated Press and The New York Times Service, KOMU-TV, an NBC affiliate, KBIA-FM, a National Public Radio station, Mojo Ad Agency and Vox magazine provide students the opportunity for hands-on learning under faculty supervision and to conduct applied research.

The Journalism Library subscribes to more than 125 newspapers and magazines worldwide and catalogs more than 40,000 volumes. Many more resources are available in electronic format.

The State Historical Society of Missouri, on-campus, has an extensive collection of state newspapers dating from 1808.

The Freedom of Information Center maintains a day-to-day study of the actions by government, media and society affecting the movement of information.

The national headquarters of Investigative Reporters and Editors and the National Institute for Computer Assisted Reporting provide educational services to reporters, editors and others interested in investigative journalism.

The Service Journalism program, based in the magazine sequence, focuses on how to effectively provide information to consumers and offers workshops for professionals, covering such topics as health and nutrition, travel, science and minorities coverage.

The Center for Advanced Social Research provides survey and other services to a broad variety of governmental, corporate and media organizations. It employs more than 50 graduate students from around the MU campus.

The Association of Health Care Journalists is headquartered at Missouri and is dedicated to advancing public understanding of health care issues. Its mission is to improve the quality, accuracy and visibility of health care reporting, writing and editing.

The Center on Religion & the Professions works to improve religious literacy among professionals, to help them serve a diverse public. As America grows more religiously diverse, professionals need to better understand the religious traditions and beliefs of the public they serve. CORP's interdisciplinary, practical and applied work centers on that mission. Founded in 2003 with a grant from The Pew Charitable Trusts, the Center is one of Pew's 10 Centers of Excellence. CORP is affiliated with Religion Newswriters Association.

Founded in 2003 with a generous gift from the Donald. W. Reynolds Foundation, the Reynolds Journalism Institute is committed to developing and testing new ways to improve journalism through new technology and improved processes.

## Special Events

Each year the school sponsors the Missouri Honor Medal Award program, which brings contemporary leaders in mass communications to the campus. The school also directs a number of professional development and awards programs, including the international competition for the best Pictures of the Year.

## Honor Society

Kappa Tau Alpha, national honor society for scholarship in journalism, founded at the university in 1910, has its headquarters in the school.

## Funding

An array of competitively awarded fellowships, assistantships, scholarships and other financial aid opportunities are available. All applicants for admission are considered for any available funding. No separate application form is needed.

## Undergraduate

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### Department Level Requirements - Journalism

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#### Degree with Honors Requirements

Graduation with honors is based on the grade point average during the final 60 graded credits in residence. *Cum laude* requires 3.5, *magna cum laude* 3.7, and *summa cum laude* 3.9. The student must have a minimum of 60 credits in residence at MU to be considered for graduation with honors. The School computes the grades to three decimal points and does not round up. A student must request consideration for graduation with honors when applying for graduation.

Kappa Tau Alpha is a journalism honorary society that accepts the top 10 percent of each graduating class. Qualifying students are sent a letter with details about the society and are recognized at the journalism graduation ceremony.

#### Individually Designed Interest Area

Students who find that none of the existing Interest Areas meet their needs may work with the faculty to construct a tailored Interest Area to meet their educational objectives. To do this, students work with a faculty mentor and at least two other faculty members to design a course plan using existing courses in the School of Journalism, relevant courses outside the School and no more than six credits of Problems, Topics or Communications Practice courses. The student will enroll and be granted a degree in the emphasis area that aligns with their faculty mentor. Because of large enrollment, students are not able to tailor an Interest Area in Strategic Communication. Students wishing to pursue an individually designed Interest Area should start by seeing a journalism advisor in 76 Gannett Hall.

<b>Electives to Achieve the Interest Area's Goal</b>	<b>16</b>
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The student must complete 16 hours of elective journalism courses mutually agreed to in advance by the student and the three supervising faculty members. These courses must form a coherent plan that leads to competency in the targeted area of expertise and must fit within one of the approved Emphasis Areas of the School.

<b>Journalism or Non-Journalism Electives (6 Non-Journalism Credits)</b>	<b>6</b>
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In consultation with the faculty mentor, the student should choose a minimum of six non-journalism credits that complement the program's objectives. For example, if a student were to design a program in some aspect of entrepreneurial journalism, six or more credits in business courses might be desirable. In the absence of relevant courses for the targeted interest area, these credits become general electives for students.

### Capstone 3

Students pursuing this interest area should choose from among the School's available capstone courses to find one that best meets the model's objectives. In the absence of a clear choice, JOURN 4990: Journalism and Democracy, is recommended. Students also are required to complete an upper-division Writing Intensive (WI) course. Some capstones carry WI designation. Others may be found in the journalism curriculum or outside the school.

### Approval Procedure

Students who wish to construct a special interest area may pick up a form for that purpose in Students Services, 76 Gannett. After meeting with the three faculty members chosen to oversee progression through the program, the student will submit the form - complete with the signatures of the student and the three supervising faculty members - to the Associate Dean for Undergraduate Studies. The student must win approval of the tailored program from the associate dean before beginning the program. Thus, a student must file a proposal for approval by the time he or she has completed no more than 70 total credits. Once approved, the proposal goes to the student's academic advisor, who places it in the student's file and uses it to help the student navigate the remainder of the curriculum.

### Total Credits for the Degree and their Breakdown

Students pursuing a tailored program must complete 123 credit to include:

- The same 60 credits that all students must complete before entering upper-division status.
- Not more than 44 journalism credits.
- A total of at least 79 non-journalism credits.

## BJ in Journalism

### Major Program Requirements

Effective Fall Semester 2013, the Bachelor of Journalism degree requires 44 journalism credits and 79 non-journalism credits.

To obtain the Bachelor of Journalism degree, a student must:

- Be regularly admitted to an interest area within the school
- Complete at least 31 upper-division credits of acceptable journalism course work
- Complete at least 31 credits of acceptable course work outside the school
- Earn a cumulative GPA of at least 2.0 for all work taken while in the School of Journalism and a GPA of at least 2.0 for all journalism courses
- Complete all University graduation requirements (p. 17), including University General Education (p. 18) requirements

### Major Core Requirements

JOURN 4000	Communications Law	3
JOURN 4568	History of Photojournalism	3
or JOURN 3000	History of American Journalism	

### Electives outside Journalism 31

Must be numbered 3000 or above or Honors courses numbered 2000H or above

### Behavioral, biological, physical and mathematical science 3

Select from anthropology, biology, computer science, chemistry, geology, psychology, physics, sociology, statistics or mathematics.

### Social Science 6

Select from: economics, history, political science or geography.

### Humanities 9

Select from: history or appreciation of art or music, non-US civilization or classics, humanities, literature, philosophy, appreciation of communication and theatre or religious studies.

### Non-journalism electives 13

Must be numbered 3000 or above or 2000H or above.

### General Electives

Electives necessary to complete a minimum of 79 credits of non-journalism classes. Any course acceptable to the School and advisor is allowed.

### Special Offerings

#### International Journalism (Interdisciplinary)

The next generation of journalism students must be equipped to work in a global environment. This Interest Area is designed to capitalize on Missouri's international reputation and its international resources by placing under one umbrella the school's existing Study Abroad opportunities, its internationally focused media and multimedia projects with global partners. Students in this Interest Area may take courses within any of the existing or prospective areas to complement their international interests. *This degree is granted in the student's emphasis area of choice (Convergence Journalism, Magazine Journalism, Photojournalism, Print and Digital News or Radio-TV Journalism) but is administered by the School's International Programs Office.*

### Required Journalism Classes 15

Take one of these:		
JOURN 4258	Global Communication	3
JOURN 4650	International Issues Reporting	3
JOURN 4656	International News Media Systems	3
JOURN 4658	International Journalism	3
Take one of these:		
JOURN 4308	Broadcast News III	3
JOURN 4450	News Reporting	3
JOURN 4556	Fundamentals of Photojournalism	3
JOURN 4804	Convergence Reporting	3
Take one of these capstones:		
JOURN 4980	The Picture Story and Photographic Essay	3
JOURN 4990	Journalism and Democracy	3
JOURN 4992	Reporting, Editing and Marketing of Converged Media	3

If Radio-TV track take one of these capstones:

JOURN 4974	Advanced Internet Applications for Radio/TV News	3
JOURN 4976	Seminar in Radio/TV News	3
JOURN 4978	Media Management and Leadership	3
Journalism Study Abroad		6

(It is recommended that the student study abroad in the second semester of their junior year or the first semester of their senior year.)

#### Suggested Journalism Electives

JOURN 4050	Communications Practice	
JOURN 4258	Global Communication	
JOURN 4300	Broadcast News I	
JOURN 4306	Broadcast News II	
JOURN 4450	News Reporting	
JOURN 4556	Fundamentals of Photojournalism	
JOURN 4650	International Issues Reporting	
JOURN 4656	International News Media Systems	
JOURN 4658	International Journalism	
JOURN 4660	Media Forces Shaping the European Union	
JOURN 4662	Global News Across Platforms	
JOURN 4730	Journalism and Conflict	
JOURN 4804	Convergence Reporting	

#### Suggested Non-Journalism Electives

AG_EC 3150	International Agribusiness	
AG_EC 3271	International Agricultural Development	
AG_EC 3272	International Food Trade and Policy	
ANTHRO 3700	Cultures of Europe	
ANTHRO 3780	Cultures of Southeast Asia	
ANTHRO 4400	Language and Culture	
ANTHRO 4790	Culture and Society in South Asia	
ATM_SC 3600	Climates of the World	
BL_STU 4230	Women, Development, and Globalization	
or SOCIOL 4230	Women, Development, and Globalization	
CHINSE 3300	Chinese Traditions and Global Integration	
FINANC 4720	International Finance	
GEOG 1100	Regions and Nations of the World I	
HIST 3820	Twentieth Century China	
HIST 3850	Islam and the West	
HIST 3870	Social Revolution in Latin America	
HIST 4870	Southeast Asia Since the Eighteenth Century	
KOREAN 4220	Korean Unification	
MRKTNG 3975	Current Issues in International Marketing	
MRKTNG 4720	Global Marketing	
POL_SC 1400	International Relations	
POL_SC 4400	Theories of International Relations	

POL_SC 4420	Politics of International Economic Relations	
POL_SC 4440	International Organization	
POL_SC 4500	The European Union in the Global System	
POL_SC 4540	American Foreign Policies	
POL_SC 4600	Latin American Politics	
POL_SC 4610	European Political Systems	
RU_SOC 2010	Leadership in Today's World	
RU_SOC 3235	Global Perspectives and Realities	
S_A_ST 3245	Nonviolence in the Modern World	
S_A_ST 4850	Traversing the Muslim World	
SOCIOL 3210	Sociology of Globalization	
SOCIOL 3255	Youth in Today's World	
SOCIOL 4230	Women, Development, and Globalization	
T_A_M 2400	Global Consumers	
T_A_M 3110	Textiles and Apparel in the Global Economy	
T_A_M 4110	Global Sourcing	
T_A_M 4310	Global Retailing	

## Semester Plan

A sample plan of study has not been designed for this major. Students should contact the academic department for assistance with academic planning.

## BJ in Journalism with Emphasis in Convergence Journalism

### Major Program Requirements

All Convergence Interest Areas teach multimedia storytelling by having students take the three core convergence classes, JOURN 4804 Convergence Reporting, JOURN 4806 Convergence Editing and Producing; and the capstone, JOURN 4992 Reporting, Editing and Marketing of Converged Media. Students then choose to specialize by taking classes from selected requirements and electives.

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

### Emerging Media (Interdisciplinary)

The journalism industry is constantly changing as it discovers new ways of covering the news and new technologies to deliver it. This Interest Area is for the student who wants to learn and work with some of the latest developments in journalism, such as delivery of news via mobile devices and tablets. Classes in this area provide a wide range of opportunities from content creation, and Web and application development to classes working with content created by other journalists. This program of study is primarily for students interested in online, social and mobile delivery of news and information and organizations. *Administered by the Convergence Faculty.*

Required Journalism Classes		15
JOURN 4804	Convergence Reporting	3
JOURN 4806	Convergence Editing and Producing	3

JOURN 4992 Reporting, Editing and Marketing of Converged Media 3

Select two of the following:

JOURN 4502 Multimedia Planning and Design 3

JOURN 4700 Participatory Journalism 3

JOURN 4810 Advanced Global Converged News 3

JOURN 4812 Online Audience Development 3

#### Suggested Journalism Electives

Select 10 credits from the following: 10

JOURN 4430 Computer-Assisted Reporting

JOURN 4436 Investigative Reporting

JOURN 4438 Business and Economics Reporting

JOURN 4508 Information Graphics

JOURN 4662 Global News Across Platforms

JOURN 4700 Participatory Journalism

JOURN 4720 Internet Law

JOURN 4810 Advanced Global Converged News

JOURN 4812 Online Audience Development

JOURN 4940 Internship in Journalism

JOURN 4974 Advanced Internet Applications for Radio/TV News

JOURN 4978 Media Management and Leadership

#### Suggested Non-Journalism Electives

INFOTC 4500 Team-Based Mobile Device Application Development

IS\_LT 4360 Introduction to Web Development

### Entrepreneurial Journalism (Interdisciplinary)

More and more of today's journalism students will go to work in non-traditional news organizations, start their own businesses or freelance. Students in this Interest Area will learn about current markets in journalism and what audiences want. They also will study the relative marketability of content. Students will learn the market value of their own work, how to build their own brands and how to market. *Administered by the Convergence Faculty.*

**Required Journalism Classes** 12

JOURN 4804 Convergence Reporting 3

JOURN 4806 Convergence Editing and Producing 3

Select one of the following: 3

JOURN 4734 Journalism and Chaos: How to Understand and Cover 21st Century Business Models

JOURN 4812 Online Audience Development

Capstone:

JOURN 4992 Reporting, Editing and Marketing of Converged Media

#### Required Non-Journalism Electives

INFOTC 4500 Team-Based Mobile Device Application Development 3

#### Suggested Journalism Electives

Select 10 credits from the following: 10

JOURN 4150 Using Infographics

JOURN 4406 News Editing

JOURN 4410 Intermediate Writing

JOURN 4416 Science, Health and Environmental Writing

JOURN 4148 Interviewing Essentials

JOURN 4436 Investigative Reporting

JOURN 4438 Business and Economics Reporting

JOURN 4440 Mapping for Stories and Graphics

JOURN 4462 Emerging Technologies in Journalism

JOURN 4500 News Design

JOURN 4502 Multimedia Planning and Design

JOURN 4506 Magazine Design

JOURN 4508 Information Graphics

JOURN 4510 Visual Communication

JOURN 4550 Basic Photography and Photo Editing

JOURN 4562 Photojournalism Business Practices

JOURN 4700 Participatory Journalism

JOURN 4718 Law and the Courts

JOURN 4728 Confronting Controls on Information

JOURN 4738 General Semantics in Journalism

JOURN 4940 Internship in Journalism

JOURN 4950 Understanding Audiences

JOURN 4986 Advanced Writing

#### Suggested Non-Journalism electives

ACCTCY 2010 Introduction to Accounting

ACCTCY 2036 Accounting I

MRKTNG 3000 Principles of Marketing

MRKTNG 4050 Marketing Research \*

MRKTNG 4420 Sales Management \*

MRKTNG 4650 e-Marketing \*

\* Required prerequisite for these courses is MRKTNG 3000.

### Multimedia Producing (Interdisciplinary)

The focus of this Interest Area is planning and producing content across medium platforms. A student in this area will have the knowledge and skills to work in traditional newsrooms, Web-only newsrooms, non-traditional news organizations and other growing media areas. A student choosing this path is one who is less interested in a traditional reporting track and is more interested in working with content created by others. *Administered by the Convergence Faculty.*

#### Required Journalism Classes

JOURN 4502 Multimedia Planning and Design 3

JOURN 4804 Convergence Reporting 3

JOURN 4806 Convergence Editing and Producing 3

JOURN 4992 Reporting, Editing and Marketing of Converged Media (capstone) 3

Select one of the following: 3

JOURN 4554 Visual Editing for Multimedia 3

JOURN 4670 Newspaper Photo Desk Management 3

#### Suggested Journalism Electives

Select 10 credits from the following: 10

JOURN 4430	Computer-Assisted Reporting
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4508	Information Graphics
JOURN 4662	Global News Across Platforms
JOURN 4700	Participatory Journalism
JOURN 4720	Internet Law
JOURN 4810	Advanced Global Converged News
JOURN 4812	Online Audience Development
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4978	Media Management and Leadership

**Suggested Non-Journalism Electives**

INFOTC 4500	Team-Based Mobile Device Application Development
IS_LT 4360	Introduction to Web Development
IS_LT 4364	Flash Authoring

**Convergence Photojournalism (Interdisciplinary)**

This course of study is for those interested in communicating largely through photography and other visual mediums. Skills acquired include documentary photography, lighting and studio techniques, and photo editing with both still and moving images. Students build an appreciation for and understanding of visual communication and can expand into illustrative graphics, video and multimedia management. Students are prepared for careers as photojournalists for print and online publications and as freelancers. *Administered by the Convergence Faculty.*

**Required Journalism Classes**

JOURN 4556	Fundamentals of Photojournalism	3
JOURN 4804	Convergence Reporting	3
JOURN 4806	Convergence Editing and Producing	3
JOURN 4992	Reporting, Editing and Marketing of Converged Media (capstone)	3

Select one of the following: 3

JOURN 4558	Advanced Techniques in Photojournalism
JOURN 4566	Electronic Photojournalism

**Suggested Journalism Electives**

Select 10 credits from the following: 10

JOURN 4502	Multimedia Planning and Design
JOURN 4430	Computer-Assisted Reporting
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication
JOURN 4554	Visual Editing for Multimedia
JOURN 4558	Advanced Techniques in Photojournalism
JOURN 4560	Staff Photojournalism
JOURN 4566	Electronic Photojournalism
JOURN 4568	History of Photojournalism
JOURN 4662	Global News Across Platforms

JOURN 4670	Newspaper Photo Desk Management
JOURN 4700	Participatory Journalism
JOURN 4720	Internet Law
JOURN 4810	Advanced Global Converged News
JOURN 4812	Online Audience Development
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4978	Media Management and Leadership

**Suggested Non-Journalism Electives**

ART_PHOT 3600	Intermediate Photography
ART_PHOT 4600	Advanced Photography
FILM_S 3005	Topics in Film Studies - Humanities
INFOTC 4500	Team-Based Mobile Device Application Development
IS_LT 4360	Introduction to Web Development
IS_LT 4364	Flash Authoring

**Convergence Radio Reporting and Producing (Interdisciplinary)**

This interest area is for the student wanting to work largely in audio reporting. This area includes a wide range of reporting classes and producing/management classes, giving the student a sense of radio work both as a reporter and as a behind-the-scenes producer. Several courses offered provide the opportunity for training in media management. *Administered by the Convergence Faculty.*

**Required Journalism Classes**

JOURN 4050	Communications Practice	3
JOURN 4310	News Producing (Radio Section)	3
JOURN 4804	Convergence Reporting	3
JOURN 4806	Convergence Editing and Producing	3
JOURN 4992	Reporting, Editing and Marketing of Converged Media (capstone)	3

**Suggested Journalism Electives**

Select 10 hours from the following: 10

JOURN 4330	From Murrow to Moore: What Good Journalists Read
JOURN 4428	Health Reporting Skills
JOURN 4430	Computer-Assisted Reporting
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4502	Multimedia Planning and Design
JOURN 4508	Information Graphics
JOURN 4554	Visual Editing for Multimedia
JOURN 4650	International Issues Reporting
JOURN 4662	Global News Across Platforms
JOURN 4700	Participatory Journalism
JOURN 4720	Internet Law
JOURN 4810	Advanced Global Converged News
JOURN 4812	Online Audience Development

JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4978	Media Management and Leadership

## Convergence Television Reporting (Interdisciplinary)

This Interest Area is for the student wanting to work largely in television reporting. This area includes a wide range of reporting classes and producing/management classes, giving the student a sense of television reporting in front of the camera. Other courses in multimedia prepare the student well for Web-based journalism as it complements television. *Administered by the Convergence Faculty.*

### Required Journalism Classes

JOURN 4050	Communications Practice	1
JOURN 4306	Broadcast News II	3
JOURN 4308	Broadcast News III	3
JOURN 4804	Convergence Reporting	3
JOURN 4806	Convergence Editing and Producing	3
JOURN 4992	Reporting, Editing and Marketing of Converged Media (capstone)	3

### Suggested Journalism Electives

Select 9 credits from the following:	9
JOURN 4310	News Producing
JOURN 4320	Advanced Broadcast Reporting
JOURN 4330	From Murrow to Moore: What Good Journalists Read
JOURN 4428	Health Reporting Skills
JOURN 4430	Computer-Assisted Reporting
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4502	Multimedia Planning and Design
JOURN 4508	Information Graphics
JOURN 4554	Visual Editing for Multimedia
JOURN 4650	International Issues Reporting
JOURN 4662	Global News Across Platforms
JOURN 4700	Participatory Journalism
JOURN 4720	Internet Law
JOURN 4810	Advanced Global Converged News
JOURN 4812	Online Audience Development
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4978	Media Management and Leadership

## Semester Plan

See your advisor to set up a semester plan.

## BJ in Journalism with Emphasis in Magazine Journalism

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

### Arts and Culture Journalism (Interdisciplinary)

This interdisciplinary Interest Area gives students the opportunity to expand their understanding of the arts as they develop critical thinking skills about society, culture and the media. Students are encouraged to see culture as a central part of the journalistic enterprise as they learn about art, music, theatre, popular culture and critical reviewing. This is intended to lay the groundwork for careers not only in traditional and emerging forms of journalism but also as communicators in cultural institutions, museums, nonprofit agencies, government programs and community arts organizations. *Administered by the Magazine Faculty.*

### Required Journalism Classes

JOURN 4410	Intermediate Writing	3
JOURN 4418	Critical Reviewing	3
Select one of the following:		3
JOURN 4450	News Reporting	
JOURN 4804	Convergence Reporting	
Select one of the following:		3
JOURN 4400	Introduction to News Editing	
JOURN 4408	Magazine Editing	
Select one of the following Capstone courses:		3
JOURN 4984	Magazine Staff	
JOURN 4986	Advanced Writing	
JOURN 4990	Journalism and Democracy	
JOURN 4994	Magazine Publishing	

### Suggested Journalism Electives

Select 10 credits from the following:	10
JOURN 4150	Using Infographics
JOURN 4400	Introduction to News Editing
JOURN 4408	Magazine Editing
JOURN 4428	Health Reporting Skills
JOURN 4430	Computer-Assisted Reporting
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4450	News Reporting
JOURN 4460	Advanced News Reporting
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication
JOURN 4550	Basic Photography and Photo Editing
JOURN 4662	Global News Across Platforms
JOURN 4700	Participatory Journalism
JOURN 4804	Convergence Reporting
JOURN 4812	Online Audience Development
JOURN 4940	Internship in Journalism



JOURN 4950 Understanding Audiences

JOURN 4986 Advanced Writing

**Suggested Non-Journalism Electives**

Arts-In-Depth Classes:

ART\_GNRL 2030 & 2030H Context and Culture and Context and Culture - Honors

MUSIC\_NM 2306 & M2306H Perceiving Musical Traditions and Styles and Perceiving Musical Traditions and Styles - Honors

THEATR 3770 The Theatre Experience: From Page to Stage and Screen

**Also Recommended**

Minor in Art, Music, Theatre or Film Studies

**Magazine Design**

This Interest Area focuses on visual storytelling in the magazine industry. Critical thinking skills and application methods are studied and practiced in courses that cover design skills, management issues and theoretical frameworks. This Interest Area prepares students to be designers/art directors at print and online publications. *Administered by the Magazine Faculty.*

**Required Journalism Classes**

JOURN 4408	Magazine Editing	3
JOURN 4410	Intermediate Writing	3
JOURN 4450	News Reporting	3
JOURN 4506	Magazine Design	3
JOURN 4988	Advanced Magazine Design	3

**Suggested Journalism Electives**

Select 10 credits from the following: 10

JOURN 4500	News Design
JOURN 4502	Multimedia Planning and Design
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication
JOURN 4550	Basic Photography and Photo Editing
JOURN 4554	Visual Editing for Multimedia
JOURN 4566	Electronic Photojournalism
JOURN 4568	History of Photojournalism
JOURN 4662	Global News Across Platforms
JOURN 4670	Newspaper Photo Desk Management
JOURN 4700	Participatory Journalism
JOURN 4716	Women and the Media
JOURN 4730	Journalism and Conflict
JOURN 4806	Convergence Editing and Producing
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences

**Suggested Non-Journalism Electives**

AR_H_A 3850	American Art and Culture, 1913-Present
ART_GRDN 2410	Graphic Design I
ART_PHOT 2600	Beginning Photography
IS_LT 4360	Introduction to Web Development

IS\_LT 4364 Flash Authoring

IS\_LT 4370 Intermediate Web Development

Arts-In-Depth Classes:

ART\_GNRL 2030 & 2030H Context and Culture and Context and Culture - Honors

MUSIC\_NM 2306 & M2306H Perceiving Musical Traditions and Styles and Perceiving Musical Traditions and Styles - Honors

THEATR 3770 The Theatre Experience: From Page to Stage and Screen

**Magazine Editing**

Students in this Interest Area focus on the finer aspects of microediting: grammar, style, syntax and usage. They also gain hands-on experience in macroediting: pitching and assigning stories, writing display type, coordinating photography and art, working with designers, fact checking, proofreading and following a publication through all stages of print or online production. Classes provide an analysis of the industry and study of innovative techniques and delivery platforms. Recommended for those who seek careers as editors in the magazine and book-publishing industries. *Administered by the Magazine Faculty.*

**Required Journalism Classes**

JOURN 4408	Magazine Editing	3
JOURN 4410	Intermediate Writing	3
JOURN 4450	News Reporting	3
JOURN 4506	Magazine Design	3
JOURN 4984	Magazine Staff (capstone)	3

**Suggested Journalism Electives**

Select 10 credits from the following: 10

JOURN 4150	Using Infographics
JOURN 4400	Introduction to News Editing
JOURN 4416	Science, Health and Environmental Writing
JOURN 4510	Visual Communication
JOURN 4554	Visual Editing for Multimedia
JOURN 4662	Global News Across Platforms
JOURN 4700	Participatory Journalism
JOURN 4716	Women and the Media
JOURN 4718	Law and the Courts
JOURN 4730	Journalism and Conflict
JOURN 4806	Convergence Editing and Producing
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4986	Advanced Writing

**Suggested Non-Journalism Electives**

SOCIOL 2310 Culture and Mass Media

Arts-In-Depth Classes:

ART\_GNRL 2030 & 2030H Context and Culture and Context and Culture - Honors

MUSIC\_NM 2306 & M2306H Perceiving Musical Traditions and Styles and Perceiving Musical Traditions and Styles - Honors

THEATR 3770 The Theatre Experience: From Page to Stage and Screen

## Magazine Publishing and Management

This Interest Area is directed to students who hope to become leaders in the field. Course requirements and electives are designed to give an overview of all aspects of magazine publishing, both print and online. Theoretical courses in law, business and management as applied to publications complement skills classes in reporting, writing, editing and design. *Administered by the Magazine Faculty.*

### Required Journalism Classes

JOURN 4408	Magazine Editing	3
JOURN 4410	Intermediate Writing	3
JOURN 4450	News Reporting	3
JOURN 4506	Magazine Design	3
JOURN 4994	Magazine Publishing (capstone)	3

### Suggested Journalism Electives

Select 10 credits from the following: 10

JOURN 4502	Multimedia Planning and Design	
JOURN 4510	Visual Communication	
JOURN 4662	Global News Across Platforms	
JOURN 4700	Participatory Journalism	
JOURN 4710	Newspaper Management	
JOURN 4716	Women and the Media	
JOURN 4720	Internet Law	
JOURN 4730	Journalism and Conflict	
JOURN 4806	Convergence Editing and Producing	
JOURN 4940	Internship in Journalism	
JOURN 4950	Understanding Audiences	

### Suggested Non-Journalism Electives

COMMUN 1200	Public Speaking	
MANGMT 3000	Principles of Management	
MRKTNG 3000	Principles of Marketing	
SOCIOL 2310	Culture and Mass Media	

## Magazine Writing

This Interest Area uses an "intra-disciplinary" approach grounded in magazine traditions, theories and practices. Students learn the power of revision and learn to tell stories with frankness and intimacy. They learn to use narrative storytelling tools: character, key moments, dialogue, telling details and place. The students learn to track the notion of the journalist as a savvy, articulate, thoughtful and emphatic witness of events. *Administered by the Magazine Faculty.*

### Required Journalism Classes

JOURN 4408	Magazine Editing	3
JOURN 4410	Intermediate Writing	3
JOURN 4450	News Reporting	3
JOURN 4506	Magazine Design	3
JOURN 4986	Advanced Writing (capstone)	3

### Suggested Journalism Electives

Select 10 credits from the following: 10

SCI_AG_J 4480	Will Write for Food (and Wine)	
JOURN 4148	Interviewing Essentials	
JOURN 4400	Introduction to News Editing	
JOURN 4412	Lifestyle Journalism	
JOURN 4416	Science, Health and Environmental Writing	
JOURN 4418	Critical Reviewing	
JOURN 4420	Editorial Writing	
JOURN 4426	Religion Reporting and Writing	
JOURN 4428	Health Reporting Skills	
JOURN 4430	Computer-Assisted Reporting	
JOURN 4436	Investigative Reporting	
JOURN 4438	Business and Economics Reporting	
JOURN 4460	Advanced News Reporting	
JOURN 4650	International Issues Reporting	
JOURN 4662	Global News Across Platforms	
JOURN 4700	Participatory Journalism	
JOURN 4716	Women and the Media	
JOURN 4806	Convergence Editing and Producing	
JOURN 4940	Internship in Journalism	
JOURN 4950	Understanding Audiences	

### Suggested Non-Journalism Electives

ENGLSH 2010	Intermediate Composition	
ENGLSH 2520	Creative Writing: Intermediate Nonfiction Prose	
ENGLSH 4520	Creative Writing: Advanced Nonfiction Prose	
Arts-In-Depth Classes:		
ART_GNRL 2030 & 2030H	Context and Culture and Context and Culture - Honors	
MUSIC_NM 2306 & M2306H	Perceiving Musical Traditions and Styles and Perceiving Musical Traditions and Styles - Honors	
THEATR 3770	The Theatre Experience: From Page to Stage and Screen	

## Semester Plan

See your advisor to set up semester plan.

## BJ in Journalism with Emphasis in Photojournalism

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

### Photojournalism Interest Areas

#### Photojournalism

This Interest Area educates students in the history, theory and skills of photojournalism, including still and moving images, as well as audio. Also covered are the principles and practice of visual editing and design

for print and online. Photojournalism students learn to create truly integrated multimedia projects, incorporating audio, video and stills into compelling visual story-telling projects. The program's essential element remains understanding the power of image, and it embraces all the new technologies in presentation. Students are prepared for careers as photojournalists for print and online publications and as freelancers. *Administered by the Photojournalism Faculty.*

**Required Journalism Classes**

JOURN 4556	Fundamentals of Photojournalism	3
JOURN 4558	Advanced Techniques in Photojournalism	3
JOURN 4560	Staff Photojournalism	3
JOURN 4980	The Picture Story and Photographic Essay (capstone)	3

Select one of the following: 3

JOURN 4450	News Reporting
JOURN 4804	Convergence Reporting

**Suggested Journalism Electives**

Select 10 credits from the following: 10

JOURN 4300	Broadcast News I
JOURN 4502	Multimedia Planning and Design
JOURN 4500	News Design
JOURN 4506	Magazine Design
JOURN 4510	Visual Communication
JOURN 4554	Visual Editing for Multimedia
JOURN 4562	Photojournalism Business Practices
JOURN 4566	Electronic Photojournalism
JOURN 4568	History of Photojournalism
JOURN 4670	Newspaper Photo Desk Management
JOURN 4940	Internship in Journalism

**Suggested Non-Journalism Electives**

ART_PHOT 3600	Intermediate Photography
ART_PHOT 4600	Advanced Photography
FILM_S 2520	Introduction to Film Production
IS_LT 4360	Introduction to Web Development

**Visual Editing and Management**

This Interest Area educates students in the skills and theory of picture editing and visual presentation in print and online publications. This will prepare students for careers in visual editing at newspapers, magazines and with online publications. Administered by the Photojournalism Faculty.

**Required Journalism Classes**

JOURN 4502	Multimedia Planning and Design	3
JOURN 4556	Fundamentals of Photojournalism	3
JOURN 4566	Electronic Photojournalism	3
JOURN 4670	Newspaper Photo Desk Management (capstone)	3

Take one of these:

JOURN 4450	News Reporting	3
JOURN 4804	Convergence Reporting	3

**Suggested Journalism Electives**

Select 10 credits from the following: 10

JOURN 4464	Magazines Across Platforms
JOURN 4500	News Design
JOURN 4506	Magazine Design
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication
JOURN 4554	Visual Editing for Multimedia
JOURN 4558	Advanced Techniques in Photojournalism
JOURN 4560	Staff Photojournalism
JOURN 4562	Photojournalism Business Practices
JOURN 4564	Micro-Documentary Photojournalism and Videography
JOURN 4568	History of Photojournalism
JOURN 4710	Newspaper Management
JOURN 4940	Internship in Journalism
JOURN 4980	The Picture Story and Photographic Essay

**Suggested Non-Journalism Electives**

FILM_S 2520	Introduction to Film Production
IS_LT 4360	Introduction to Web Development
IS_LT 4364	Flash Authoring

**BJ in Journalism with Emphasis in Print and Digital News**

**Major Program Requirements**

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

**Print and Digital News Interest Areas**

**Business and Economics Journalism (Interdisciplinary)**

This Interest Area is for journalism students interested in learning the skills of reporting business and economics news across platforms. It allows students to add a focus on economic, business and consumer reporting and emphasizes the use of financial data analysis in reporting. Similarly, it encourages students to take basic courses in other subject areas that will give them important skills, such as basic accounting, or advanced economics and finance. Students will gain the skills to work covering Wall Street, government economics, consumer and personal finance issues, and local business. A minor in Economics or Business is suggested. *Administered by the Print and Digital News Faculty.*

**Required Journalism Classes \***

Select one of the following: 3

JOURN 4450	News Reporting
JOURN 4804	Convergence Reporting
JOURN 4300	Broadcast News I

Select one of the following: 3

JOURN 4460	Advanced News Reporting
JOURN 4806	Convergence Editing and Producing
JOURN 4306	Broadcast News II

Select one of the following: 3

JOURN 4410	Intermediate Writing
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JOURN 4308	Broadcast News III	
<b>Required</b>		
JOURN 4438	Business and Economics Reporting **	3
Select one of the following:		3
JOURN 4992	Reporting, Editing and Marketing of Converged Media	
JOURN 4990	Journalism and Democracy	
JOURN 4974	Advanced Internet Applications for Radio/TV News	
JOURN 4976	Seminar in Radio/TV News	
JOURN 4978	Media Management and Leadership	
<b>Suggested Journalism Electives</b>		
Select 10 credits from the following:		10
JOURN 4148	Interviewing Essentials	
JOURN 4150	Using Infographics	
JOURN 4300	Broadcast News I	
JOURN 4734	Journalism and Chaos: How to Understand and Cover 21st Century Business Models	
JOURN 4414	Field Reporting on the Food System and Environment	
JOURN 4416	Science, Health and Environmental Writing	
JOURN 4410	Intermediate Writing	
JOURN 4436	Investigative Reporting	
JOURN 4508	Information Graphics	
JOURN 4510	Visual Communication	
JOURN 4550	Basic Photography and Photo Editing	
JOURN 4700	Participatory Journalism	
JOURN 4718	Law and the Courts	
JOURN 4728	Confronting Controls on Information	
JOURN 4736	Changing Media Business Models	
JOURN 4940	Internship in Journalism	
JOURN 4950	Understanding Audiences	
JOURN 4986	Advanced Writing	
JOURN 4058	New York Program: Journalism Theory and Practice	
Independent Study in Personal Finance		
<b>Suggested Non-Journalism Electives</b>		
ACCTCY 2010	Introduction to Accounting	
ACCTCY 2026	Accounting I	
ECONOM 3229	Money, Banking and Financial Markets	
ECONOM 4315	Public Economics	
FINANC 2000	Survey of Business Finance	
FINANC 3000	Corporate Finance	
MANGMT 3000	Principles of Management	
MRKTNG 3000	Principles of Marketing	
NAT_R 4325	Introduction to Geographic Information Systems	
GEOG 3040	Introduction to Geographic Information Systems GIS	
POL_SC 2100	State Government	

POL_SC 2200	The Judicial Process	
POL_SC 4000	Introductory Statistics for Political Science	
POL_SC 4100	Political Parties and Election Campaigns	
POL_SC 4320	Public Policy	

\* If you are not planning to pursue a R/TV focus in this interest area (i.e. Taking Broadcast I, II & III) you can enroll in JOURN 4300 only on a space available basis.

\*\* Note: Students who want to do business reporting with KOMU must be in or have taken JOURN 4308 Broadcast News III

## Multiplatform Design (Interdisciplinary)

This Interest Area teaches students to tell stories visually across online and print platforms. Students learn to make decisions about the framing and packaging of information, and the effects of those decisions on user perceptions. They learn to design in a way that lets the users take control of their information consumption and to use multimedia tools to enhance a story or persuasive message, not distract from it. *Administered by the Print and Digital News Faculty.*

### Required Journalism Classes

JOURN 4502	Multimedia Planning and Design	3
Select one of the following:		3

JOURN 4450	News Reporting	
JOURN 4804	Convergence Reporting	
Select one of the following:		3

JOURN 4400	Introduction to News Editing	
JOURN 4408	Magazine Editing	
Select one of the following:		3

JOURN 4500	News Design	
JOURN 4506	Magazine Design	
JOURN 4508	Information Graphics	

Select one of the following:		3
JOURN 4990	Journalism and Democracy	
JOURN 4992	Reporting, Editing and Marketing of Converged Media	

Suggested Journalism Electives		10
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### Highly Suggested:

JOURN 4226	Strategic Design and Visuals I	
JOURN 4500	News Design	
JOURN 4502	Multimedia Planning and Design	
JOURN 4506	Magazine Design	
JOURN 4508	Information Graphics	
JOURN 4554	Visual Editing for Multimedia	
JOURN 4566	Electronic Photojournalism	
JOURN 4974	Advanced Internet Applications for Radio/TV News	

### Also Suggested:

JOURN 4050	Communications Practice (see advisor for correct sections)	
or JOURN 4350	Problems in Journalism	
JOURN 4430	Computer-Assisted Reporting	
JOURN 4440	Mapping for Stories and Graphics	
JOURN 4510	Visual Communication	

JOURN 4550 Basic Photography and Photo Editing

JOURN 4554 Visual Editing for Multimedia

JOURN 4940 Internship in Journalism

JOURN 4950 Understanding Audiences

**Suggested Non-Journalism Electives**

AR\_H\_A 3850 American Art and Culture, 1913-Present

ART\_GRDN 2410 Graphic Design I

ART\_PHOT 2600 Beginning Photography

INFOTC 3640 Digital Effects

INFOTC 4500 Team-Based Mobile Device Application Development

IS\_LT 4364 Flash Authoring

IS\_LT 4370 Intermediate Web Development

Arts-In-Depth Classes:

ART\_GNRL 2030 and Context and Culture - Honors & 2030H

MUSIC\_NM 2306 and Perceiving Musical Traditions and Styles - Honors & M2306H

THEATR 3770 The Theatre Experience: From Page to Stage and Screen

JOURN 4420 Editorial Writing

JOURN 4426 Religion Reporting and Writing

JOURN 4428 Health Reporting Skills

JOURN 4430 Computer-Assisted Reporting

JOURN 4436 Investigative Reporting

JOURN 4438 Business and Economics Reporting

JOURN 4450 News Reporting

JOURN 4460 Advanced News Reporting

JOURN 4508 Information Graphics

JOURN 4510 Visual Communication

JOURN 4650 International Issues Reporting

JOURN 4700 Participatory Journalism

JOURN 4706 The Community Newspaper

JOURN 4710 Newspaper Management

JOURN 4720 Internet Law

JOURN 4804 Convergence Reporting

JOURN 4806 Convergence Editing and Producing

JOURN 4940 Internship in Journalism

JOURN 4950 Understanding Audiences

JOURN 4986 Advanced Writing

## News Reporting (Interdisciplinary)

This Interest Area provides the opportunity for reporting and writing across a variety of styles and platforms, including breaking news, enterprise and features. Stories are reported and produced using words, video, audio, graphics and more. The program of study prepares students for jobs in online media, and print publications such as newspapers, magazines and nonprofit organizations. *Administered by the Print and Digital News Faculty.*

**Required Journalism Classes** 14

JOURN 4400 Introduction to News Editing 2

Select two of the following: 6

JOURN 4450 News Reporting

JOURN 4460 Advanced News Reporting

JOURN 4804 Convergence Reporting

Select one of the following: 3

JOURN 4406 News Editing

JOURN 4806 Convergence Editing and Producing

Select one of the following capstones: 3

JOURN 4990 Journalism and Democracy

JOURN 4992 Reporting, Editing and Marketing of Converged Media

**Suggested Journalism Electives**

Select 11 credits from the following: 11

JOURN 4150 Using Infographics

JOURN 4406 News Editing

JOURN 4410 Intermediate Writing

JOURN 4416 Science, Health and Environmental Writing

JOURN 4418 Critical Reviewing

## News Editing

Students in this Interest Area learn the fundamentals of editing to correct and present copy for publication; content management, selection and display; how to evaluate content; copy flow and time management needed for publishing on deadline, whether that be at a set time or throughout a 24-hour cycle. The program of study prepares students for jobs in online and print publications, including newspapers, magazines and nonprofit organizations. *Administered by the Print and Digital News Faculty.*

**Required Journalism Classes** 14

JOURN 4400 Introduction to News Editing 2

JOURN 4406 News Editing 3

JOURN 4450 News Reporting 3

JOURN 4500 News Design 3

JOURN 4990 Journalism and Democracy (capstone) 3

**Suggested Journalism Electives**

Select 11 credits from the following: 11

JOURN 4050 Communications Practice (see advisor for correct sections)

or JOURN 4350 Problems in Journalism

JOURN 4150 Using Infographics

JOURN 4408 Magazine Editing

JOURN 4502 Multimedia Planning and Design

JOURN 4508 Information Graphics

JOURN 4510 Visual Communication

JOURN 4554 Visual Editing for Multimedia

JOURN 4700 Participatory Journalism

JOURN 4710 Newspaper Management

JOURN 4738 General Semantics in Journalism

JOURN 4804 Convergence Reporting

JOURN 4806	Convergence Editing and Producing
JOURN 4812	Online Audience Development
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
<b>Suggested Non-Journalism Electives</b>	
ENGLISH/ LINGST 4600	Structure of American English
ENGLISH/ LINGST 4640	Syntax
GEOG 3040	Introduction to Geographic Information Systems GIS
IS_LT 4360	Introduction to Web Development
IS_LT 4364	Flash Authoring
IS_LT 4370	Intermediate Web Development
LINGST/PHIL 4100	Philosophy of Language
NAT_R 4325	Introduction to Geographic Information Systems
POL_SC 4000	Introductory Statistics for Political Science

## News Design

This Interest Area teaches students to tell stories using the tools of visual journalism. Students learn to make decisions about the framing and packaging of information, and the effects of those decisions on user perceptions. Through hands-on-work in the Columbia Missourian newsroom, students gain real-world experience that prepares them to organize information and be clear visual communicators. The program of study prepares students for jobs in online and print publications, including newspapers, magazines and nonprofit organizations. *Administered by the Print and Digital News Faculty.*

<b>Required Journalism Classes</b>		14
JOURN 4400	Introduction to News Editing	2
JOURN 4406	News Editing	3
JOURN 4450	News Reporting	3
JOURN 4500	News Design	3
JOURN 4990	Journalism and Democracy (capstone)	3
<b>Suggested Journalism Electives</b>		
Select 11 credits from the following:		11
JOURN 4050	Communications Practice (see advisor for correct sections)	
or JOURN 4350	Problems in Journalism	
JOURN 4430	Computer-Assisted Reporting	
JOURN 4440	Mapping for Stories and Graphics	
JOURN 4502	Multimedia Planning and Design	
JOURN 4506	Magazine Design	
JOURN 4508	Information Graphics	
JOURN 4510	Visual Communication	
JOURN 4550	Basic Photography and Photo Editing	
JOURN 4554	Visual Editing for Multimedia	
JOURN 4940	Internship in Journalism	
JOURN 4950	Understanding Audiences	
<b>Suggested Non-Journalism Electives</b>		
AR_H_A 3850	American Art and Culture, 1913-Present	

ART_GRDN 2410	Graphic Design I
ART_PHOT 2600	Beginning Photography
INFOTC 3640	Digital Effects
INFOTC 4500	Team-Based Mobile Device Application Development
IS_LT 4364	Flash Authoring
IS_LT 4360	Introduction to Web Development
IS_LT 4370	Intermediate Web Development
ART_GNRL 2030 & 2030H	Context and Culture and Context and Culture - Honors
MUSIC_NM 2306 & M2306H	Perceiving Musical Traditions and Styles and Perceiving Musical Traditions and Styles - Honors
THEATR 3770	The Theatre Experience: From Page to Stage and Screen

## Science and Health Journalism (Interdisciplinary)

This Interest Area educates students in the skills and theory of journalistic coverage of the specialized fields of science, health, environment and engineering. The program prepares students for jobs as journalism professionals at newspapers, magazines, online publications and radio-television operations. *Administered by the Print and Digital News Faculty.*

<b>Required Journalism Classes</b>		14
JOURN 4416	Science, Health and Environmental Writing	3
JOURN 4428	Health Reporting Skills	2
Select one of the following:		3
JOURN 4450	News Reporting	
JOURN 4804	Convergence Reporting	
Select one of the following:		3
JOURN 4406	News Editing	
JOURN 4460	Advanced News Reporting	
JOURN 4806	Convergence Editing and Producing	
Select one of the following capstones:		3
JOURN 4990	Journalism and Democracy	
JOURN 4992	Reporting, Editing and Marketing of Converged Media	
<b>Suggested Journalism Electives</b>		
Select 11 credits from the following:		11
JOURN 4410	Intermediate Writing	
JOURN 4414	Field Reporting on the Food System and Environment	
JOURN 4430	Computer-Assisted Reporting	
JOURN 4436	Investigative Reporting	
JOURN 4730	Journalism and Conflict	
JOURN 4940	Internship in Journalism	
JOURN 4950	Understanding Audiences	
<b>Suggested Non-Journalism Electives</b>		
AG_EC 2070	Environmental Economics and Policy	
ATM_SC 1050	Introductory Meteorology	

ATM_SC 3600	Climates of the World
BIO_SC 4978	Cancer Biology
ENGLSH 4045	Rhetorical Studies
ENV_SC 1100	Introduction to Environmental Science
ENV_SC 3290	Soils and the Environment
F_S 1030	Food Science and Nutrition
F_S 1010	Introduction to Viticulture and Enology
F_S 2131	Dairy Products Evaluation
F_S 2195	Grapes and Wines of the World
F_S 3190	Study Abroad: International Meat, Dairy and Enology
F_S 3240	Principles of Viticulture I
F_W 3400	Water Quality and Natural Resource Management
HLTH_SCI 4300	Health Care in the United States
HTH_PR 4310	Health Policy for the Health Professional
NAT_R 1060	Ecology and Conservation of Living Resources
NAT_R 1070	Ecology and Renewable Resource Management
RU_SOC 4370	Environmental Sociology
SOIL 2100	Introduction to Soils

## Sports Journalism

This Interest Area is for those interested in pursuing a career in sports journalism at any level. Covering sports today includes not only knowing the games but also knowing about the larger financial, legal and ethical issues in sports. Students in this interest area have an opportunity to work across media platforms to gain experience in covering games, finding in-depth issue and feature stories and covering breaking news in sports. Students choose a core course of study through a specific emphasis area (convergence journalism (p. 557), magazine journalism (p. 560), or print and digital news), then pick from a wide range of electives to round out their skills. Electives include everything from advanced reporting and editing to business journalism, to social media techniques and community outreach.

<b>Required Journalism Classes</b>	15	
Select one of the following:	3	
JOURN 4450	News Reporting	
JOURN 4804	Convergence Reporting	
Select one of the following:	3	
JOURN 4460	Advanced News Reporting	
JOURN 4806	Convergence Editing and Producing	
Select one of the following:		
JOURN 4410	Intermediate Writing	
JOURN 4814	Multimedia Sports Journalism	
<b>Required:</b>		
JOURN 4422	Sports Journalism **	3
Select one of the following:	3	
JOURN 4990	Journalism and Democracy	
JOURN 4992	Reporting, Editing and Marketing of Converged Media	
<b>Suggested Journalism Electives</b>		
Select 10 credits from the following:	10	

JOURN 4148	Interviewing Essentials
JOURN 4150	Using Infographics
JOURN 4406	News Editing
JOURN 4410	Intermediate Writing
JOURN 4416	Science, Health and Environmental Writing
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4440	Mapping for Stories and Graphics
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication
JOURN 4550	Basic Photography and Photo Editing
JOURN 4950	Understanding Audiences
JOURN 4700	Participatory Journalism
JOURN 4718	Law and the Courts
JOURN 4728	Confronting Controls on Information
JOURN 4738	General Semantics in Journalism
JOURN 4940	Internship in Journalism
JOURN 4986	Advanced Writing
<b>Suggested Non-Journalism Electives</b>	
P_R_TR 1080	Introduction to Sport Management
P_R_TR 1081	Sport Facility Design
P_R_TR 2082	Domestic and International Sports Environment
P_R_TR 2083	Technological Advancement in Sport
P_R_TR 3185	Sports Economics and Finance
P_R_TR 3282	Governance and Policy in Sport and Leisure
P_R_TR 4385	Legal Aspects of Sport
HSP_MGMT 1505	Fundamentals of Sport Venue Management
HSP_MGMT 3510	Guest Service Management: Delivering the Fan Experience
HSP_MGMT 3515	Sport Venue Operation Management
HSP_MGMT 4520	The Business of Sport Venue Management
HSP_MGMT 4525	Sport Venue Design and Risk Management

\*\* Note: Students who want to do sports reporting with KOMU must be in or have taken JOURN 4308 Broadcast News III.

## Watchdog Journalism (Interdisciplinary)

This Interest Area is for journalism students interested in learning the skills of investigative and computer-assisted reporting across platforms. It allows students to add a strong investigative-watchdog focus and emphasizes the use of data analysis in reporting. The program encourages students to develop a specialty area, such as covering health care or religion, but that is not required. Similarly, it encourages students to take basic courses in other subject areas that will give them important skills, such as introductory accounting (though again, this is not required). Students will gain the skills to work in computer-assisted reporting or investigative reporting. Students choose a core course of study through a specific emphasis area (convergence journalism (p. 557), magazine journalism (p. 560), print and digital news), then pick from a wide range of electives to round out their skills. Electives include everything from

advanced reporting and editing to business journalism, to social media techniques and community outreach.

**Required Journalism Classes** 15

JOURN 4430	Computer-Assisted Reporting	3
JOURN 4436	Investigative Reporting	3
Select one of the following:		3
JOURN 4450	News Reporting	
JOURN 4804	Convergence Reporting	
Select one of the following:		3
JOURN 4460	Advanced News Reporting	
JOURN 4806	Convergence Editing and Producing	
Select one of the following capstones:		3
JOURN 4990	Journalism and Democracy	
JOURN 4992	Reporting, Editing and Marketing of Converged Media	

**Suggested Journalism Electives**

Select 10 credits from the following: 10

JOURN 4150	Using Infographics	
JOURN 4300	Broadcast News I	
JOURN 4330	From Murrow to Moore: What Good Journalists Read	
JOURN 4414	Field Reporting on the Food System and Environment	
JOURN 4416	Science, Health and Environmental Writing	
JOURN 4426	Religion Reporting and Writing	
JOURN 4438	Business and Economics Reporting	
JOURN 4440	Mapping for Stories and Graphics	
JOURN 4508	Information Graphics	
JOURN 4510	Visual Communication	
JOURN 4550	Basic Photography and Photo Editing	
JOURN 4700	Participatory Journalism	
JOURN 4718	Law and the Courts	
JOURN 4728	Confronting Controls on Information	
JOURN 4940	Internship in Journalism	
JOURN 4950	Understanding Audiences	
JOURN 4986	Advanced Writing	

**Suggested Non-Journalism Electives**

ACCTCY 2010	Introduction to Accounting	
ACCTCY 2026	Accounting I	
ECONOM 3229	Money, Banking and Financial Markets	
ECONOM 4315	Public Economics	
GEOG 2840	Introduction to Mapping Science	
GEOG 3040	Introduction to Geographic Information Systems GIS	
GEOG 3840	Cartography	
NAT_R 4325	Introduction to Geographic Information Systems	
POL_SC 2100	State Government	
POL_SC 2200	The Judicial Process	
POL_SC 4000	Introductory Statistics for Political Science	

POL_SC 4100	Political Parties and Election Campaigns
POL_SC 4320	Public Policy

## Semester Plan

See your advisor to set up a semester plan.

## BJ in Journalism with Emphasis in Radio-Television Journalism

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

### Radio-Television Interest Areas

#### Radio-Television Producing

This Interest Area teaches students how to structure, write and build a newscast. They will receive instruction in newsroom leadership and practice guiding a newscast to completion in the professional newsrooms and control rooms of KBIA Radio and KOMU-TV. *Administered by the Radio-TV Faculty.*

**Required Journalism Classes** 15

JOURN 4300	Broadcast News I	3
JOURN 4306	Broadcast News II	3
JOURN 4308	Broadcast News III	3
JOURN 4310	News Producing	3

Select one of the following capstones: 3

JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4976	Seminar in Radio/TV News
JOURN 4978	Media Management and Leadership

**Suggested Journalism Electives**

Select 10 credits from the following: 10

SCI_AG_J 4480	Will Write for Food (and Wine)	
JOURN 4116	Managing and Leading People	
JOURN 4320	Advanced Broadcast Reporting	
JOURN 4328	Advanced News Communication	
JOURN 4330	From Murrow to Moore: What Good Journalists Read	
JOURN 4416	Science, Health and Environmental Writing	
JOURN 4418	Critical Reviewing	
JOURN 4426	Religion Reporting and Writing	
JOURN 4430	Computer-Assisted Reporting	
JOURN 4436	Investigative Reporting	
JOURN 4438	Business and Economics Reporting	
JOURN 4506	Magazine Design	
JOURN 4508	Information Graphics	
JOURN 4510	Visual Communication	
JOURN 4550	Basic Photography and Photo Editing	
JOURN 4650	International Issues Reporting	
JOURN 4554	Visual Editing for Multimedia	



JOURN 4700	Participatory Journalism
JOURN 4716	Women and the Media
JOURN 4720	Internet Law
JOURN 4804	Convergence Reporting
JOURN 4806	Convergence Editing and Producing
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4976	Seminar in Radio/TV News
JOURN 4978	Media Management and Leadership

**Suggested Non-Journalism Electives**

ANTHRO 1000	General Anthropology
ANTHRO 1060	Human Language
ART_GNRL 1020	Appreciation of Art
ART_GRDN 1400	Beginning Digital Imaging
ART_GRDN 2410	Graphic Design I
AR_H_A 2830	American Art and Architecture
AR_H_A 2850	Introduction to Visual Culture
COMMUN 1200	Public Speaking
COMMUN 3441	Nonverbal Communication
COMMUN 3571	Group Decision Making Processes
COMMUN 3575	Business and Professional Communication
ENGLISH 2510	Creative Writing: Intermediate Fiction
GEOG 1100	Regions and Nations of the World I
GEOG 2720	Urban Geography
HIST 1100	Survey of American History to 1865
HIST 1200	Survey of American History Since 1865
HIST 1500	Foundations of Western Civilization
HIST 1800	The Making Modern Africa
MANGMT 3000	Principles of Management
MRKTNG 3000	Principles of Marketing
MRKTNG 4050	Marketing Research
MRKTNG 4220	Consumer Behavior
MUSIC_NM 1211	Fundamentals of Music I
MUSIC_NM 1310	Masterpieces of Western Music
MUSIC_NM 1311	Jazz, Pop, and Rock
FINPLN 2183	Personal and Family Finance

PHIL 1000	General Introduction to Philosophy
PHIL 1100	Introduction to Ethics
PHIL 1200	Logic and Reasoning
PHIL 4500	Theories of Ethics
PHYSICS 1150	Concepts in Physics
POL_SC 1100	American Government
POL_SC 3000	Introduction to Political Research
PSYCH 1000	General Psychology
PSYCH 2310	Social Psychology
REL_ST 1100	Introduction to Religion
SOCIOL 1000	Introduction to Sociology
THEATR 1400	Acting for Non-Majors

**Radio-Television Reporting and Anchoring**

This Interest Area will teach students how to gather the information they will need to write and edit stories for radio, television and the Internet. They also will learn on-air delivery techniques and receive instruction on how best to deliver their journalism. They will do so in the professional newsroom settings of KBIA Radio and KOMU-TV. *Administered by the Radio-TV Faculty.*

<b>Required Journalism Classes</b>	<b>16</b>	
JOURN 4300	Broadcast News I	3
JOURN 4306	Broadcast News II	3
JOURN 4308	Broadcast News III	3
JOURN 4320	Advanced Broadcast Reporting	3
JOURN 4328	Advanced News Communication	1
Select one of the following capstones:		3
JOURN 4974	Advanced Internet Applications for Radio/TV News	
JOURN 4976	Seminar in Radio/TV News	
JOURN 4978	Media Management and Leadership	

<b>Selected Journalism Electives</b>	<b>9</b>	
Select 9 credits from the following:		
JOURN 4116	Managing and Leading People	
JOURN 4310	News Producing	
JOURN 4330	From Murrow to Moore: What Good Journalists Read	
JOURN 4416	Science, Health and Environmental Writing	
JOURN 4418	Critical Reviewing	
JOURN 4426	Religion Reporting and Writing	
JOURN 4430	Computer-Assisted Reporting	
JOURN 4436	Investigative Reporting	
JOURN 4438	Business and Economics Reporting	
JOURN 4506	Magazine Design	
JOURN 4508	Information Graphics	
JOURN 4510	Visual Communication	
JOURN 4550	Basic Photography and Photo Editing	
JOURN 4554	Visual Editing for Multimedia	
JOURN 4650	International Issues Reporting	
JOURN 4700	Participatory Journalism	
JOURN 4716	Women and the Media	
JOURN 4720	Internet Law	
JOURN 4804	Convergence Reporting	

JOURN 4806	Convergence Editing and Producing
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4976	Seminar in Radio/TV News
JOURN 4978	Media Management and Leadership

**Suggested Non-Journalism Electives**

ANTHRO 1000	General Anthropology
ANTHRO 1060	Human Language
ART_GNRL 1020	Appreciation of Art
ART_GRDN 1400	Beginning Digital Imaging
ART_GRDN 2410	Graphic Design I
AR_H_A 2830	American Art and Architecture
AR_H_A 2850	Introduction to Visual Culture
COMMUN 1200	Public Speaking
COMMUN 3441	Nonverbal Communication
COMMUN 3571	Group Decision Making Processes
COMMUN 3575	Business and Professional Communication
ENGLISH 2510	Creative Writing: Intermediate Fiction
GEOG 1100	Regions and Nations of the World I
GEOG 2720	Urban Geography
HIST 1100	Survey of American History to 1865
HIST 1200	Survey of American History Since 1865
HIST 1500	Foundations of Western Civilization
HIST 1800	The Making Modern Africa
MANGMT 3000	Principles of Management
MRKTNG 3000	Principles of Marketing
MRKTNG 4050	Marketing Research
MRKTNG 4220	Consumer Behavior
MUSIC_NM 1211	Fundamentals of Music I
MUSIC_NM 1310	Masterpieces of Western Music
MUSIC_NM 1311	Jazz, Pop, and Rock
FINPLN 2183	Personal and Family Finance
PHIL 1000	General Introduction to Philosophy
PHIL 1100	Introduction to Ethics
PHIL 1200	Logic and Reasoning
PHIL 4500	Theories of Ethics

PHYSICS 1150	Concepts in Physics
POL_SC 1100	American Government
POL_SC 3000	Introduction to Political Research
PSYCH 1000	General Psychology
PSYCH 2310	Social Psychology
REL_ST 1100	Introduction to Religion
SOCIOL 1000	Introduction to Sociology
THEATR 1400	Acting for Non-Majors

## Radio-Television Sports Journalism

This interest area is for those students who are preparing for a career in sports journalism at any level. Covering sports today includes not only knowing the games, but also knowing about the larger financial, legal and ethical issues in sports. Students in this interest area have an opportunity to work across media platforms to gain experience in covering games, finding in-depth issue and feature stories and covering breaking news in sports. Students choose a core course of study in the radio-television journalism (p. ) emphasis area. Students then pick from a wide range of electives to round out their skills and work in other media. Electives include everything from advanced reporting and editing to business journalism, to social media techniques and community outreach.

**Required Journalism Classes** 15

JOURN 4300	Broadcast News I
JOURN 4306	Broadcast News II
JOURN 4308	Broadcast News III
JOURN 4422	Sports Journalism *

Take one of these capstones:

JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4976	Seminar in Radio/TV News
JOURN 4978	Media Management and Leadership

**Suggested Journalism Electives** 10

JOURN 4148	Interviewing Essentials
JOURN 4150	Using Infographics
JOURN 4320	Advanced Broadcast Reporting (The Sports Section)
JOURN 4406	News Editing
JOURN 4410	Intermediate Writing
JOURN 4416	Science, Health and Environmental Writing
JOURN 4436	Investigative Reporting
JOURN 4438	Business and Economics Reporting
JOURN 4440	Mapping for Stories and Graphics
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication
JOURN 4550	Basic Photography and Photo Editing
JOURN 4950	Understanding Audiences
JOURN 4700	Participatory Journalism
JOURN 4718	Law and the Courts
JOURN 4728	Confronting Controls on Information
JOURN 4738	General Semantics in Journalism
JOURN 4940	Internship in Journalism
JOURN 4986	Advanced Writing

**Suggested Non-Journalism Electives**

P_R_TR 1080	Introduction to Sport Management
P_R_TR 1081	Sport Facility Design
P_R_TR 2082	Domestic and International Sports Environment
P_R_TR 2083	Technological Advancement in Sport
P_R_TR 2281	The Business of Sport
P_R_TR 3185	Sports Economics and Finance
P_R_TR 3282	Governance and Policy in Sport and Leisure
P_R_TR 4385	Legal Aspects of Sport
HSP_MGMT 1505	Fundamentals of Sport Venue Management
HSP_MGMT 3510	Guest Service Management: Delivering the Fan Experience
HSP_MGMT 3515	Sport Venue Operation Management
HSP_MGMT 4520	The Business of Sport Venue Management
HSP_MGMT 4525	Sport Venue Design and Risk Management

\* Students who want to do sports reporting with KOMU-TV must be in or have taken JOURN 4308 Broadcast News III.

## Radio-Television Watchdog Journalism

This interest area is for journalism students interested in learning the skills of investigative and computer-assisted reporting for radio and television news. Students choose their core course of study in radio-television journalism (p. ). The interest area builds student skills in investigative reporting and using data analysis in reporting. It also encourages, but does not require students to use elective coursework to develop a specialty area such as business news, health care or religion reporting. Through this interest area, students will gain the skills to work as an investigate reporter or producer in radio or television news.

### Required Journalism Classes 18

JOURN 4430	Computer-Assisted Reporting
JOURN 4436	Investigative Reporting *
JOURN 4300	Broadcast News I
JOURN 4306	Broadcast News II
JOURN 4308	Broadcast News III

### Take one of these capstones: 3

JOURN 4974	Advanced Internet Applications for Radio/TV News
JOURN 4976	Seminar in Radio/TV News
JOURN 4978	Media Management and Leadership

### Suggested Journalism Electives 7

JOURN 4150	Using Infographics
JOURN 4330	From Murrow to Moore: What Good Journalists Read
JOURN 4414	Field Reporting on the Food System and Environment
JOURN 4416	Science, Health and Environmental Writing
JOURN 4426	Religion Reporting and Writing
JOURN 4438	Business and Economics Reporting
JOURN 4440	Mapping for Stories and Graphics
JOURN 4508	Information Graphics
JOURN 4510	Visual Communication

JOURN 4550	Basic Photography and Photo Editing
JOURN 4700	Participatory Journalism
JOURN 4718	Law and the Courts
JOURN 4728	Confronting Controls on Information
JOURN 4940	Internship in Journalism
JOURN 4950	Understanding Audiences
JOURN 4986	Advanced Writing

### Suggested Non-Journalism Electives

ACCTCY 2010	Introduction to Accounting
ACCTCY 2026	Accounting I
ECONOM 3229	Money, Banking and Financial Markets
ECONOM 4315	Public Economics
GEOG 2840	Introduction to Mapping Science
GEOG 3040	Introduction to Geographic Information Systems GIS
GEOG 3840	Cartography
NAT_R 4325	Introduction to Geographic Information Systems
POL_SC 2100	State Government
POL_SC 2200	The Judicial Process
POL_SC 4000	Introductory Statistics for Political Science
POL_SC 4100	Political Parties and Election Campaigns
POL_SC 4320	Public Policy

\* Students who want to do investigative work with KOMU-TV must be in or have taken JOURN 4308 Broadcast News III.

## Semester Plan

See your advisor to set up a semester plan

## BJ in Journalism with Emphasis in Strategic Communication

### Major Program Requirements

Students must complete all university requirements (p. 17), including general education (p. 18), in addition to the degree requirements below.

## Strategic Communication Interest Areas

### Strategic Communication

This Interest Area educates students in the principles and practice of all communication designed to create a desired response from a given audience. It includes focused study and hands-on practice within the Pathways of Account Management, Art Direction, Copywriting, Media Planning, Public Relations, Research and Interactive-and prepares students for careers in these seven areas. Crossover between these Pathways is permissible and encouraged. *Administered by the Strategic Communication Faculty.*

<b>Required Journalism Classes</b>		12
JOURN 4200	Principles of Strategic Communication	3
JOURN 4204	Introduction to Strategic Writing and Design	3
JOURN 4952	Strategic Communication Research I	3

JOURN 4970	Strategic Campaigns (capstone)	3
<b>Required Non-Journalism Electives</b>		<b>6</b>
MRKTNG 3000	Principles of Marketing	3
Another MRKTNG Elective		3
<b>Suggested Journalism Electives for Account Management</b>		<b>13</b>
JOURN 4218	MoJo Advertising Staff	
JOURN 4236	Psychology in Advertising	
JOURN 4248	Media Strategy and Planning	
JOURN 4250	Management of Strategic Communication	
JOURN 4256	Public Relations	
JOURN 4262	Interactive Advertising I	
<b>Suggested Journalism Electives for Interactive</b>		<b>13</b>
JOURN 4218	MoJo Advertising Staff	
JOURN 4236	Psychology in Advertising	
JOURN 4262	Interactive Advertising I	
JOURN 4263	Interactive Advertising II	
<b>Suggested Journalism Electives for Research</b>		<b>13</b>
JOURN 4218	MoJo Advertising Staff	
JOURN 4236	Psychology in Advertising	
JOURN 4250	Management of Strategic Communication	
JOURN 4262	Interactive Advertising I	
<b>Suggested Journalism Electives for Art Direction</b>		<b>13</b>
JOURN 4218	MoJo Advertising Staff	
JOURN 4220	Creative Portfolio	
JOURN 4228	Strategic Design and Visuals II	
JOURN 4236	Psychology in Advertising	
JOURN 4262	Interactive Advertising I	
<b>Suggested Journalism Electives for Public Relations</b>		<b>13</b>
JOURN 4218	MoJo Advertising Staff	
JOURN 4236	Psychology in Advertising	
JOURN 4256	Public Relations	
JOURN 4262	Interactive Advertising I	
JOURN 4270	Public Relations Writing	
<b>Suggested Journalism Electives for Copywriting</b>		<b>13</b>
JOURN 4208	Strategic Writing II	
JOURN 4218	MoJo Advertising Staff	
JOURN 4220	Creative Portfolio	
JOURN 4236	Psychology in Advertising	
JOURN 4262	Interactive Advertising I	
<b>Suggested Journalism Electives for Media Planning</b>		<b>13</b>
JOURN 4216	Media Sales	
JOURN 4218	MoJo Advertising Staff	
JOURN 4236	Psychology in Advertising	
JOURN 4248	Media Strategy and Planning	
JOURN 4262	Interactive Advertising I	
<b>Suggested Strategic Communication Electives</b>		
JOURN 4130	Account Services	
JOURN 4136	Creative Techniques	
JOURN 4138	Public Relations Techniques	
JOURN 4140	Interactive Techniques	
JOURN 4146	Strategic Communication Techniques	

JOURN 4258	Global Communication	3
<b>Suggested Journalism Electives</b>		
JOURN 4116	Managing and Leading People	
JOURN 4126	Digital Audio and Visual Basics for Journalists	
JOURN 4400	Introduction to News Editing	
JOURN 4506	Magazine Design	
JOURN 4510	Visual Communication	
JOURN 4940	Internship in Journalism	
<b>Suggested Non-Journalism Electives</b>		
ANTHRO 1000	General Anthropology	
ANTHRO 1060	Human Language	
ART_GRDN 1400	Beginning Digital Imaging	
ART_GNRL 1020	Appreciation of Art	
ART_DRAW 1050	Drawing I	
ART_GRDN 2410	Graphic Design I	
AR_H_A 1110	Ancient and Medieval Art	
AR_H_A 2850	Introduction to Visual Culture	
COMMUN 1200	Public Speaking	
COMMUN 3571	Group Decision Making Processes	
COMMUN 3572	Argument and Advocacy	
COMMUN 3575	Business and Professional Communication	
ENGLSH 1160	Themes in Literature	
ENGLSH 1300	Readings in American Literature	
ENGLSH 1800	Introduction to Film Studies	
ENGLSH 2140	Twentieth-Century Literature	
ENGLSH 2150	Popular Literature	
ENGLSH 2510	Creative Writing: Intermediate Fiction	
ENGLSH 2560	Beginning Playwriting	
FILM_S 2520	Introduction to Film Production	
GEOG 1100	Regions and Nations of the World I	
GEOG 2720	Urban Geography	
HIST 1400	American History	
HIST 1500	Foundations of Western Civilization	
HIST 1510	History of Modern Europe	
HIST 1800	The Making Modern Africa	
HIST 1830	Survey of East Asian History	
HIST 1850	Latin America Since Independence	
GN_HON 2111H	The Ancient World	
GN_HON 2112H	The Middle Ages and the Renaissance	
GN_HON 2113H	The Early Modern World: The 17th-19th Centuries Enlightenment	

GN_HON 2114H	The Modern Era
MRKTNG 4050	Marketing Research
MRKTNG 4220	Consumer Behavior
MUSIC_NM 1211	Fundamentals of Music I
MUSIC_NM 1310	Masterpieces of Western Music
MUSIC_NM 1311	Jazz, Pop, and Rock
FINPLN 2183	Personal and Family Finance
PHIL 1000	General Introduction to Philosophy
PHIL 1200	Logic and Reasoning
PHIL 2300	Philosophy and Human Nature
PHIL 2420	Ethical Issues in Business
PHYSICS 1100	Science and Inventions
PHYSICS 1150	Concepts in Physics
PSYCH 1000	General Psychology
PSYCH 2310	Social Psychology
REL_ST 1100	Introduction to Religion
SOCIOLOG 1000	Introduction to Sociology
THEATR 1100	The Theatre in Society
THEATR 1400	Acting for Non-Majors
THEATR 2800	Principles of Script Analysis

### International Strategic Communication

The next generation of strategic communication students must be equipped to work in a global environment. This Interest Area is designed to capitalize on Missouri's international reputation and its international resources by placing under one umbrella the school's existing Study Abroad opportunities, its internationally focused media and multimedia projects with global partners. Students in this area take Strategic Communication courses to complement their international interests. *The Strategic Communication Interest Area is administered by the School's International Programs Office.*

<b>Required Journalism Classes</b>	12	
JOURN 4200	Principles of Strategic Communication	3
JOURN 4204	Introduction to Strategic Writing and Design	3
JOURN 4952	Strategic Communication Research I	3
JOURN 4970	Strategic Campaigns (capstone)	3
<b>Required Non-Journalism Electives</b>	6	
MRKTNG 3000	Principles of Marketing	3
Another MRKTNG Elective		3
<b>Suggested Journalism Electives</b>	13	
<b>Journalism Study Abroad (It is recommended that the student study abroad in the second semester of their junior year or the first semester of their senior year.)</b>	6	
Select one of the following:		
JOURN 4050	Communications Practice	
JOURN 4198	Area Seminar	
JOURN 4258	Global Communication	

JOURN 4350	Problems in Journalism	
JOURN 4650	International Issues Reporting	
JOURN 4656	International News Media Systems	
JOURN 4658	International Journalism	
<b>Suggested Non-Journalism Electives</b>		
AG_EC 3150	International Agribusiness	
AG_EC 3271	International Agricultural Development	
AG_EC 3272	International Food Trade and Policy	
ANTHRO 3700	Cultures of Europe	
ANTHRO 3780	Cultures of Southeast Asia	
ANTHRO 4400	Language and Culture	
ANTHRO 4790	Culture and Society in South Asia	
ATM_SC 3600	Climates of the World	
BL_STU 4230	Women, Development, and Globalization	
CHINSE 3300	Chinese Traditions and Global Integration	
FINANC 4720	International Finance	
GEOG 1100	Regions and Nations of the World I	
GEOG 3780	World Political Geography: Patterns and Processes	
HIST 3820	Twentieth Century China	
HIST 3850	Islam and the West	
HIST 3870	Social Revolution in Latin America	
HIST 4870	Southeast Asia Since the Eighteenth Century	
HLTH_SCI 3400	Global Health	
KOREAN 4220	Korean Unification	
MRKTNG 3975	Current Issues in International Marketing	
MRKTNG 3985	Problems in International Business	
MRKTNG 4720	Global Marketing	
POL_SC 1400	International Relations	
POL_SC 4400	Theories of International Relations	
POL_SC 4420	Politics of International Economic Relations	
POL_SC 4440	International Organization	
POL_SC 4500	The European Union in the Global System	
POL_SC 4540	American Foreign Policies	
POL_SC 4600	Latin American Politics	
POL_SC 4610	European Political Systems	
RU_SOC 2010	Leadership in Today's World	
RU_SOC 3235	Global Perspectives and Realities	
S_A_ST 3245	Nonviolence in the Modern World	
S_A_ST 4850	Traversing the Muslim World	
SOCIOLOG 3210	Sociology of Globalization	
SOCIOLOG 3255	Youth in Today's World	

SOCIOL 4230	Women, Development, and Globalization
T_A_M 2400	Global Consumers
T_A_M 3110	Textiles and Apparel in the Global Economy
T_A_M 4110	Global Sourcing
T_A_M 4310	Global Retailing

## Semester Plan

See your advisor to set up a semester plan.

## Minor in Journalism

### Journalism Minor Policies and Procedures

The School of Journalism’s minor consists of 15 credit hours of journalism coursework and is for students within other MU academic divisions who wish to broaden their understanding of the news media’s role in society. Courses for minors parallel MU’s broader liberal arts traditions and are not skills-oriented.

### Admissions

JOURN 1000 is open to any MU student who is a non-journalism major in good academic standing. To declare a minor, a student must be in good academic standing at MU and have completed 60 credits.

Pre-Journalism students who follow the School of Journalism’s general education requirements are preferred for admission. Pre-Journalism students who complete either JOURN 1100 and JOURN 2100 or JOURN 1100 and JOURN 2150 with a C or better (and then decide to minor within the School of Journalism) are eligible to take 9 more upper division (3000 or 4000 level course) credits within the School. Pre-Journalism students who decide to minor after completing JOURN 1100 are ineligible to take JOURN 1000.

Other MU students with a 3.0 GPA or higher are eligible on a space available basis. Journalism majors are ineligible for the journalism minor program.

All students apply to be a journalism minor and complete a form that is available from a designated staff liaison in the Journalism Student Services Office, 76 Gannett Hall. Journalism minors must apply to be eligible to register for courses.

All admissions and other requirements apply to both current and transfer students. Transfer students may use up to three credit hours of approved journalism transfer credit toward a journalism minor.

### Courses

Up to 15 credits selected from the following classes:

JOURN 1000	The News Media: Journalism and Advertising in a Democratic Society	3
or JOURN 1100	Principles of American Journalism	
JOURN 2000	Cross-Cultural Journalism	3
JOURN 3000	History of American Journalism	3
JOURN 4000	Communications Law	3

JOURN 2100 News and JOURN 2150 Multimedia Journalism are not open to journalism minors. However, Pre-Journalism students who

complete JOURN 2100 or JOURN 2150 as part of their requirements and then decide to minor in journalism may count these courses toward their minor.

Other eligible courses: (all require permission of course instructor emailed or sent to the designated advisor for minors):

JOURN 4568	History of Photojournalism	3
JOURN 4656	International News Media Systems	3
JOURN 4658	International Journalism	3
JOURN 4990	Journalism and Democracy	3

These are the classes the School of Journalism currently offers for international and U.S. exchange, MU interdisciplinary and general studies majors plus non-degree seeking undergraduate students. These courses are not skills oriented and frequently have room for non-majors to enroll. JOURN 1000 also was intended as a class for non-majors.

The selected courses focus on news media and society issues. Students can choose whatever combination of classes they wish to reach 15 credits. Journalism minors are ineligible to take any other courses with the School of Journalism. Journalism minors may take no more than 15 credits within the School of Journalism.

### Registration

MU students can register for JOURN 1000 through regular procedures. For all other classes, journalism minors place their course preference on a waiting list. Students are eligible to enroll after course registration by journalism majors is completed. The School’s designated liaison for journalism minors will inform students when course space is available following registration periods each semester.

### Academic Status

Journalism minors are subject to probationary or suspension status as determined by the division in which each student’s major resides. Journalism minors who receive lower than a C- in any journalism course must repeat it and complete with a C- or better. Journalism courses may only be repeated one time. Upon repeating a course, if a student fails to earn a C- or better, the student is no longer eligible for the Journalism Minor.

### Fees

Journalism minors must pay School of Journalism activity fees for all journalism courses.

### Advising

Journalism minors will not be assigned a faculty advisor or an academic advisor within the Journalism School. Academic advising occurs in the division of each student’s major. Journalism minors are free to consult with the school’s designated liaison and with the School of Journalism faculty on course-specific matters at any time. Journalism minors also can consult on longer-range career and professional issues with journalism faculty. However, faculty advising priority is given to journalism majors.

### Career Services

Journalism minors are ineligible to interview with prospective employers who visit the School of Journalism. Journalism minors should interview employers in their home division. The School of Journalism’s placement website is open for use by journalism minors. Journalism minors can

consult with the School of Journalism’s Career Service Coordinator, although priority is given to journalism majors and Pre-Journalism students.

## Other Disciplinary Actions

Disciplinary actions for Journalism minors are the same as for Journalism majors. All cases of alleged academic misconduct will be immediately forwarded and reviewed by the MU Provost’s office. All cases of classroom misconduct will be immediately forwarded and reviewed by the office of the Vice Chancellor for Student Affairs.

## Graduate

### MA in Journalism

#### Admission Contact Information

Ginny Cowell (cowellvj@missouri.edu)  
 179 Gannett Hall  
 Columbia, MO 65211  
 573-882-4852  
<http://www.journalism.missouri.edu/graduate/masters/>  
<http://journalism.missouri.edu/programs/online/>

#### About the Master of Arts

The program leading to the MA degree is designed to accommodate several objectives, including: comprehensive professional preparation for careers in the news media and mass communications; expansion of previous professional preparation and experience (e.g. newspaper editing) into a new area (e.g. broadcasting reporting); comprehensive academic preparation for careers in journalism teaching and research; and combinations of the three.

## Degree Options

### Program Models

Students choose from more than 20 program models, covering the full range of skills and media of journalism. Because the faculty periodically updates these models, students should visit the school’s Web site for the latest details. In addition to the course work in any model, students complete either a thesis or a professional project. Students who make progress on the degree requirements and maintain at least a B average each semester are considered to be in good standing.

### Five-year Bachelor to Master Program

Another option for students who seek a master’s degree is the 5-year bachelor to master’s program (<http://journalism.missouri.edu/programs/masters/models-and-programs/five-year-bjma-models>). To be eligible for this option, students must have completed a bachelor’s degree in journalism from Missouri. Students following the 5-year plan are expected to carry 10-12 hours per semester and will graduate after completion of two semesters of course work and a third semester of project or thesis. Only graduates of Missouri Journalism’s undergraduate program are eligible for the BJ/MA program.

### Joint Journalism and Law Programs

The School of Journalism and the School of Law have created joint programs (<http://journalism.missouri.edu/programs/masters/models-and-programs/journalism-law-programs>) that provide an opportunity to earn

a MA in Journalism and either a JD or a LLM from Law. Students in the joint programs complete one of the journalism models and the course requirements for the law degree with a block of courses that are used for both degrees.

### Dual-degree option with Masters of Public Health

The School of Journalism and the program in Public Health have created a dual-degree option (p. 629) that allows students to earn a journalism degree in reporting or strategic communication with an emphasis in public health. Students complete a block of courses in public health, as well as in journalism, and complete the dual degree with a public health internship and capstone, in which the focus is on journalism or strategic communication.

### Distance Learning

Professional journalists or others who cannot travel to mid-Missouri to attend the on-campus program might consider doing their program in an online format. Health communication, interactive media, media management and strategic communication models are available through distance learning to applicants who have a minimum of three years professional journalism-related experience. Students in the online program are required to make two short visits, two to three days each, to campus during their program. Learn more about our online master’s programs here <http://journalism.missouri.edu/graduate/online/>.

### Master’s Admission Criteria

#### Campus program deadlines:

Fall deadline: January 1  
 Spring deadline: September 1

#### Online program deadlines:

Fall deadline: July 1  
 Spring deadline: November 15  
 Summer deadline: April 15

- Minimum Academic IELTS scores:

Item	Score
Listening	
Reading	
Speaking	7.0
OVERALL Score	7.0

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
Speaking: 25	
100	600

- Suggested GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1100
On or After August 1, 2001	V: 153-160; Q: 144-148

- Minimum GPA: 3.0 in last 60 hours

**Note:** Deadlines are adhered to strictly, and no applicant is considered for admission until all required information is received.

### Required Application Materials

To the Graduate School  
 All required Graduate School documents

*To the Journalism Master's Program:*

Please upload the following application materials into the online Graduate School application in Apply Yourself:

- 3 essays as specified on Departmental application website
- Résumé
- 3 letters of recommendation (use the online Graduate School application system)

Please submit 2 hard copy sets of official transcripts and official GRE scores to:

Earl English Graduate Studies Center  
 Missouri School of Journalism  
 University of Missouri  
 179 Gannett Hall  
 Columbia, MO 65211-1200

## Financial Aid from the Program

Limited fellowships, assistantships, scholarships and other financial aid opportunities are available. All applicants for admission are considered for any available funding. No separate application form is needed. Check the program Web site or ask the program contact for details.

## Plan of Study

Two-year students are required to complete a minimum of 37 hours, at least half of which must be in 8000-level courses. Five-year BJ-MA students complete a minimum of 30 hours (15 hours at the 8000-level). Specific course requirements vary depending on the option selected.

## Professional Project or Thesis

Students must enroll in either the Project Seminar or the Thesis Seminar in the semester prior to embarking on their professional project or thesis. These seminar courses guide students in developing proposals for their professional project or thesis. After proposal approval, students enroll in 8190, Area Problem (for projects) or 8090, Research (for Thesis). Students earn an additional nine credit hours for either the professional project or thesis research.

Students in any model may choose to complete the professional project or thesis off campus. The school operates program in WASHINGTON DC, BRUSSELS and BUENOS AIRES which are supervised by full-time faculty members. In the Missouri state capital the school has a program focusing on public affairs reporting in any medium. Other off-campus opportunities can be arranged.

## Length of Study

The degree must be earned within eight years of beginning the program.

## PhD in Journalism

### Admission Contact Information

Ginny Cowell (cowellvj@missouri.edu)  
 179 Gannett Hall  
 Columbia, MO 65211  
 573-882-4852  
<http://www.journalism.missouri.edu/graduate/doctoral/>

## About the Doctorate

The objective of the doctoral program is to develop an ability to conduct independent and advanced scholarly research and to integrate this skill with a depth of scholarship in journalism and mass communication. Although it is primarily a research degree, the PhD is designed to facilitate a variety of academic aims. Students must expand their intellectual horizons, gain a theoretical framework for examining and understanding communication and refine their own communication competencies.

## Doctoral Admission Criteria

Fall deadline: December 15  
 Spring deadline: September 1

- Minimum Academic IELTS scores:

Item	Score
Listening	
Reading	
Writing	
Speaking	7.0
OVERALL Score	7.0

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
Speaking: 25	
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	1100
On or After August 1, 2011	V: 156+; Q: 146+

- Minimum GPA: 3.0, undergraduate, 3.5, graduate

Applicants should have demonstrated interest, education or professional experience in journalism, advertising, public relations, mass communication or a related field. A degree (bachelor's or master's) in one of those fields or two years of full-time professional media experience is preferred. All required information must be received before the admission review can begin. Applicants may be required to participate in an interview with the doctoral faculty as part of the review process. Students who did not write a thesis in their master's program may be required to complete a project to demonstrate their ability to do independent research.

Deadlines for application are December 15 for fall entry and September 1 for spring. Deadlines are firm, and no applicant is considered for admission until all required information is received.

## Required Application Materials

**Step 1:** Upload the following application materials into the Graduate School's online application system:

- All required Graduate School documents
- Statement of Doctoral Objectives
- Résumé
- A 500-word abstract of your master's thesis (or thesis proposal, if your thesis is not yet complete)



- 3 letters of recommendation (use the online Graduate School application system)

**Step 2:** Submit 2 hard copy sets of official transcripts and official GRE scores to:

Earl English Graduate Studies Center  
Missouri School of Journalism  
University of Missouri  
179 Gannett Hall  
Columbia, MO 65211-1200

## Financial Aid from the Program

Doctoral students are provided assistantship and scholarship support for a maximum of six terms (three years). Contact the department for details on this financial assistance.

## Plan of Study

Doctoral study in journalism and mass communication is an interdisciplinary enterprise. The doctoral program is designed by the student in collaboration with the adviser and doctoral committee. Course selections are based on the intellectual requirements of the dissertation and the teaching areas the student wishes to pursue. No courses that focus primarily on professional skills may be counted toward the doctoral program, whether taken at the master's or the doctoral level. Courses from journalism should compose no more than two-thirds of the total credit.

Students must develop two research tools, pass qualifying and comprehensive examinations, submit and defend a dissertation, and satisfactorily meet all other requirements of the Graduate School. Doctoral Proseminar I (JOURN 9000), Doctoral Proseminar II (JOURN 9006), Doctoral Seminar (JOURN 9010) and Doctoral Research Seminar (JOURN 9087) are required of all PhD students.

## Qualifying Examination

Students are admitted to the PhD program in journalism when they have passed the doctoral seminar (qualifying examination), which must be taken the semester in which the student completes 18 hours. Graduate School regulations about comprehensive examinations, dissertations, plans of study, residency and other matters are specified in the Degree Requirements section of the catalog.

## Foreign Language & Research Tool Requirements

Students are expected to have a background in a foreign language and to develop a research tool. The language requirement may be met by three semesters of college-level foreign language courses or an equivalency acceptable to the doctoral faculty. At the discretion of the student's doctoral committee and the associate dean for graduate studies, a second tool may be used to substitute for the language requirement.

There are four research tool options:

1. competency in a second foreign language. This may be satisfied by two years of college-level work recently passed with a grade of C or better or an acceptable ETS score. A foreign language is one that is non-native or not the primary language used in the student's school system;
2. computer proficiency as evidenced by completion of two computer courses or an equivalency acceptable to the doctoral faculty;

3. two courses in statistics;
4. two 7000 or 8000-level research methods courses outside the School of Journalism.

A grade of A or B must be made in any course used for options 2, 3 or 4.

## Teaching

Doctoral students who plan to teach will participate in a teaching program. Each student's teaching skills will be evaluated in Doctoral Seminar, at which point planning for the student's future teaching opportunities begins. Most students will serve as teaching assistants in such classes as JOURN 1100, JOURN 2100, and JOURN 3000 during their third semester in the program.

In the student's fourth semester, he/she may have an additional teaching experience, either as a teaching assistant, co-instructor or instructor of record in a course. Depending on the student's ability and desire, students might teach a course independently during later semesters.

## Additional Minors and Certificates - Journalism

Undergraduate

Graduate

- Minor in Law and Conflict Resolution for Journalism Doctoral Students (p. 578)

## Graduate

### Graduate Minor in Law and Conflict Resolution for Journalism Doctoral Students

This program is designed for doctoral students who are interested in teaching and researching in journalism and law and conflict resolution in a school of journalism or communication department. Under the program, students may receive the Minor upon completion of at least 15 credits at the Law School, including both core courses and at least 6 credits of electives. The Minor will appear on the student's transcript.

#### Required Core Courses

LAW 5450	Conflict and Conflict Management	3
LAW 5760	Media Law	3
or JOURN 7000	Communications Law	

#### Electives

Students may take any available course at the Law School in satisfying this requirement. Actual course offerings and availability varies by semester, and enrollment is subject to professor approval. The following courses are ones that are expected to be generally available. They are grouped by tracks to help students more quickly identify areas of specific interest, and to develop deeper concentrations in desired areas. However, students may take any of the courses in meeting the elective requirement for the Minor. Students should consult with a member of the School of Law faculty or administration about which Law School courses or sequences may be most appropriate to the student's curricular needs.

#### General Electives

JOURN 7718	Law and the Courts	3
JOURN 7720	Internet Law	3
JOURN 8046	Controls of Information	3
BUS_AD 7330	Business Law/Regulation	2-3

#### Electives - Track 1: Civil Rights and International Law

LAW 5220	Constitutional Law *	1-4
LAW 5240	Criminal Procedure	1-3
LAW 5350	Arbitration *	1-3
LAW 5380	Bioethics Seminar	1-3
LAW 5410	Children and the Law	1-3
LAW 5415	Constitutional and Civil Rights Litigation	1-3
LAW 5435	Comparative Law	1-3
LAW 5525	Education Law	1-3

LAW 5530	Elder Law *	1-3
LAW 5540	Employment Discrimination	1-3
LAW 5565	European Union Law	1-3
LAW 5575	Family Law *	1-3
LAW 5590	Freedom of Speech and Association	1-3
LAW 5595	Gender and the Law	1-3
LAW 5620	Immigration Law	2-3
LAW 5660	International Human Rights	1-3
LAW 5665	International Law	1-3
LAW 5750	Local Government Law	1-3
LAW 5780	Mental Disability and the Law *	1-2
LAW 5865	Religious Liberty and Church-State Relations	1-3

#### Electives - Track 2: Business Law

Those students who anticipate covering general business issues as working journalists, or who anticipate careers in media management and strategic communication should consider these courses. LAW 5395 is recommended and is often a prerequisite for other courses.

LAW 5340	Antitrust Law	1-3
LAW 5350	Arbitration *	1-3
LAW 5365	Bankruptcy	1-3
LAW 5375	Basic Federal Income Taxation	1-4
LAW 5395	Business Organizations	1-4
LAW 5455	Copyright Law	1-3
LAW 5677	Internet Law and Practice	1-3
LAW 5540	Employment Discrimination	1-3
LAW 5640	Intellectual Property	1-3
LAW 5695	Labor Law	1-3
LAW 5795	Modern Payment System	1-3
LAW 5810	Negotiation *	1-3
LAW 5820	Patent Law & Policy	1-3
LAW 5880	Sales and Leases of Goods	1-3
LAW 5890	Securities Regulation	1-3
LAW 5905	Sports Law	1-3
LAW 5920	Trademark Law	1-3
LAW 5940	White Collar Crime	1-3

#### Electives - Track 3: General Law

The following courses permit students a wide range of options for exposure to law, and also permit further emphasis in civil justice, criminal justice, environmental, health care and international law, depending upon student needs and preferences.

LAW 5010	Civil Procedure I	1-3
LAW 5015	Civil Procedure II	1-3
LAW 5220	Constitutional Law *	1-4
LAW 5240	Criminal Procedure	1-3
LAW 5260	Evidence *	1-4
LAW 5310	Administrative Law	1-3
LAW 5320	Advanced Legal Research *	1-2
LAW 5350	Arbitration *	1-3
LAW 5530	Elder Law *	1-3
LAW 5545	Environmental Law	1-3

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LAW 5575	Family Law *	1-3
LAW 5615	Health Care Law: The Doctor-Patient Relationship	1-3
LAW 5700	Land Use Controls	1-3
LAW 5720	Law and Literature	1-3
LAW 5725	Law and Social Sciences	1-3
LAW 5745	Legislation	1-3
LAW 5765	Mediation *	1-3
LAW 5810	Negotiation *	1-3
LAW 5835	Products Liability	1-3
LAW 5840	Public Policy Dispute Resolution	1-3
LAW 5845	Publicly Held Corporation	3
LAW 5910	State Constitutional Law	1-2

\* Limited Enrollment. Course likely to be full. Law students have first priority.

## School of Nursing

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### Administration

Judith F. Miller, Dean

Roxanne McDaniel, Associate Dean for Academic Affairs

Vicki Conn, Associate Dean for Research

#### Office of Student Affairs

S235 Nursing School Bldg.

(573) 882-0277

The nursing program at MU began in 1901 with the establishment of Parker Memorial Hospital Training School. Today, the Sinclair School of Nursing is committed to promoting, maintaining and improving health and health-care delivery in Missouri and worldwide through nursing education, research and service. Nursing faculty combine research and education to offer students hands-on experience in the art and science of nursing.

The School of Nursing is approved by the Missouri State Board of Nursing and has national accreditation.

The undergraduate program is approved by the Missouri State Board of Nursing. The Baccalaureate Program at the University of Missouri is accredited by the Commission on Collegiate Nursing Education, One Dupont Circle, NW, Suite 530, Washington, DC 20036, (202) 887-6791.

### Undergraduate

- Admissions
- Advising
- Health Care

### Admissions

#### Traditional BSN Option

The freshman and sophomore years are designated as the “pre-nursing” years. The junior and senior years are designated as the “clinical nursing major” years. *Pre-nursing students apply for admission to the clinical major during the last semester of general education and prerequisite coursework and are admitted to the clinical nursing major on a competitive and space-available basis when prerequisite courses have been completed.* Any student who is a Nursing Scholar is guaranteed admission into the clinical nursing major. Please see the Nursing and/or Honor’s College websites for eligibility information and application details.

Each student’s application is reviewed systematically and considered holistically for each admission period. The School values MU’s Commitment to Diversity and the call of the American Nurses Association that the nursing workforce should reflect the diversity of the population. The School is also committed to rural health care and to educating nurses for practice in rural Missouri. Therefore, the School seeks to ensure that the student body includes persons from rural Missouri and persons of backgrounds that are underrepresented in the nursing workforce.

Clinical application and admission criteria include:

- Successful completion of all general education and prerequisite coursework prior to beginning clinical coursework;

- Satisfactory grades from biology, chemistry, and two of the three advanced lab sciences (microbiology, anatomy, physiology) to be eligible to apply for the clinical nursing major;
- Minimum cumulative grade-point average of 3.0 (on a 4.0 scale) for all college/university courses;
- Competitive grade-point average in nursing prerequisite courses;
- Minimum GPA of 3.0 for any nursing prerequisite courses;
- Evidence of capacity to uphold the practice standards and ethical codes of the nursing profession; and
- Evidence of motivation toward a nursing career

#### RN to BSN Option

The RN to BSN online option is for registered nurses who have earned a diploma or associate degree in nursing with a cumulative GPA of a 2.8 or higher and seek a bachelor’s degree in nursing. RN to BSN courses are offered via the Internet with limited trips to campus for some nursing course.

RN to BSN registered nurse applicants must meet the same admission standards described above for the Traditional BSN Option. They must be currently licensed to practice nursing (or eligible for licensure) in Missouri or another state. Completion of the program includes 120 credit hours. The length of the program varies, depending on equivalent prerequisite courses completed and choice of part-time or full-time enrollment.

#### BSN Accelerated Option

The BSN Accelerated Option is a 15 month program designed for individuals who hold a non-nursing degree at the baccalaureate level or higher.

Students are admitted to the Accelerated BSN Option based on the following criteria:

- A baccalaureate or higher degree from an accredited college or university.
- Two letters of reference from individuals that can attest to the student’s motivation and ability to complete a course of intensive study.
- Statement of career goals
- Description of the applicant’s view of nursing as a profession.
- A personal interview.
- Evidence of academic achievement of a 3.0 cumulative GPA or higher on a 4.0 scale on undergraduate degree.
- Completion of prerequisite courses with a minimum of a C or better
- Evidence of potential and motivation for nursing.
- Evidence of prior work success and/or ability to handle a fast-paced academic program.

A Bachelor of Science (BSN) degree is awarded at graduation, and the graduate may be eligible to take the licensing examination to become a registered nurse (RN).

#### Transfer Students

Students transferring to MU from another accredited institution of higher education or other schools and colleges within the University are subject to the regulations established by the MU Faculty Council concerning transfer of credit.

For more information regarding the transfer guidelines for the School of Nursing, call (573) 882-0277. Prior to admission, transfer students must have the following:

- Appropriate GPA for credit hours attempted, 3.0 cumulative GPA or higher
- Approval from the associate dean's office

Transfer students must apply for admission through the MU Admissions Office.

## International Students

In addition to the admission criteria described above, international students must meet the following criteria:

- Test of Written English (TWE) score of 4 or higher
- Test of Spoken English (TSE) score of 50 or higher
- TOEFL score of 600 (paper-based) or 250 (computer-based) or 100 (internet-based)
- English Language Support Program Test taken with success

## Advising

The academic advisor's office is in room S235 of the School of Nursing Building, (573) 882-0277. In addition, each clinical nursing major is assigned a faculty advisor who is available for consultation about academic or professional matters.

## Health Care

Nursing students participate in a variety of on- and off-campus educational experiences. The School of Nursing does not assume responsibility for health-care expenses incurred in either setting. Students assume responsibility for all health care for illness and injury, including emergency treatment. Student Health is located at University Physicians Medical Building, 1101 Hospital Drive, (573) 882-7481. For additional information, visit their web site at <http://studenthealth.missouri.edu/>.

## Graduate

### Nursing Graduate Programs

Sinclair School of Nursing  
S235 Sinclair School of Nursing Building  
573-882-0277  
<http://nursing.missouri.edu/>

### About the Sinclair School of Nursing

Nursing was an integral part of the Parker Memorial Hospital Training School, which served as the university's first hospital in 1901. Although a nursing program was not officially established until 1920 within the School of Medicine, MU graduated its first nursing class in 1904. Sixteen years later, the Curators approved a Graduate Nursing designation. Today, the Sinclair School of Nursing provides a rich and rewarding learning environment for our students. Our faculty includes knowledgeable and skillful teachers, respected scholars and researchers in the nursing profession, and experienced, caring practitioners. The master's program is accredited by the Commission on Collegiate Nursing Education, One Dupont Circle, NW, Suite 530, Washington, DC 20036, (202) 887-6791.

## Technology Requirements

- Student will require a computer with a video card (responsibility of the student).
- Computer plus laptop is ideal for clinical courses and on-campus sessions.
- For home: 384K minimum download/upload speed; a business connection best for quality. If using satellite or wireless – connection delays may be a problem and you are expected to find a site near your home to make connection for classes.
- For work: firewalls need to be evaluated, conducive location when at work – not interfering with work.
- Quality – testing (initial, and 30 minutes before classes and as needed)
- Logitech camera (webcam)
- Headset with microphone or speakers and microphone.
- Windows XP or newer, with 1GB RAM, 80GB Hard Drive, 2.0Ghz or better processor (Core 2 Duo -Dual Core preferred).
- Microsoft Office – latest version (to purchase)
- Endnote (to purchase)
- E-mail capabilities
- Functional Anti-Virus Software (example: Norton-Symantec/McAfee) (software)

## Career Preparation

The **DNP program** prepares nurses to develop clinical programs based on the latest evidence. The student will choose an area of study (Adult or Pediatric CNS, FNP, PNP, or FMHNP) on which to focus their clinical practice. Successful completion of the program prepares nurses for an advanced clinical practice in primary care, hospital and community settings as well as leadership roles in practice settings and clinical faculty positions.

**Note:** Prospective graduate students must apply to *both* the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and application details by selecting the degree program of interest in the left navigation column.

## Nursing

The school offers a baccalaureate program that prepares students for the general practice of nursing, a master's degree program that prepares advanced-practice nurses and a doctoral degree program. The continuing education program serves practicing nurses throughout the state to update and increase nursing knowledge and skills.

The graduate of the baccalaureate program is a generalist in the practice of nursing, able to design, implement and evaluate nursing systems for individuals, families and small groups. As a generalist, the graduate uses a general concept of nursing as a framework for integrating and organizing specific knowledge in nursing, the sciences and the humanities. Graduates begin their professional careers with a focused nursing perspective and, along with other professional health providers, assume responsibility for meeting the health needs of our society.

### Faculty

**Professor** J. Armer\*\*, V. S. Conn\*\*, L. H. Ganong\*\*, J. Miller, M. J. Rantz\*\*

**Associate Professor** G. Alexander\*\*, M. A. Aud\*\*, M. Enriquez\*\*, D. Finfgeld\*\*, R. A. Johnson\*\*, R. W. McDaniel\*, P. Schnitzer\*\*, D. D. Wipke-Tevis\*\*

**Assistant Professor** T. Bloom\*\*, K. Lane\*\*, L. Phillips\*\*, L. Popejoy\*\*, A. Vogelsmeier\*\*

**Associate Teaching Professor** J. E. Bostick\*, S. Farrah, D. A. Gayer\*, T. Rupp\*\*

**Assistant Teaching Professor** C. Bausler\*, L. Kuensting\*, K. Metcalf-Wilson\*, G. M. Oliver\*, D. Pennington\*

**Instructor of Nursing** V. Bader, L. Chronister, K. Ellis, P. Evans-Smith, L. Frey, G. Gregory, C. Grider, B. M. Hanson, A. G. Heine, P. Mascendero, D. L. Mendenhall, G. Nickell, D. C. Otto

**Adjunct Associate Professor** C. Brooks, C. Wakefield

**Adjunct Assistant Professor** S. Brier\*, S. Ulbrich

**Adjunct Instructor** L. Phillips, S. Revelle

**Teaching Professor** L. Miller\*

**Associate Research Professor** B. Wakefield\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

- Department Level Requirements (p. 583)
- BSN in Nursing (p. 584)

### Academic Regulations

#### Credit by Examination

RN to BSN and Accelerated BSN students may earn advanced-standing credit in some courses by satisfactorily completing examinations. Those who elect not to take the examinations or who fail to achieve satisfactory results are required to enroll in the courses. The cumulative grade point average is not affected by examination results. A student who has a record of enrollment in a support course with a grade lower than C is not

eligible later for credit on the basis of an examination covering the same subject.

The student may acquire advanced standing by taking subject CLEP examinations in university general education courses and required support courses. If no CLEP examination is offered, department examinations may be available. More information on CLEP examinations is available through MU Testing Services.

### Distance Education Courses

Certain courses offered by the Mizzou Online (self-paced) may be applied toward degree requirements. Courses such as literature, advanced psychology or sociology may be taken through independent study. Students should not expect to begin nor continue work on independent study courses during the regular semester except by special permission of the associate dean and then only when carrying less than a full course load in residence.

### Progression Criteria

#### Pre-nursing Years

- Satisfactory academic standing requires a minimum semester GPA of 2.0 and a cumulative GPA at or above the standards listed below:

Class	Semester	Credits	GPA
Freshman	1st semester	1-15 credits	2.8
Freshman	2nd semester	16-30 credits	3.0
Sophomore	3rd semester	31-45 credits	3.0
Sophomore	4th semester	46-60 credits	3.0

- A grade of C or better is required for anatomy, biology, chemistry, ENGLISH 1000, human development, microbiology, nutrition, physiology, nursing courses and Writing Intensive courses. A grade of "C-" or better is required in algebra or statistics. A grade of "F" is unacceptable for any course.
- Students may repeat a course in which an unsatisfactory grade was earned. If less than a C is earned on repetition of a course, students are ineligible to continue enrollment in the School of Nursing.
- Students who are in the traditional BSN option and withdraw in good standing for any reason must contact the Associate Dean for readmission.

#### Clinical Nursing Years

- Progression into the next semester's nursing courses is contingent on the completion, with a grade of C or better, of all of the previous semester's courses.
- A satisfactory academic standing for clinical students is a minimum semester GPA and cumulative GPA of 2.0.
- A grade of C or better is required for all nursing courses. One repetition of a course is permitted, but requires ap-approval of SAP committee. Students who earn less than a C on repetition of a nursing course are ineligible to continue enrollment in the School of Nursing.
- Students in the clinical nursing phase who withdraw in good standing for any reason must contact the Associate Dean for readmission.

### Probation and Academic Dismissal

The faculty of the School of Nursing has established criteria governing nursing probation and dismissal.

## Pre-nursing Years

- Students who do not meet the requirements set forth in the progression criteria are placed on academic probation. They must attain the cumulative grade point average required for their classification, as outlined previously, within two semesters or they are ineligible to re-enroll in the School of Nursing, and must transfer divisions.
- A student whose semester GPA falls below 1.0 is ineligible to re-enroll at MU for the period of one year.

## Clinical Nursing Years

- A student who does not meet the requirements set forth in progression criteria is placed on academic probation.
- A student on academic probation must obtain a cumulative GPA of 2.0 within two semesters or is ineligible to re-enroll in the School of Nursing.
- Students who have been dismissed may reapply through the established admissions procedure for all students and petition the Faculty Assembly Student Admissions and Progression Committee. Students who are readmitted are guided by the rules in operation for the class they join.
- A student in the clinical nursing phase who has been dismissed from the School of Nursing for a second time may not reapply for admission.

## Graduate

Sinclair School of Nursing  
S235 Sinclair School of Nursing Building  
573-882-0277  
<http://nursing.missouri.edu/>

- MS in Nursing (p. 585)
- PhD in Nursing (p. 587)
- DNP in Nursing Practice (p. 586)

## About the Sinclair School of Nursing

Nursing was an integral part of the Parker Memorial Hospital Training School, which served as the university's first hospital in 1901. Although a nursing program was not officially established until 1920 within the School of Medicine, MU graduated its first nursing class in 1904. Sixteen years later, the Curators approved a Graduate Nursing designation. Today, the Sinclair School of Nursing provides a rich and rewarding learning environment for our students. Our faculty includes knowledgeable and skillful teachers, respected scholars and researchers in the nursing profession, and experienced, caring practitioners. The master's program is accredited by the Commission on Collegiate Nursing Education, One Dupont Circle, NW, Suite 530, Washington, DC 20036, (202) 887-6791.

## Facilities and Resources

Graduate students in the School of Nursing have access to all campus libraries and the various services they provide. The School of Nursing building is adjacent to University Hospital and Clinics and MU Psychiatric Center Women and Children's Hospital and Ellis Fischel Cancer Center are located nearby. A variety of learning experiences also are available at other hospital and health and social service agencies in and around Columbia.

## Career Opportunities

Nursing is a professional career for those who would like to combine the following words in any number of ways: Servant leadership, challenge, advanced nursing skills, caring, science, and meaningful work. Graduates of our program work in a variety of settings - from hospital inpatient units and hospital based clinics, to community health centers, private practices, and schools, to areas of research and teaching.

## Funding

Financial assistance is available as scholarships, fellowships, assistantships and traineeships.

## Undergraduate

## Department Level Requirements - Nursing

### Additional Requirements

Students in the clinical phase of the degree requirements must be prepared to provide their own transportation to clinical agencies. In addition, they must meet the following requirements:

- Valid CPR certificate
- yearly TB tests
- Hepatitis B series
- School of Nursing medical form showing current immunizations
- Negative drug screen
- Criminal background check

### Practicums

Clinical practicums (patient/client care) are an integral part of the curriculum. Students have the opportunity to practice in a variety of health care and related agencies, including:

- University of Missouri Health Care
- Boone Hospital Center
- Truman Veterans Hospital
- Fulton State Hospital
- Mid-Missouri Mental health Center
- Multiple county and city health departments
- Long-term care facilities
- Day-care centers
- Schools (K-12)

## Licensure by the Missouri State Board of Nursing

On receipt of the Bachelor of Science in Nursing degree, students may be eligible to take the NCLEX examination for licensure as registered nurses. The Missouri State Board of Nursing grants a license to practice to persons who meet the policies and regulations contained within the Nursing Practice Act, Chapter 335.011 to 335.096.

## BSN in Nursing

### Major Core Requirements - Nursing (BSN)

The completion of all requirements for graduation is the responsibility of the student. The Bachelor of Science in Nursing (BSN) is granted to candidates who have satisfactorily completed all of the following requirements:

- Completion of all foundational and clinical nursing courses
- Minimum cumulative GPA of 2.0
- No more than 30 credits through independent study or extension courses
- Completion of all University graduation requirements (p. 17), including University general education requirements (p. 18)
- Completion of all Department Level Requirements (p. 583)

#### Pre-Nursing requirements

Curriculum is based on prerequisite of one year of high school biology with lab and grades of C or better. The student must meet all University general education requirements.

#### General courses

ENGLISH 1000	Exposition and Argumentation	3
HIST: American History or American Government		3
Humanities/Fine Arts **		9-13
Upper-level behavioral science		3
STAT 1200	Introductory Statistical Reasoning (MP)	3
or ESC_PS 4170	Introduction to Applied Statistics	
MATH 1100	College Algebra *	3

#### Foundation courses

BIO_SC 1010	General Principles and Concepts of Biology	3-5
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
CHEM 1100	Atoms and Molecules with Lab	2-3
or CHEM 1000	Introductory Chemistry	
PTH_AS 2201	Human Anatomy Lecture	5
& PTH_AS 2203	and Human Anatomy Laboratory	
MPP 3202	Elements of Physiology	5
MICROB 2800	Microbiology for Nursing and Health Professions	4
or MICROB 3200	Medical Microbiology and Immunology	
H_D_FS 2400	Principles of Human Development	4
NUTR_S 2380	Diet Therapy for Health Professionals	3
PSYCH 1000	General Psychology	3
SOCIOL 1000	Introduction to Sociology	3
or RU_SOC 1000	Rural Sociology	
NURSE 2000	Nursing as a Profession	3
NURSE 2100	Psychosocial and Communication Issues in Nursing	2

#### Clinical nursing requirements - professional courses

NURSE 3170	Nursing Skills, Technologies, and Simulation	4
NURSE 3200	Pathophysiology and Therapeutics	4
NURSE 3270	Foundations of Nursing: Physical Assessment and the Nursing Process	6
NURSE 3300	Pharmacology and Nursing Implications	4
NURSE 3470	Mental Health Nursing	4

NURSE 3670	Nursing of Adults I	6
NURSE 3870	Gerontological Nursing Care	3
NURSE 3900	Introduction to Nursing Science	3
NURSE 4200	Nursing Ethics and Law	3-4
NURSE 4270	Nursing of Children	5
NURSE 4300	Nursing Issues/Leadership and Management	2
NURSE 4470	Nursing of Women and Newborns	5
NURSE 4870	Nursing of Adults II	7
NURSE 4970	Nursing in Communities	5
Total Credits		122-130

\* Denotes University General Education Requirements

^ Denotes Degree Program Requirements

\*\* If taking a Foreign Language for humanities credit, you will complete the sequence of foreign language courses that could total 13 hours.

Admission to the nursing clinical major is a requirement to take these courses.

### Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	Credits	Spring	Credits
BIO_SC 1010 or 1500 <sup>^</sup>	3-5	Major Science	4-5
CHEM 1100 or 1000 <sup>^</sup>	2-3	ENGLISH 1000 <sup>*</sup>	3
HIST 1100, 1100H, 1200, 1200H, POL_SC 1100, or POL_SC 1100H <sup>*</sup>	3	PSYCH 1000 <sup>^</sup>	3
MATH 1100 <sup>*</sup>	3	STAT 1200 or ESC_PS 4170 <sup>^</sup>	3
SOCIOL 1000	3	Humanities/Fine Arts Course <sup>*</sup>	3
	14-17		16-17
Second Year			
Fall	Credits	Spring	Credits
Major Science	5	Major Science	5
NURSE 2000 <sup>^</sup>	3	NUTR_S 2380 <sup>^</sup>	3
SOCIOL 1000 <sup>^</sup>	3	NURSE 2100 <sup>^</sup>	2
H_D_FS 2400 <sup>^</sup>	4	Behavioral/Science Elective 2000 level <sup>*</sup>	3
Humanities/Fine Art	3	Humanities/Fine Arts Course	3
	18		16
Third Year			
Fall	Credits	Spring	Credits
NURSE 3170 <sup>^</sup>	4	NURSE 3470 <sup>^</sup>	4
NURSE 3200 <sup>^</sup>	4	NURSE 3670 <sup>^</sup>	6
NURSE 3270 <sup>^</sup>	6	NURSE 3870 <sup>^</sup>	3
NURSE 3300 <sup>^</sup>	4	NURSE 3900 <sup>^</sup>	3
	18		16



Fourth Year			
Fall	Credits	Spring	Credits
NURSE 4270 <sup>^</sup>	5	NURSE 4870 <sup>^</sup>	7
NURSE 4200 <sup>^</sup>	3-4	NURSE 4970 <sup>^</sup>	5
NURSE 4300	2		
NURSE 4470	5		
	<b>15-16</b>		<b>12</b>
Total Credits: 125-130			

\* Denotes University General Education Requirements

<sup>^</sup> Denotes Degree Program Requirements

\*\* If taking a Foreign Language for humanities credit, you will complete the sequence of foreign language courses that could total 13 hours.

**NOTE:** Third Year and Fourth Year curriculum subject to change.

## Graduate

### MS in Nursing

#### Admission Contact Information

<http://nursing.missouri.edu/>  
 S235 School of Nursing  
 Columbia, MO 65211  
 573-882-0200

The distance mediated master's of science (MS(N)) program prepares graduates to fulfill and excel in advanced nursing practice roles requiring advanced skills in nursing education and/or leadership in delivery of health care to individuals, communities and populations.

#### Application Deadlines

Deadline for Summer entrance: February 1

#### Admission Criteria

To be considered for admission to the Sinclair School of Nursing's master's degree program, students must meet the following requirements:

- A degree from a nationally accredited baccalaureate nursing program.
- A minimum GPA of 3.3 for the last 60 credit hours of the baccalaureate program.
- Current licensure as a registered nurse.
- Graduate Record Examination (GRE) scores, which may be waived for any student with a GPA of 3.3 higher (4.0 grading scale), based on the last 60 hours of undergraduate coursework.
- Successful completion of a graduate-level statistics course (ESC\_PS 7170 or STAT 7020).
- Two reference forms.
- Resume or curriculum vitae.
- A personal statement of your professional goals and how this program will help you achieve them.
- List of Possible Clinical Preceptors/Internship Mentors.

**\* Due to higher education regulation changes, the University of Missouri is unable to accept applications for admission to online**

programs from students residing in Massachusetts. You may find more information at this link: <http://online.missouri.edu/about/stateauthorization.aspx>.

### International Student Admission for Nursing MS

- All international admissions are initially the responsibility of the MU Coordinator of International Student Programs. The Student Admissions and Progression Committee of the School of Nursing may not act upon any international application for admission until the applicant has been cleared through the office.
- Non-native English speaking applicants need documentation of English-language proficiency, demonstrated through a satisfactory Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score within the last two years.
- Minimum TOEFL scores\*:

Internet-based test (iBT)	Paper-based test (PBT)
80*	550**

\* No score lower than 15 in any section.

\*\* No score lower than 50 in any section.

- Minimum total academic IELTS score\* for graduate admission: 7.0

Item	Score
Listening	
Reading	
Writing	
Speaking	
OVERALL Score*	6.5

\* Minimum bandwidth 6.0

- see also <http://gradschool.missouri.edu/admissions/eligibility-process/international.php>
- International students must submit a photocopy of a current RN license from their home country with their Masters application.
- International nurses must obtain a Missouri RN license prior to beginning coursework.

#### Technology requirements

To complete online courses, you will need access to a computer with a modern web browser, a working Internet connection, word processing software, and disk space to save your work. Your browser should support graphics, run JavaScript and accept cookies. Portions of the courses may require Adobe Flash Player.

To ensure that your computer is set up and ready to begin your online course, it is recommended that you review the Mizzou Online Computer Requirements (<http://online.missouri.edu/prepare/computer.aspx>).

#### Areas of Study for the MS program

Students in the Master of Science program obtain advanced preparation in one of two areas:

- Nurse Educator (<http://nursing.missouri.edu/academics/master-of-science/areas/nurse-educator.php>)

- Leadership in Nursing and Healthcare Systems (<http://nursing.missouri.edu/academics/master-of-science/areas/leadership.php>)

## Master of Science in Nursing Progression Requirements

The University of Missouri requires a minimum of 30 credit hours beyond the baccalaureate degree for a master's degree. The MU Sinclair School of Nursing requirements vary from 37 to 41 credit hours depending on the area of study. For satisfactory progress, students must maintain a GPA of 3.0 and be continually enrolled during fall and spring semesters until completion of the degree.

## Thesis or Master's Exam

Each candidate must pass a final examination to demonstrate mastery of the fundamental principles of the work included in the course of study offered for the degree. This requirement may be fulfilled by completion of a Master's Exam (MS exam) or thesis. The MS exam consists of a paper that should reflect the graduate student's grasp and synthesis of the clinical and theoretical knowledge gained in the course of study.

To satisfy requirements for the MS, a student must:

- Complete an approved program with a cumulative GPA of 3.0
- Successfully defend a written thesis or complete the MS Exam
- Complete the program within a five-year period

## DNP in Nursing Practice

### Admission Contact Information

S246 School of Nursing  
Columbia, MO 65211  
573- 882-0200  
E-mail: [Nursing@missouri.edu](mailto:Nursing@missouri.edu)  
<http://nursing.missouri.edu>

The MU Sinclair School of Nursing's distance mediated Doctor in Nursing Practice (DNP) program began in the Summer of 2010. DNP students are required to spend one week on campus the first summer of enrollment and during their last semester of enrollment. All clinical courses will have required on campus days that range from one to four days during the semester (see required On Campus dates (<http://nursing.missouri.edu/academics/master-of-science/on-campus-dates.php>)).

## Career Preparation

The DNP program at Mizzou prepares leaders in the advanced nursing practice roles of Pediatric & Adult-Gerontology Clinical Nurse Specialist (<http://nursing.missouri.edu/academics/master-of-science/areas/cns.php>), (<http://nursing.missouri.edu/academics/master-of-science/areas/cns.php>) Family Nurse Practitioner (<http://nursing.missouri.edu/academics/master-of-science/areas/family-nurse-practitioner.php>), Pediatric Nurse Practitioner (<http://nursing.missouri.edu/academics/master-of-science/areas/pediatric-np.php>), and Family Psychiatric & Mental Health Nurse Practitioner (<http://nursing.missouri.edu/academics/master-of-science/areas/mental-health-fmhnpp.php>). Our program strengths include a strong clinical focus and a well-developed trajectory for the development of clinical scholarship. Unique aspects of our program are a focus on rural and underserved populations and the opportunity for students to select electives in family dynamics, financial management, nursing education, or symptom management. Successful completion of the program prepares

nurses for an advanced clinical practice in primary care, hospital and community settings as well as leadership roles in practice settings and clinical faculty positions.

## Application Deadlines

Application Date: December 1

## Admission Criteria for the Doctor of Nursing Practice

- Completed application for admission to the MU Graduate School at the University of Missouri (Apply Yourself).
- Completed application for admission to the DNP program at the MU Sinclair School of Nursing (Apply Yourself).
- Submission of all official transcripts documenting a baccalaureate or master degree in Nursing from a program accredited by a national organization responsible for nursing accreditation (i.e. National League for Nursing Accrediting Commission (NLNAC) or Commission on Collegiate Nursing Education (CCNE))
- A grade point average (GPA) of 3.3 on a 4.0 scale based on the last 60 hours of undergraduate nursing course work for applicants with less than a master's degree.
- A cumulative GPA of 3.5 on a 4.0 scale for applicants with a master's degree in nursing.
- Applicants who do not meet the minimum GPA requirements must submit acceptable scores on the Graduate Record Exam (GRE) and the exam must have been taken within the last five years (Recommended minimum scores: If the GRE was taken prior to August 1, 2011: Verbal 500; Quantitative 500; Writing 4.0. If the GRE was taken on or after August 1, 2011: Verbal 153; Quantitative 144; Writing 4.0.).
- Successful completion of a graduate level statistic course (eg. STAT 7020, ESC\_PS 7170) within 5 years.
- Submission of copies of current, unencumbered Registered Nurse license(s).
- Submission of copies of all advanced practice nursing certification and/or credentialing/recognition documents for applicants with a master's degree.
- Verification of faculty supervised preceptor clinical hours in your Advanced practice program (<http://nursing.missouri.edu/apply/applications/clinical-verification-for-dnp.pdf>)
- Submission of three (3) professional recommendations supporting the applicant's potential success in the DNP program (using form on the Apply Yourself website).
- Submission of curriculum vitae using the official MU Sinclair School of Nursing format (curriculum vitae guidelines).
- Submission of a three- to five-page essay describing your professional goals and how participation in the DNP program will enhance these goals.
- Documentation of English-language proficiency (of non-native English speaking applicants), demonstrated through a satisfactory Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score within the last two years.
- Successful interview.
- For more information, visit the University's Admission web pages.

**\* Due to higher education regulation changes, the University of Missouri is unable to accept applications for admission to online**

programs from students residing in Massachusetts. You may find more information at this link: <http://online.missouri.edu/about/stateauthorization.aspx>.

## Technology Requirements

To complete distance-mediated/online courses, you will need access to a computer with a modern web browser, a working high speed internet connection, Microsoft office, Endnote, SPSS and Antiviral software. Software may be purchased from MU DoIT (<http://doit.missouri.edu/software>) very inexpensively. You may want an extra external hard drive or cloud technology to save your work. Your browser should support graphics, run JavaScript and accept cookies. Portions of the courses may require Adobe Flash Player. A headset with a good microphone is used for online synchronous discussions.

To ensure that your computer is set up and ready to begin your online course, it is recommended that you refer to the Mizzou Online Computer Requirements webpage.

## DNP Progression Requirements

The DNP in nursing requires a minimum of 74.5 credits beyond the baccalaureate degree. Of the 74.5 hours, 36.5 credits must be completed at the University of Missouri.

Ultimately, the student, in collaboration with their DNP residency committee, determines the student's plan of study and total credit hours necessary to adequately prepare the student to successfully complete their DNP residency project.

Upon admittance to the program, the following must be completed by the student and documentation of these items must be submitted before registering for coursework:

- Current required immunizations
- Satisfactory criminal background check
- Satisfactory drug screen
- Current CPR certification
- Proof of undisciplined nursing licensure

For more information contact:

Graduate Admissions  
 S246 Sinclair School of Nursing  
 University of Missouri  
 Columbia, MO 65211  
 Phone: (573) 882-0200  
 E-mail: [Nursing@missouri.edu](mailto:Nursing@missouri.edu)

## PhD in Nursing

### Admission Contact Information

S245 School of Nursing  
 Columbia, MO 65211  
 573-8824-4705  
 Email: [nursing@missouri.edu](mailto:nursing@missouri.edu)  
<http://nursing.missouri.edu>

The MU Sinclair School of Nursing (MUSSON) offers a challenging and yet enriching PhD program with two options.

- **Distance-Mediated PhD Program Option:** PhD coursework may be accessed online through the Distance-Mediated PhD program option by learning over the World Wide Web using the Blackboard learning

platform. This option also requires a 5 Day On Campus visit (held on the Columbia campus) the first summer of enrollment and 3-4 Day On Campus Intensives every April until coursework is completed (see PhD On Campus Dates (<http://nursing.missouri.edu/academics/phd/on-campus-dates.php>)). Because the program is distance-mediated, students are responsible for obtaining the required technology for successful participation in synchronous distance-mediated courses (see Computer Requirements (<http://online.missouri.edu/prepare/computer.aspx>));

- **International Residential PhD Option:** Through the International Residential PhD option, international students attend the MU campus hybrid classes in Columbia, Missouri. The International Residential PhD student attends the hybrid classes in person, while the Distance-Mediated student cohort participates electronically. International Residential PhD students may also enroll in traditional residential course offerings through the MU Sinclair School of Nursing and the rest of the MU campus. Students in the International Residential PhD option must enroll in 4 credits during their first summer and maintain full-time status by enrolling in 9 credits each fall and spring term thereafter. Of the 9 credits each term, at least 6 credits must be either traditional face-to-face or hybrid coursework in order to qualify for and retain the F-1 student visa status. The remaining 3 credits each term may be taken 100% on-line.

The PhD curriculum and program requirements are the same whether you choose the Distance-Mediated PhD option or the International Residential PhD option. Only the method of course delivery varies.

## Career Preparation

The PhD program prepares scholars to conduct original research, thereby; advancing the body of knowledge that guides nursing practice and contributes to improving population health and healthcare systems. Successful completion of the program prepares graduates for college or university faculty positions as well as leadership roles in nursing, health care, industry, and governmental agencies.

January 1 is the application deadline.

## International Applicants to the PhD Program

All international admissions are initially the responsibility of the MU Coordinator of International Student Programs. The PhD Program Committee of the School of Nursing may not act upon any international application for admission until the applicant has been cleared through the office.

- Non-native English speaking applicants need documentation of English-language proficiency, demonstrated through a satisfactory Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score within the last two years.
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80*	550**

\* No score lower than 15 in any section.

\*\* No score lower than 50 in any section.

- Minimum total academic IELTS score\* for graduate admission:

Item	Score
Listening	
Reading	
Writing	
Speaking	
OVERALL Score*	6.5

\* Minimum bandwidth 6.0

- See also <http://gradschool.missouri.edu/admissions/eligibility-process/international.php>
- In addition to the TOEFL, both the Test of Written English (TWE) maybe be required.
- Depending upon English-language proficiency, one or two semesters of English Language Support Program coursework may be required.
- International students must submit a photocopy of a current RN license from their home country with their PhD application, if applicable to their program of study.

## Admission Criteria for the PhD in Nursing

The minimum criteria for admission to the PhD in nursing include:

- Completed application for admission to the MU Graduate School at the University of Missouri.
- Completed application for admission to the PhD program at the MU Sinclair School of Nursing.
- **BS to PhD Applicants:** BSN degree from NLNAC or AACN-accredited school- or equivalent for non-nurse applicants; 3.2 minimum GPA (4.0)
- **MS to PhD Applicants:** Master's degree from NLNAC or CCNE-accredited school - or equivalent for non-nurse applicants; minimum 3.5 GPA (4.0)
- Submission of all official transcripts documenting a baccalaureate or master's degree
- Acceptable GRE scores within 5 years of application (Recommended minimum scores: If the GRE was taken prior to August 1, 2011: Verbal 500; Quantitative 500; Writing 4.0. If the GRE was taken on or after August 1, 2011: Verbal 153; Quantitative 144; Writing 4.0.);
- Successful completion of a graduate level statistics course within 5 years of application (e.g., or ESC\_PS 7170);
- Submission of three (3) professional recommendations supporting the applicant's potential success in the PhD program.
- Submission of curriculum vitae
- 3 acceptable written recommendations (using form on the ApplyYourself website)
- Acceptable original essay that includes research and professional goals and identification of an appropriate MU Sinclair School of Nursing research faculty mentor.
- Documentation of English-language proficiency (of non-native English speaking applicants), demonstrated through a satisfactory Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score within the last two years.
- Successful interview.

Each qualified applicant will be invited to interview with members of the PhD Program committee and potential research mentors. Admission decisions are made by the PhD Program Committee with input from the applicant's potential research mentor(s). Applicants for whom an

appropriate research mentor is not available will not be accepted for admission.

**\* Due to higher education regulation changes, the University of Missouri is unable to accept applications for admission to online programs from students residing in Massachusetts. You may find more information at this link: <http://online.missouri.edu/about/stateauthorization.aspx>.**

## Technology Requirements

To complete online courses, you will need access to a computer with a modern web browser, a working internet connection, word processing software, and disk space to save your work. Your browser should support graphics, run JavaScript and accept cookies. Portions of the courses may require Adobe Flash Player.

To ensure that your computer is set up and ready to begin your online course, it is recommended that you review the Mizzou Online Computer Requirements (<http://online.missouri.edu/prepare/computer.aspx>).

## Doctor of Philosophy in Curricula

There are two curricular options (<http://nursing.missouri.edu/academics/phd/curriculum.php>): (a) post-baccalaureate (BS-PhD) and (b) post-master's (MS-PhD). For both options, the doctoral curriculum is divided into three categories:

- specialty content areas (theory analysis and development, specialty area applied sciences, substantive science seminars, and education courses, as well as teaching practicum experiences)
- research and inquiry (philosophy of science, statistics and measurement, qualitative and quantitative methods courses, research practicum experiences as well as dissertation research)
- collateral area (coursework taken outside the School of Nursing that helps to support the dissertation research topic).

## Substantive Areas of Science

The Substantive Areas of Science are based upon MUSSON PhD faculty research interests and expertise. Each PhD student selects one Substantive area of science upon which to focus. Choices are: Innovation Science; Prevention and Treatment of Trauma Across the Lifespan; Managing Symptoms and Promoting Healthy Behaviors.

## Innovation Science

Content and research interests of students selecting substantive area might include innovations in:

- Safety
- Quality Improvement
- Assistive Technology
- Healthcare Systems
- Human Factors
- Care Coordination

## Prevention and Treatment of Trauma Across the Lifespan

Content and research interests of students selecting this substantive area might include:

- Social Determinants of Health
- Intimate Partner Violence

- Child Abuse and Neglect
- High Risk Populations
- Substance Abuse and Treatment

## **Managing Symptoms and Promoting Healthy Behaviors**

Content and research interests of students selecting this substantive area might include:

- Adherence to health promoting behaviors
- Optimizing physiologic, psychosocial & physical function
- Coping with acute or chronic illness
- Managing disability or disabling conditions
- Physical and emotional effects of cancer survivorship

## **Partnerships**

The PhD Program collaborates with the other UM system schools of nursing. Faculty may serve on dissertation committees for students across the campuses as appropriate. One benefit of this collaboration is that students in one program may take courses offered by the other programs through Mizzou Online or by using the UM System Visiting Graduate Student Program (<http://gradschool.missouri.edu/admissions/eligibility-process/um-visiting-student-programs.php>).

A number of Graduate Certificate programs (<http://online.missouri.edu/degreeprograms/degrees.aspx>) are offered in a distance mediated format by other MU Departments which will allow the students to complete their collateral area of interest. In addition to completing the collateral requirement, the students will obtain a Graduate Certificate documenting their expertise within a specific area.

Additional information about the MU Sinclair School of Nursing PhD program including course descriptions, plans of study, student responsibilities, and progression requirements can be found on the School of Nursing PhD webpage (<http://nursing.missouri.edu/academics/phd>).

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## Additional Minors and Certificates - Nursing

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Undergraduate

Graduate

- Certificate in Adult Health Clinical Nurse Specialist (p. 590)
- Certificate in Family Mental Health Nurse Practitioner (p. 590)
- Certificate in Mental Health Nurse Practitioner (p. 590)
- Certificate of Pediatric Clinical Nurse Specialist (p. 590)

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## Graduate

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### Graduate Certificate in Adult Health Clinical Nurse Specialist

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The Post-Master's Certificate Program at the MU Sinclair School of Nursing enables nurses with a master's degree to expand their knowledge and scope of practice in one or more specialty areas. Adult Health CNSs are clinical experts in the diagnosis and treatment of illness, and delivery of evidence-based nursing interventions for adults and older adults across the care continuum from wellness through acute care. Additionally, CNSs are experts in executing delegated medical regimes associated with the diagnosis and treatment of disease for a specialty population. A CNS may be unit-based or have agency-wide responsibilities for a patient population. The CNS has a unique APRN role to integrate care across the continuum and through three spheres of influence: direct patient/client care, nurses & nursing practice, and systems and organizations (APRN Joint Dialogue Group, 2008). Thus, in addition to direct patient/client care, key elements of CNS practice are to create environments through mentoring and system changes that empower nurses to develop caring, evidence-based practices. Accordingly, CNSs are involved in developing staff education as well as safety and quality improvement activities. Certificate is available via online learning.

Certificate web site: <http://www.nursing.missouri.edu/academics/post-masters-certificate/index.php>

For more information about certificate, contact:  
Office of Student Affairs  
Sinclair School of Nursing  
S235 School of Nursing  
Columbia, MO 65211  
email: [nursing@missouri.edu](mailto:nursing@missouri.edu)  
phone: 573-882-0277

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### Graduate Certificate in Family Mental Health Nurse Practitioner

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Advanced practice nurses are traditionally prepared at the graduate level in a specific clinical area. The specialty area may be identified in terms of population (e.g. pediatrics or adults), and/or type of problem (e.g. mental health). The advanced practice nurse is directly accountable for clinical judgments which includes independent and interdependent decision making. Holders of this certificate provide primary mental health care at an advanced level to individuals of all ages and families. Includes

differential diagnosis and management of psychiatric & mental health disorders, medication management, and psychotherapeutic interventions. Certificate is available via online learning.

Certificate web site: <http://www.nursing.missouri.edu/academics/post-masters-certificate/index.php>

For information about certificate, contact:  
Office of Student Affairs  
Sinclair School of Nursing  
S235 School of Nursing  
Columbia, MO 65211  
email: [nursing@missouri.edu](mailto:nursing@missouri.edu)  
phone: 573-882-0277

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### Graduate Certificate in Mental Health Nurse Practitioner

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This option is no longer available.

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### Graduate Certificate of Pediatric Clinical Nurse Specialist

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The Post-Master's Certificate Program at the MU Sinclair School of Nursing enables nurses with a master's degree to expand their knowledge and scope of practice in one or more specialty areas. Pediatric CNSs are clinical experts in the diagnosis and treatment of illness, and delivery of evidence-based nursing interventions for children, adolescents and their families across the care continuum from wellness through acute care. Additionally, CNSs are experts in executing delegated medical regimes associated with the diagnosis and treatment of disease for a specialty population. A CNS may be unit-based or have agency-wide responsibilities for a patient population. The CNS has a unique APRN role to integrate care across the continuum and through three spheres of influence: direct patient/client care, nurses & nursing practice, and systems and organizations (APRN Joint Dialogue Group, 2008). Thus, in addition to direct patient/client care, key elements of CNS practice are to create environments through mentoring and system changes that empower nurses to develop caring, evidence-based practices. Accordingly, CNSs are involved in developing staff education as well as safety and quality improvement activities. Certificate is available via online learning.

Certificate web site: <http://www.nursing.missouri.edu/academics/post-masters-certificate/index.php>

For information about certificate, contact:  
Office of Student Affairs  
Sinclair School of Nursing  
S235 School of Nursing  
Columbia, MO 65211  
email: [nursing@missouri.edu](mailto:nursing@missouri.edu)  
phone: 573-882-0277

## Harry S Truman School of Public Affairs

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application details by selecting the degree program of interest in the left navigation column.

Public Affairs Graduate Programs  
Harry S Truman School of Public Affairs  
101 Middlebush Hall, Columbia, Missouri 65211  
573-884-1656  
Email [truman@missouri.edu](mailto:truman@missouri.edu)  
<http://www.truman.missouri.edu>

**Dean:** Bart Wechsler

Established by the University of Missouri Board of Curators in May, 2001 the Harry S Truman School of Public Affairs is dedicated to the advancement of study and practice of governance in the state, nation and world. The School offers graduate degrees and certificates in the theory and practice of public and nonprofit management, public policy, and organizational change.

In keeping with Truman's legacy, TSPA has numerous international linkages. Truman School students and alumni have served as Peace Corps volunteers, United Nations interns, in the US State Department, other national consulates or embassies in Washington, and international non-government organizations (NGOs) such as the Red Cross/Red Crescent. Truman School faculty members participate in international projects in Europe, Asia, Africa, and South America. Scholars from Europe, Asia, and other parts of the world regularly visit the Truman School, helping to inform curriculum and classroom discussions.

### Undergraduate

The School of Public Affairs currently offers academic pursuits solely at the graduate level.

### Graduate

The Harry S Truman School of Public Affairs offers master's and doctoral degrees in the theory and practice of public and nonprofit management, public policy, and organizational change. MPA students are prepared for careers in a new public service that spans government, nonprofit, and private sectors. PhD students are trained for careers in academic and research institutions.

#### Graduate Degrees

Master of Public Affairs (MPA)  
Doctor of Philosophy in Public Affairs (PhD)

#### Cooperative Dual Degrees

Master of Public Affairs and Juris Doctorate  
Master of Public Affairs and Master of Public Health

#### Graduate Certificates:

Grantsmanship Certificate  
Nonprofit Management Graduate Certificate  
Organizational Change Graduate Certificate  
Public Management Graduate Certificate  
Science and Public Policy Certificate

**Note:** Prospective graduate students must apply to both the degree program of interest and to the MU Graduate School. In most cases, the entire application process may be completed online. Find admission and

## Public Affairs

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Public Affairs Graduate Programs  
Harry S Truman School of Public Affairs  
101 Middlebush Hall, Columbia, Missouri 65211  
573-884-1656  
Email [truman@missouri.edu](mailto:truman@missouri.edu)  
<http://www.truman.missouri.edu>

**Dean:** Bart Wechsler

### About the study of Public Affairs

The Harry S Truman School of Public Affairs offers master's and doctoral degrees in the theory and practice of public and nonprofit management, public policy, and organizational change. MPA students are prepared for careers in a new public service that spans government, nonprofit, and private sectors. PhD students are trained for careers in academic and research institutions.

### Faculty

**Professor** G. B. Adams\*\*, M. A. Diamond\*\*, K. Hagglund\*, T. G. Johnson\*\*, C. Menifield\*\*, M. Podgursky\*, J. Stallmann\*, B. Wechsler\*, L. Wilkins\*

**Associate Professor** C. Heflin\*\*, L. Keiser\*\*, C. L. Sampson\*, J. K. Scott\*, L. A. Zanetti\*

**Assistant Professor** I. Arteaga\*, R. Darolia\*, S. Potochnick\*

**Research Professor** B. Dabson\*

**Assistant Research Professor** C. Fulcher\*

**Assistant Teaching Professor** M. Stegmaier\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in public affairs, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

Harry S Truman School of Public Affairs  
[truman@missouri.edu](mailto:truman@missouri.edu)  
101 Middlebush Hall  
Columbia, Missouri 65211  
573-884-1656  
<http://truman.missouri.edu/>

**Dean:** Bart Wechsler

**Associate Dean for Academic Programs:** Charles Menifield

- MPA in Public Affairs (p. 592)
- PhD in Public Affairs (p. 593)

## Graduate

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### MPA in Public Affairs

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MU Truman School of Public Affairs students study with outstanding faculty, who are talented teachers as well as active, nationally recognized scholars. Policy forums, round-tables with policy makers, lectures by distinguished visiting scholars, and research symposia also enrich student learning. Small classes taught both on campus and in Jefferson City, the state's capital, make for a lively learning environment. The Truman School MPA program provides a balance of public service values, interpersonal and analytic skills, and a thorough knowledge of administrative and policy processes.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Contact the Truman School at (573) 884-1656 or <http://www.truman.missouri.edu> for details.

### Application and Admission Information

Admission to the Master of Public Affairs Program  
Ms. Nicole Harris, Assistant Program Director for Student Services  
101 Middlebush Hall, Columbia, Missouri 65211  
573-884-1656  
[Truman@missouri.edu](mailto:Truman@missouri.edu)

### Admission Criteria

Fall deadline: Priority admission and funding consideration are given to applications received by January 15. Applications submitted after January 15 will be considered, with preference going to those received by May 1. Prospective students applying after May 1 will be considered for fall admission on a case by case basis.

Spring deadline: Priority admission consideration is given to applications received by November 15.

Assistantship/Fellowship deadline: January 15

- Minimum GPA: 3.0 in last 60 hours
- Minimum TOEFL scores:
  - iBT: 80
  - CBT: 213
  - PBT: 550
- Minimum preferred GRE scores:
  - Prior to August 2012: 1000 (combined)
  - After August 2012: 300 (combined)

Admission to the MPA program is competitive and open to students holding baccalaureate degrees from accredited institutions and meeting admissions standards of the Truman School of Public Affairs and the Graduate School.

### Required Application Materials

*To the Graduate School:*



- All required Graduate School documents

*To the Truman School MPA Program:*

- 3 letters of recommendation
- GRE score report (GRE alternatives accepted: LSAT, GMAT and MCAT scores will be considered)
- Resume
- Statement of interest

## Degree Requirements

Consisting of 45 hours of graduate work, the MPA program includes a core (27 hours), an area of specialization (15 hours) and an internship (3 hours). The areas of specialization are Nonprofit and Public Management, and Public Policy

Students with significant public service experience may have some courses waived, making the MPA program 33 hours for them. The MPA's Mid-career option is available to students with 3-5 years of public service experience.

## Internship

During the summer after their first year in the program, students without significant public sector work experience are required to complete a public service internship. Interns apply what they have learned during the first year in the program, plus they gain practical experience that enables deeper learning during second-year classes.

## PhD in Public Affairs

PhD Contact: Dr. Guy Adams  
(573) 882-5443  
adamsgb@missouri.edu

## About the PhD Program in Public Affairs

The Harry S Truman School of Public Affairs at the University of Missouri offers an interdisciplinary PhD in Public Affairs that prepares graduates for careers in universities, colleges and applied research settings in the public, private and nonprofit sectors. Students complete core sequences in public policy and management as well as research methods, and specializations tailored to students' research interests.

## PhD Acceptance

The Harry S Truman School of Public Affairs PhD is an academic and research-oriented degree in public affairs. Applicants without previous coursework in public affairs (public management and policy) are required to complete up to 18 hours of foundation coursework.

## Acceptance Criteria

In making its decision, the PhD committee considers:

- The applicant's record of academic achievement (Applicants typically have undergraduate GPAs higher than 3.0, and graduate GPAs higher than 3.5.)
- The quality of the written statement explaining why the applicant wants to pursue the degree
- The quality of the applicant's writing sample
- Evaluations contained in letters of recommendation
- Acceptable performance on the Graduate Record Examination (GRE). Applicants typically have combined scores of 1200 or higher.

- Results of a personal interview with the applicant in person or by telephone
- Other factors bearing upon the candidate's potential for success

## Application Procedure

1. Applications for the PhD program are accepted for fall entrance only. For a prospective student's application to be complete, the Truman School must receive all required materials by January 15.
2. Applicants are required to upload application materials to the MU Graduate School Application for Admission.
3. Official transcripts must be mailed to the Graduate School and GRE/TOEFL scores directed to institution code 6875.

## Required application materials

A student's application is complete when all of the following materials have been received. The Truman School's downloadable checklist contains more information on the following required application materials:

- University of Missouri Graduate School application (application fee required)
- Statement of interest
- Curriculum vitae/Resume
- Writing sample
- Personal data sheet
- Three letters of recommendation
- Official undergraduate and graduate transcripts (must be mailed directly to the Graduate School)
- Official Graduate Record Examination (GRE) score report (must be sent by ETS)
- Official TOEFL score report (must be sent by ETS; required of applicants whose native language is not English)

## Entrance Exams

- The Graduate Record Examination (GRE) is required of all applicants.
- Applicants whose native language is not English must achieve a score of 625 (107 iBT) in the Test of English as a Foreign Language (TOEFL).
- Use the following codes to submit test scores to the Truman School:
  - University of Missouri-Columbia Institution Code: 6875
  - Truman School Department Code: 4801

## Cost of Attendance and Financial Aid

Prospective students should visit the University of Missouri Graduate School financial information and support web page for current information about tuition and fees. The University's Office of Student Financial Aid provides information about other types of aid students can obtain, including federally financed student loans. **Financial aid applications are due by January 15.**

## Additional Minors and Certificates - Public Affairs

Undergraduate

Graduate

- Certificate in Grantsmanship (p. 594)
- Certificate in Nonprofit Management (p. 594)
- Certificate in Organizational Change (p. 594)
- Certificate in Public Management (p. 595)
- Certificate in Science and Public Policy (p. 595)

## Graduate Certificate in Grantsmanship

### About the Certificate

The Truman School offers one of the few completely online grant writing certificate programs in the country, making it easy to fit classes into a busy schedule. Students will learn to write grant proposals and manage grant funded programs effectively. Learn winning grant writing techniques and proper grant management with this four-course graduate certificate in grantsmanship. As one of the few completely online certificate programs in grantsmanship in the nation, our program is well suited for a variety of audiences, including community-based professionals in nonprofit organizations, state and local government and educators in K-12 settings. Graduate and post-doctoral students and young faculty members who are seeking to become more competitive in research careers dependent on external funding will find this certificate to be useful.

### Eligibility

Students do not need to be enrolled in a graduate degree program at MU to participate in the program.

### Plan of Study

Students must complete 12 credit hours to receive the certificate.

#### Required Courses

PUB_AF 8830	Grant Writing I	3
PUB_AF 8831	Grant Writing II	3
PUB_AF 8832	Sponsor Relationships	3
PUB_AF 8833	Grant Award Management	3

## Graduate Certificate in Nonprofit Management

Harry S Truman School of Public Affairs

101 Middlebush Hall

573-884-1656

<http://truman.missouri.edu/prospectivestudents/certificates.asp>

The graduate certificate in nonprofit management provides students with the managerial, fiduciary, and analytical tools necessary for leadership of nonprofit entities. The goal is to develop and hone skills that can be used to achieve organizational missions uniquely aimed at serving the interests of the community.

### Eligibility

Students do not need to be enrolled in a graduate degree program at MU to participate.

### Careers

As one of the fastest growing sectors in today's economy, nonprofit organizations have undergone a professionalization in management, with board members changing their orientation from one of personal networks to a bottom-line, information-based outlook. Successful nonprofit organizations today thrive on their ability to compete effectively in the marketplace, read community needs and priorities, and deliver appropriate services within budget.

### Plan of Study for the Nonprofit Management Certificate

Students must complete 12 credit hours to receive the certificate.

#### Required Courses

PUB_AF 8710	The Nonprofit and Voluntary Sector	3
PUB_AF 8720	Budgeting and Financial Management in the Public and Nonprofit Sector	3

### Elective Course

The third and fourth courses are electives chosen in consultation with the certificate coordinator from among the courses offered by the Truman School or by another graduate unit at MU.

## Graduate Certificate in Organizational Change

Harry S Truman School of Public Affairs

101 Middlebush Hall

573-884-1656

<http://truman.missouri.edu/prospectivestudents/certificates.asp>

The graduate certificate in organizational change is a multidisciplinary and multisector approach to the theory and practice of transforming organizations and communities in a technologically advanced and global economy. Students will have an opportunity to develop knowledge and competencies appropriate to the advanced study and diagnosis of evolving and emerging organizations and communities in the public, private, and nonprofit arena. They will find a curriculum supportive of careers in academics, management, and consulting.

### Eligibility

Students do not need to be enrolled in a graduate degree program at MU to participate in the program.

### Plan of Study

Students must complete 12 credit hours to receive the certificate.

#### Required Courses

PUB_AF 8610	Group Dynamics and Conflict Resolution	3
PUB_AF 8620	Organizational Analysis and Change	3
PUB_AF 8630	Organizational Change in a Community and Global Context	3

### Elective Course

The fourth course is an elective chosen in consultation with the certificate coordinator from among the courses offered by the Truman School or by another graduate unit at MU.

## Graduate Certificate in Public Management

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Harry S Truman School of Public Affairs  
 101 Middlebush Hall  
 573-884-1656  
<http://truman.missouri.edu/prospectivestudents/certificates.asp>

The graduate certificate in public management encompasses administrative skills for ethical, effective leadership and management roles in the public service. Students completing this graduate certificate will be well positioned to begin or advance a public service career with many expecting to pursue management careers in state and local governments.

### Eligibility

Students do not need to be enrolled in a graduate degree program at MU to participate.

### Plan of Study

Students must complete 12 credit hours to receive the certificate.

### Required Public Management Certificate Courses

The first two courses are required along with one of the remaining two:

PUB_AF 8720	Budgeting and Financial Management in the Public and Nonprofit Sector	3
PUB_AF 8520	Human Resources Mngmnt & Development in Public & Nonprofit Sector	3
PUB_AF 8530	Strategic Management of Public Service Organizations: People, Information and Money	3
PUB_AF 8540	Local Government Management	3

### Elective Course

The fourth course is an elective chosen in consultation with the certificate coordinator from among the courses offered by the Truman School or by another graduate unit at MU.

## Graduate Certificate in Science and Public Policy

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Harry S Truman School of Public Affairs  
 101 Middlebush Hall  
 573-884-1656  
<http://truman.missouri.edu/prospectivestudents/certificates.asp>

The public policy specialization offers students a strong foundation in the skills necessary to work effectively in the policy environment. Students in the public policy specialization learn theories of the policy process, quantitative and qualitative research methods to analyze policy, and program evaluation. Students also have the opportunity to gain expertise

in specific policy areas including education policy, environmental policy, health policy, social policy, and regional development policy.

### Eligibility

Students do not need to be enrolled in a graduate degree program at MU to participate in the program. Some prerequisite courses may be necessary.

### Plan of Study

Students must complete 12 credit hours to receive the certificate.

#### Required Courses

PUB_AF 8170	Public Policy Processes and Strategies	3
PUB_AF 8430	Public Policy Analysis	3

### Elective Course

The third and fourth courses are electives chosen in consultation with the certificate coordinator from among the courses offered by the Truman School or by another graduate unit at MU.

## **Interdisciplinary Academic Programs**

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MU offers a number of academic degree programs that are planned, administered and taught collaborative by faculty from numerous disciplines. Those interdisciplinary programs are enumerated in this section of the catalog.

## Biomedical Sciences

The study of biomedical sciences includes the major disciplines of:

- anatomy (gross or microscopic)
- physiology/pharmacology (molecular, cellular and integrative)
- biochemistry/molecular biology
- endocrinology
- toxicology

Specific areas of interest are exercise biology including cardiac, vascular and muscle biology; cardiovascular biology including neuroendocrine regulation; membrane transport biology including cystic fibrosis and cardiac disease; and reproductive biology including environmental estrogen toxicities and developmental processes.

All of the biomedical sciences degrees at MU are at the graduate level, and within two very distinct programs. See the Graduate tab for details on these options.

For undergraduate students interested in studying biomedical sciences, there are more than two dozen courses taught at the undergraduate level. See the Courses tab for details on these options.

## Faculty

### Comparative (Veterinary) Medicine

**Professor** C. L. Franklin

**Associate Professor** Y. Agca, E. C. Bryda

**Clinical Associate Professor** L. W. Dixon

**Adjunct Professor** C. L. Besch-Williford

**Adjunct Clinical Associate Professor** R. S. Livingston

**Clinical Veterinarian** S. W. Korte, E. K. O'Connor

### Pathobiology Emphasis

**Professor** C. R. Brow, C. Caldwell, S. Casteel\*, J. Cook, G. Davis, K. C. Dellsperger, W. Fales\*, C. Franklin#, C. Henry, T. Hoffma, G. C. Johnson\*, M. Katz, C. Lorson\*\*, D. Lubahn, C. Moore, D. O'Brien, B. Ray\*\*, R. M. Roberts, H. Schatten\*\*, D. Shaw\*, G. P. Smith, R. W. Stich\*, C. V. Ward, H. Zaghrou

**Associate Professor** Y. Agca\*\*, B. T. Beerntsen\*\*, A. Bermudez\*\*, D. Beversdorf, J. N. Bryan, E. Bryda\*\*, M. Calcutt\*\*, L. Cohn, D. D. Cornelison, J. Dodam, T. Evans\*\*, D. Fox, S. A Grant, G. S. Johnson, M. Lewis, S. Liu, J. Middleton, W. J. Mitchell Jr.\*, C. Phillips, C. Reddy, S. G. Sarafianos, C. Wiedmeyer\*\*

**Clinical Associate Professor** L. Berent\*, D. Kim\*, T. Reilly\*\*, C. Vogelweid\*, M. Whitney\*

**Associate Research Professor** M. Lorson\*, A. Ray\*

**Assistant Professor** K. Aldridge, D. Anderson\*, U. Atasoy, C. P. Baines, G. Blomquist, M. Daniels, V. Glinskii, Z. Gu, C. Holliday, K. Kuroki\*\*, S. Schommer\*, K. Taylor, G. Zhang\*

**Professor Emeritus** C. A. Carson

**R. Phillip and Diane Acuff Endowed Professor** D. Pintel

**McKee Endowed Professor** G. Stewart\*\*

## Biomedical Sciences: Veterinary Medicine and Surgery emphasis

**Professor** J. R. Coates\*\*, L. A. Cohn\*\*, J. L. Cook\*\*, V. K. Ganjam\*, C. J. Henry\*\*, P. J. Johnson\*, K. Keegan\*, T. Mann, R. R. Mohan\*, D. O'Brien\*\*, J. Tomlinson\*, D. A. Wilson\*

**Assistant Professor** S. M. Axiak\*, A. Bukoski\*, A. E. DeClue\*\*, M. Heller\*, P. Pithua\*, F. Wininger\*

**Associate Professor** B. Backus\*\*, J. Bryan\*\*, J. R. Dodam\*, D. Fine\*, D. B. Fox\*\*, E. Giuliano\*, R. Johnson, J. C. Lattimer\*, M. R. Lewis\*\*, J. R. Middleton\*\*, C. N. Reiner\*\*

**Clinical Assistant Professor** K. R. Branson\*

**Teaching Professor** I. Masseur\*

**Assistant Teaching Professor** L. Britt\*, C. R. Cook\*, D. Nagy\*, J. Pearce\*, S. Reed\*

**Associate Teaching Professor** M. Kerl\*, J. Kramer\*, L. Schultz\*, K. A. Selting\*

**Assistant Extension Professor** S. Pook\*

## Biomedical Sciences

**Professor** F. W. Booth\*\*, D. K. Bowles\*\*, L. L. Clarke\*\*, G. M. Constantinescu\*, J. R. Dodam, V. K. Ganjam\*\*, E. M. Hasser\*\*, C. M. Heesch\*\*, S. Hyder\*\*, H. M. Laughlin\*\*, R. L. Terjung\*\*, R. Tsika\*\*

**Associate Professor** C. S. Reddy\*\*, C. S. Rosenfeld\*\*, L. J. Rubin\*\*, W. V. Welshons\*

**Assistant Professor** C. P. Baines\*\*, K. Cummings\*\*, C. Emter\*\*, D. D. Kline\*\*

**Adjunct Professor** M. B. Brown\*, V. H. Huxley, S. S. Segal\*\*

**Adjunct Assistant Professor** T. Boyd

**Adjunct Associate Professor** G. S. Johnson\*, G. E. Rottinghaus\*

**Clinical Associate Professor** I. A. Constantinescu, B. L. Frappier\*

**Assistant Teaching Professor** D. Cross, M. C. Kuehl-Kovarik\*\*

**Research Professor** S. Yang\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

While MU does not offer undergraduate degrees specifically in biomedical sciences, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Graduate

### An Array of Biomedical Degrees Offered

The University of Missouri offers several degree program options in Biomedical Sciences:

- The **Biomedical Sciences Area Program** offers a master's program in basic biomedical sciences and a PhD area program. Dual biomedical-DVM degrees are other options. Students in the Biomedical Sciences Area Program do not have to be enrolled in the College of Veterinary Medicine.
- The Graduate School also confers three MS degrees related to veterinary biomedical sciences. Available emphasis areas are (a) comparative veterinary medicine, (b) pathobiology and (c) veterinary medicine and surgery. Generally, applicants to these biomedical degree programs are concurrently enrolled in College of Veterinary Medicine or have previously earned a Doctorate in Veterinary Medicine (DVM).

## Biomedical Sciences Area Program Degrees

- MS in Biomedical Sciences (p. 598)
- PhD in Biomedical Sciences (p. 599)

## Biomedical MS Degrees with Veterinary Medicine Emphasis Areas

- MS in Biomedical Science: Comparative Medicine (post DVM degree only) (p. 600)
- MS in Biomedical Science: Pathobiology (p. 601)
- MS in Biomedical Science: Veterinary Medicine and Surgery (p. 601)

## Additional Program Options

### Pathobiology

The Pathobiology Area Program offers a PhD in Pathobiology (p. 626).

## DVM/Graduate degree in Biomedical Sciences

The Biomedical Sciences graduate programs enable veterinary medical students to pursue studies in the basic biomedical discipline of their choice for a PhD or MS degree while enrolled in the College of Veterinary Medicine. The program is designed to prepare students for advanced professional careers in universities and colleges, research institutes and industrial research.

With consent of the student's graduate program committee, courses from the professional curriculum (which includes a major portion of the core curriculum) can be accepted toward the graduate degree.

**Master of Science:** The MS/DVM program enables veterinary medical students to complete a master's degree while enrolled in the College of Veterinary Medicine. The program allows qualified students to seek in-depth involvement in the basic biomedical discipline of their choice. Six hours of 9090 Research that result in an original thesis are required. Financial support may be provided to VM2-4 students through teaching assistantships in gross anatomy laboratory (V\_BSCI 5500 Veterinary Anatomy with Laboratory).

**Doctor of Philosophy:** The PhD/DVM program requires a minimum of 30 credit hours of 9090 Research culminating in completion of original research and defense of a written dissertation.

Major biomedical disciplines include anatomy of domestic species (gross or microscopic); physiology/pharmacology (molecular, cellular and integrative); biochemistry/molecular biology; endocrinology; and toxicology. Specific areas of interest are exercise sciences;

cardiovascular and neurosciences; muscle biology; membrane transport biology; reproductive biology; and developmental toxicology.

Admission Contact Information  
 Brenda Klemme [klemmeb@missouri.edu](mailto:klemmeb@missouri.edu)  
 W111 Veterinary Medicine Building  
 1600 Rollins Road  
 Columbia, MO 65211  
 573-882-7305  
<http://www.dbms.missouri.edu/>

## Graduate

## MS in Biomedical Sciences

### Master of Science in Basic Biomedical Sciences

Director of Graduate Studies Dr. Douglas Bowles  
 Biomedical Sciences Area Program  
 W111 Veterinary Medicine Building  
 1600 Rollins Road  
 Columbia, MO 65211  
 573-882-7305  
<http://www.dbms.missouri.edu/>

### About the Program

The MS program in Basic Biomedical Sciences provides in-depth training to prepare scientists in interdisciplinary basic research (molecular, cellular, organ and integrative). Departmental faculty members represent diverse Medical-related basic science disciplines that provide a unique opportunity for biomedical research training. Core courses include physiology, cell biology and an introduction to research methodology. The multidisciplinary focus of the program is also emphasized in the candidate's MS program committee.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Admission Criteria

- Fall deadline: January 15
- Spring deadline: September 15
- Summer deadline: Not Applicable
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	100 3.5
On or After August 1, 2011	300 3.5

- Minimum GPA: 3.0

- Required prerequisite courses: Biology (10 hrs), Physics (3 hrs), Biochemistry (3 hrs), Chemistry (10 hrs), Calculus (3 hrs)

NOTE: The GRE requirement may be waived for applicants with an MD or DVM. Prerequisite courses may be completed during the master's program.

## Required Application Materials

To the Graduate School:

- All required Graduate School documents

To the Biomedical Sciences MS Program:

- Program-specific application
- Letter of intent
- GRE scores
- Copy of transcripts
- 3 letters of recommendation

## MS Degree Requirements

To attain the master's degree, 30 hours of graduate credit must be completed; 15 hours or more shall be 8000 level (exclusive of research, problems and independent study courses); and 6 to 9 hours of 8090 Research. A grade of 3.0 or better is required in all core courses and serves as the qualifying examination for the degree. In addition to the departmental core courses, students may take courses specifically planned to meet the needs and strengths of the individual.

## Evaluation

The master's candidate is evaluated semiannually for satisfactory rate of progress as defined by timely completion of course courses and progress on research activities as stipulated by the master's program committee. The master's candidate must carry out original research culminating in a written thesis, present the thesis work at a departmental seminar and defend the thesis in an oral examination by the master's program committee.

## Length of Study

The time limit for the master's degree is five years after initiating the program.

## PhD in Biomedical Sciences

Director of Graduate Studies Dr. Douglas Bowles  
 Biomedical Sciences Area Program  
 W111 Veterinary Medicine Building  
 1600 Rollins Road  
 Columbia, MO 65211  
 573-882-7305  
<http://www.dbms.missouri.edu/>

## About the Doctoral Degree Program

The Biomedical Sciences Area PhD is a multidisciplinary program that integrates molecular, cellular and systemic biology within the context of biomedical research. The program provides the student with the background to investigate questions relevant to the Medical sciences at the integrative, molecular or cellular level and to relate the findings to mammalian physiology. Training in both fundamental and state-of-the-art research methodologies help students develop the skills necessary for competitive biomedical research. The program is administered through

the Department of Biomedical Sciences (College of Veterinary Medicine) that has research faculty representing a diversity of medical-related basic science disciplines, including anatomy, biochemistry, histology, pathology, molecular biology, physiology, pharmacology and toxicology. The program offers a rich environment for graduate study and a unique opportunity for training scientists in comprehensive interdisciplinary research.

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Admission Criteria

- Fall deadline: December 15
- Spring deadline: September 15
- Summer deadline: Not Applicable
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1000	3.5
On or After August 1, 2011	300	3.5

- Minimum GPA: 3.0
- Required prerequisite courses: Biology (10 hrs), Physics (3 hrs), Biochemistry (3 hrs), Chemistry (10 hrs), Calculus (3 hrs)

NOTE: The GRE requirement may be waived for applicants with an MD or DVM.

## Degree Requirements

To attain the PhD degree, 72 hours of graduate credit must be completed:

15 hours or more at the 8000/9000 level (exclusive of research, problems and independent study courses)

The core curriculum includes:

- physiology (10 credit hours)
- biochemistry/cell biology or histology (4 or 5 credit hours, respectively)
- multidisciplinary approaches to biomedical research (2 credit hours)
- departmental seminar (2 credit hours)

Minimum of 1 additional 7000-level course in each of the following areas:

- molecular biology
- cellular biology
- integrative biology

## Rate and Quality of PhD Progress

A grade of 3.0 or better is required in the core curriculum and serves in lieu of a qualifying examination for the degree. The choice of additional courses will be made individually by the student in consultation with his/her adviser and doctoral program committee. Following completion of the plan of study, candidates for the PhD degree must pass a comprehensive

examination designed by the doctoral program committee that reflects an understanding of the multidisciplinary approach to biomedical research. The PhD candidate is evaluated semiannually by a faculty committee to ensure a satisfactory rate of progress as defined by timely completion of core courses and productivity in research activities as stipulated by the student's doctoral program committee. The PhD candidate must carry out original research culminating in a written dissertation, present the dissertation work at a departmental seminar and defend it in an oral examination given by the doctoral program committee. The program for the PhD degree must be completed within five years of passing the comprehensive examination.

## **MS in Biomedical Science: Comparative Medicine (post DVM)**

**Note: This is a Post-DVM Master of Science Degree**

### **Admission Contact Information**

Director of Graduate Studies Craig Franklin, DVM, PhD  
Discovery Ridge Bldg Rm N128  
4011 Discovery Drive  
Columbia, MO 65201  
573-882-6623  
<http://cmp.missouri.edu/>

### **About This Degree**

The University of Missouri Comparative Medicine Program provides advanced graduate training to veterinarians who wish to pursue careers in comparative medicine. Trainees may combine one year of residency training in clinical, administrative and diagnostic laboratory animal medicine with two or more years of research training. Alternatively, trainees with experience in laboratory animal medicine, comparative pathology or related disciplines may begin research training at the time of admission. Training is designed to prepare individuals for a variety of careers including comparative medicine research and laboratory animal medicine/collaborative research. Students may either pursue an MS or PhD. Research opportunities are available in several areas including infectious disease, molecular biology, mouse biology, genetics, microbiota, biomedical engineering, cancer and cardiovascular physiology. Resources available include the University of Missouri Office of Animal Resources (OAR), the Laboratory of Infectious Disease Research (LIDR), Mutant Mouse, Rat and Swine Resource and Research Centers and IDEXX-RADIL, an internationally known research animal diagnostic laboratory.

### **Programmatic Strengths**

- The opportunity for comparative studies in a joint veterinary and human medical environment
- The multidisciplinary nature of the faculty participating in the training program
- The potential to couple training in research with residency training in laboratory animal medicine, comparative pathology, diagnostics, and training toward board certification

- Strong research resources including AAALAC-accredited research animal facilities, a full-service, internationally-recognized research animal diagnostic laboratory, a BSL-3 infectious disease research facility and NIH-funded research resource centers for mice, rats and swine
- A long history of successful training in comparative medicine

### **Class Size & Resources**

Typically there are 10-12 postdoctoral trainees in the program at a given time. Networking and sharing of experiences and cooperation among trainees is an important factor in the success of the program.

### **Admission Criteria**

- Fall deadline: N/A
- DVM or equivalent from an accredited college of veterinary medicine or successful completion of the foreign equivalency examination and approval by the Comparative Medicine Program faculty
- Meet standards for admission to the Graduate School

### **Required Application Material**

*To the Graduate School:*

- All required Graduate School documents

*To the CMP Postdoctoral MS Program:*

- curriculum vitae
- statement of career goals and interests
- complete transcripts
- Graduate Record Examination Scores (if available)
- three letters of reference

### **Degree Requirements**

The CMP emphasizes comparative medicine research training and includes graduate course work. Research training is performed under an established investigator in one of several life science departments on the MU campus. Recommended graduate courses include pathology of laboratory animals, methodology of animal experimentation, biology of laboratory animals, laboratory animal resource management, grant and manuscript writing for biomedical researchers, laboratory and project management, biomedical ethics and seminars. Elective courses frequently taken by trainees include basic and advanced courses in immunology, molecular biology, physiology, reproductive biology and/or disease pathogenesis. Research typically deals with the application of an animal model in the investigation of human diseases or the study of naturally occurring diseases of laboratory animals. Requirements for elective course work, residency and teaching experience are determined with the student's advisory committee. Trainees also participate in teaching and instructional programs offered to veterinary students and research personnel.

### **Written Scholarly Work**

The MS degree requires the completion of a significant manuscript suitable for publication in a refereed journal, or an approved equivalent scholarly effort.



## Residency

For trainees enrolled in the combined graduate/residency program, residency rotations are performed during the first year of training and research training occurs in years two and three.

Residency rotations include:

- clinical medicine and animal resource management in the Office of Animal Resources (OAR)
- colony management, diagnostic, comparative and research pathology in the Mutant Mouse Regional Resource Center (MMRRC) and Rat Resource and Research Center (RRRC)

## Moving to a PhD Program

Trainees desiring to change to a PhD program have the opportunity to do so in a variety of programs including the **Pathobiology Area Program**.

## MS in Biomedical Science: Pathobiology

Contact: Anne Chegwidena  
College of Veterinary Medicine  
201 Connaway Hall  
Columbia, MO 65211  
573-884-2444  
chegwidena@missouri.edu  
[http://vpbio.missouri.edu/training\\_programs.html](http://vpbio.missouri.edu/training_programs.html)

**Director of Graduate Studies:** Catherine Vogelweid

## About the Program

The College of Veterinary Medicine offers a Master of Science degree in biomedical sciences with a specialization in veterinary pathobiology and/or laboratory animal medicine, which is administered through the Department of Veterinary Pathobiology. The degree requires 30 credit hours of work including courses, seminars, research, and problems courses. The program includes research in a particular field and defense of a thesis which embodies the results of this work. Certain areas of emphasis require submission of a formal master's thesis while others require preparation of a publishable manuscript.

## PhD in Pathobiology

For admission information about the doctorate of philosophy (PhD) in Pathobiology, refer to **Pathobiology Area Program** in this catalog.

## Admission Criteria

Fall deadline: n/a

- Minimum TOEFL score (when appropriate):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- GRE scores required
- Undergraduate GPA of last 60 credits of undergraduate work: 3.0
- Designated faculty mentor
- Professional students with a DVM degree may be eligible to waive the GRE

## Required Application Materials

**To the Graduate School:**

- All required Graduate School documents

**To the Veterinary Pathobiology Program:**

- 3 letters of recommendation (can be submitted through the Graduate School's online application as well)
- GRE scores
- Mentor letter of support

## MS in Biomedical Science: Veterinary Medicine and Surgery

Contact: Connie Sievert  
College of Veterinary Medicine  
Department of Veterinary Medicine and Surgery  
A-384 Clydesdale Hall  
573-882-1807  
<http://www.cvm.missouri.edu/VMS/index.htm>

**Director of Graduate Studies:** Leah Cohn

## About the Program

The College of Veterinary Medicine, through the Department of Veterinary Medicine and Surgery, offers graduate work leading to the master of science degree in veterinary biomedical sciences with an emphasis in veterinary medicine and surgery. In addition, faculty within the department offer supervision for doctoral and postdoctoral study and research. Many but not all graduate students in this area of study combine their graduate degree training with clinical residency programs leading to board certification in some specialty field within veterinary medicine.

## Types of Study

The program provides advanced training in anesthesiology, comparative cardiology, equine, food animal and companion animal medicine and surgery, neurology, oncology, comparative ophthalmology, radiation oncology, radiology, nutrition, and theriogenology among other areas.

## Resources and Facilities

Graduate students have ready access to clinical patients, medical records and facilities of the Veterinary Medical Teaching Hospital to aid them in clinical research. The college has its own library. More detailed information regarding the emphasis area of veterinary medicine and surgery can be found at the website <http://www.cvm.missouri.edu/VMS/index.htm>

## Admission Criteria

Fall deadline: n/a

- Completion of a bachelor's or professional degree
- Identification of a mentor with graduate faculty standing within the Department of Veterinary Medicine and Surgery
- Identification of funding (with advice of mentor) for the period of research and study
- Minimum TOEFL score (when appropriate):

Internet-based test (iBT)	Paper-based test (PBT)
120	520

- Minimum GRE score: none

The majority of MS students within our program are completing specialty residency training programs in some field of veterinary medicine simultaneously with the MS degree. Admission to these programs generally precedes admission to our graduate programs. The GRE requirement may be waived for exceptional students by the Veterinary Medicine and Surgery Departmental Research and Graduate Studies Committee. Applicants may be asked to strengthen any deficiencies in prerequisites to the chosen area of concentration through enrollment in a post- or non-degree graduate student program.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Veterinary Medicine and Surgery Emphasis Program:*

- GRE scores

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Degree Requirements

Advisers and the Advisory Committee

Formulating a plan of study is the joint responsibility of the student, the adviser and the student's advisory committee. An advisory committee of at least three faculty members should be chosen during the first semester of enrollment. The advisory committee offers guidance and is responsible for approving a definitive plan of study.

The advisory group should consist of the major adviser and appropriate faculty members from the department, and at least one other member from another department within the college or university. Members of this committee may be recommended later for appointment to the examining committee. Members of the final examination committee should be chosen in the same manner as the advisory committee.

## Publications

A thesis reporting the results of original research is required of all candidates. A scientific paper based on the thesis research must be submitted to a refereed journal.

# Dispute Resolution

## About the Dispute Resolution Program

Students in the Master of Laws (LL.M.) dispute resolution program have a unique opportunity to gain a deeper understanding of theoretical, policy, design and ethical issues in dispute resolution. They study with leading dispute resolution scholars who generate important academic work influencing dispute resolution theory and practice around the world. Small class sizes create a close community with faculty and students.

Our program blends theoretical analysis, practitioner skills, and systems design work in courses usually limited to LL.M. students. Our diverse student body — by age, race, nationality, legal background — enriches the level of discussion, inside and outside the classroom.

The LL.M. meets the needs of those with backgrounds as advocates, neutrals, law-trained court administrators and government agency personnel, among others.

## Admission Requirements

Applicants must have completed the first degree in law (JD, LLB or equivalent) required for law practice or law teaching in the country in which law studies were pursued. Note: U.S. applicants must have satisfied the JD requirements of an ABA-accredited law school. In exceptional cases, U.S. applicants may be admitted if they have satisfied the JD requirements of a non-ABA-accredited law school.

- Applicants may be admitted without a JD degree if they have a bachelor's degree and **substantial** experience in dispute resolution.
- Applicants must possess a minimum 2.5 (A = 4.0) grade point average in their law program, and a 3.0 GPA for work completed in any additional graduate or advanced degree program.
- Applicants must be able to start the program in the fall semester (which begins in mid-August). New students are not admitted in the spring or summer semesters.

## Contact Information

**Assistant Dean and Director of the Center for the Study of Dispute Resolution** Robert G. Bailey

**Associate Director of the Center for the Study of Dispute Resolution** James Levin

**Director of LL.M. in Dispute Resolution Program & Director of the Campus Mediation Service** Paul Ladehoff

LLM Program - MU School of Law  
206 Hulston Hall  
University of Missouri  
Columbia, MO 65211

Phone: (573) 882-2020; Fax: (573) 882-3343

Email: [mulawcdr@missouri.edu](mailto:mulawcdr@missouri.edu)

Web site: <http://law.missouri.edu/csdr/llm>

## Faculty

**Professor** R. Gely\*, J. Lande\*, I. Lee\*, R. Reuben\*, R. Uphoff\*, J. Westbrook

**Associate Professor** C. Conklin\*, D. Crouch\*, S. I. Strong\*

**Adjunct Assistant Professor** J. Levin\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

While MU does not offer undergraduate degrees specifically in dispute resolution, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Graduate

### Program of Study

The LL.M. program requires 24 credit hours of study. A minimum of 12 credits are required courses in dispute resolution and the remaining 12 credits are electives. Students choose electives according to their interests. With approval of the director of the LL.M. Program, students can apply six (6) credits of graduate-level courses outside the Law School toward the LL.M. graduation requirements.

Students studying full-time can complete degree requirements within one academic year. Part-time students in a continuous course of study can complete the program within two academic years.

#### Required Courses

LAW 6905	LLM Arbitration Seminar	3
LAW 6930	LL.M. Major Research Project	3
LAW 6935	Dispute System Design	3
LAW 6945	Non-Binding Methods of Dispute Resolution	3

#### Possible Electives

LAW 5450	Conflict and Conflict Management	12
LAW 5485	Cross-Cultural Dispute Resolution	
LAW 5537	Emotional Intelligence in Law	
LAW 6920	LL.M. Externship	
LAW 6925	LL.M. Independent Study	
LAW 5770	Mediation Clinic	
LAW 5840	Public Policy Dispute Resolution	
LAW 6950	Practicum on Dispute Resolution Training and Education	
PUB_AF 8610	Group Dynamics and Conflict Resolution	
PUB_AF 8620	Organizational Analysis and Change	
PUB_AF 8630	Organizational Change in a Community and Global Context	
PUB_AF 8160	Organizational Dynamics and Leadership	
THEATR 4240	Theory and Practice of Theatre of the Oppressed	

## Tailoring the Program

In addition to the recommended electives outlined above, the MU Law School offers courses in many areas. Refer to the Courses tab above for course descriptions. Please note: Every effort is made to teach each of

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these courses every year, but the ability to offer them depends on faculty availability and budget constraints.

Some of the concentrated areas in the J.D. curriculum include:

- Business Planning/Corporations
- E-commerce
- Employment
- Environmental Law
- Family
- Governmental Processes
- Healthcare
- International Law
- Normative Theory and Diversity
- Tax
- Trial Practice

## Genetics Area Program

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Genetics Area Program  
241 Engineering West  
Columbia, MO 65211  
573-882-9007  
877-GENE-PHD (877-436-3743)  
<http://www.gap.missouri.edu/>  
Email: [gap@missouri.edu](mailto:gap@missouri.edu)

The Genetics Area Program (GAP) is an interdisciplinary Ph.D. program that will prepare you for a research or teaching career in genetics. As genetic analysis is used in all aspects of biological research, our Program has integrated the efforts of approximately 60 life sciences faculty into one of the strongest training programs at MU.

The curriculum provides broad, individualized training tailored to your career objectives.

### Faculty

**Professor** S. Alexander\*\*, K. L. Bennett\*\*, J. A. Birchler\*\*, A. K. Chatterjee\*, G. Davis\*\*, D. Duan\*\*, D. W. Emerich\*\*, W. R. Folk\*\*, J. Gorski, T. J. Guilfoyle\*\*, J. P. Gustafson\*, M. Hannink\*\*, G. Hazelbauer\*\*, M. L. Katz\*\*, M. Liscum\*\*, C. Lorson\*\*, D. B. Lubahn\*\*, B. A. McClure\*\*, K. J. Newton\*\*, H. Nguyen\*\*, D. J. Pintel\*\*, J. E. Schoelz\*\*, R. D. Semlitsch\*\*, D. Setzer\*, D. A. Slepser\*, G. Stacey\*\*, J. J. Tanner\*\*, J. Taylor\*\*, J. C. Walker\*\*, H. Zaghouani\*\*

**Curators' Professor** R. M. Roberts\*\*

**Associate Professor** E. A. Bryda\*\*, D. Burke, J. F. Cannon\*\*, A. Chandrasekhar\*\*, G. L. Davis\*\*, C. Franklin\*\*, W. Gassmann\*\*, M. W. Golomb\*\*, L. J. Holland\*\*, T. P. Holtsford\*, G. S. Johnson\*, T. Kazic\*\*, M. Kirk\*\*, D. R. Lee\*\*, M. E. Martin\*, B. Peculis\*\*, C. L. Phillips\*\*, C. Tan, T. Zars\*\*, S. Zhang\*\*

**Assistant Professor** M. Garcia\*\*, S. Sarafianos

**Adjunct Professor** H. B. Krishnan\*

**Adjunct Associate Professor** M. D. McMullen\*\*

**Adjunct Assistant Professor** S. Flint-Garcia\*\*

**Research Professor** G. Hagen\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in the genetics area program, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

- PhD in Genetics Area Program (p. 605)

### About the Program

We believe that an understanding of genetics is essential in solving global problems such as famine, environmental degradation and disease.

The Genetics Area Program (GAP) is an interdisciplinary PhD program that will prepare you for a research or teaching career in genetics. As genetic analysis is used in all aspects of biological research, our Program has integrated the efforts of approximately 60 life sciences faculty into one of the strongest training programs at MU. The curriculum provides broad, individualized training tailored to your career objectives.

Genetics graduate students play a major role in the research programs of our life sciences departments. Students spend approximately twelve weeks in three different laboratories during their first year. This promotes diversity in techniques learned, and it encourages students to meet and work with faculty members in the associated departments. This scientific interaction helps our students choose a lab in which to complete the degree.

As part of the degree, students will spend a semester teaching or assisting with a course in the Genetics curriculum that is relevant to their career goals.

A genetics seminar series is organized and conducted by the graduate students to promote research interest and encourage scientific communication. Speakers include prominent researchers from universities throughout the country, as well as MU faculty. An annual retreat brings faculty and students together to share research results and techniques.

Genetics graduates leave MU with a strong scientific background, excellent laboratory skills and interpersonal communication abilities.

### Courses

Courses for the Genetics Area Program curriculum are from a number of other areas at the University including the following: Animal Sciences (AN\_SCI) (p. 712), Biochemistry (BIOCHM) (p. 745), Biological Sciences (BIO\_SC) (p. 751), Chemistry (CHEM) (p. 770), Computer Science (CMP\_SC) (p. 797), Microbiology (MICROB) (p. 1011), Plant Sciences (PLNT\_S) (p. 1074). For a complete listing of all courses offered at MU, refer to the Course Offerings (p. 697) in the catalog.

### Graduate

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## PhD in Genetics Area Program

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### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Application Deadline

Fall deadline: January 15

### Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
93	580

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	4.5
On or after August 1, 2011	302	4.5

- Minimum GPA: 3.0 in last 60 hours
- Bachelor's degree
- One or more courses in each of the following: organic chemistry, biochemistry, mathematics (calculus and statistics), physics, introductory genetics
- Research experience highly desirable
- Broad background in biology

Note: Deficiencies in the subjects listed can be remedied after admission.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Genetics Area Program:*

Genetics Area Program application (download form from website)

- GRE scores
- TOEFL scores (international applicants)
- 3 letters of recommendation (use provided form)
- Personal statement

## Degree Completion Requirements

The minimum requirements for the PhD degree are:

- advanced courses in genetics, biochemistry and molecular biology
- regular participation in the genetics area seminar program
- successful completion of a comprehensive examination
- at least one semester of teaching in a genetics course
- 3 seminar presentations
- research, dissertation and oral defense

These are *beyond* the Graduate School's requirements. Others are determined in consultation between the student and faculty adviser.

## Health Administration

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Academic programs at MU in the area of Health Administration are offered through the Department of Health Management and Informatics (HMI) in the School of Medicine.

School of Medicine  
CE 707 Clinical Support and Education Building, DC006.00  
One Hospital Drive  
573-884-0698  
<http://www.hmi.missouri.edu/>

### About Health Management and Informatics

The HMI Department develops, translates, and disseminates knowledge, innovations, and evidence-based solutions to improve health management and informatics performance in complex health systems. HMI advances the health of Missouri's communities, the nation, and international partners by:

- Creating a culture of collaborative relationships in research, education, and service to generate innovative ideas and solutions;
- Providing professional health management and informatics education and fostering lifelong learning;
- Delivering technical assistance and consultation by partnering with health, human service, and policy-making organizations; and
- Developing innovative commercial products and services for health- and education-related applications.

### Faculty

**Professor** E. J. Simoes\*\*, L. L. Hicks\*\*, D. Wakefield\*\*  
**Associate Professor** S. A. Boren\*\*, J. W. Davis\*\*, N. Khatri\*\*, M. Popescu\*\*, I. Yoo\*\*  
**Assistant Professor** M. S. Kim\*, R. Leung\*, C. Rathert\*\*  
**Clinical Professor** K. D. Bopp\*, D. A. Fleming\*, G. M. Sill  
**Clinical Assistant Professor** W. G. Phillips\*, W. Wells\*  
**Clinical Instructor** P. E. Alafaireet\*, W. E. Meyer\*, D. E. Moxley\*  
**Associate Research Professor** J. Jackson-Thompson\*  
**Assistant Research Professor** G.F. Petroski\*  
**Adjunct Professor** A. Grant  
**Adjunct Assistant Professor** C. Bryan, S. Riley  
**Adjunct Clinical Instructor** M. Harris  
**Adjunct Instructor** K. Lobenstein  
**Professor Emeritus** G. D. Brown\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in health administration, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

- MHA in Health Administration (p. 607)

### About the Master of Health Administration

The Graduate Program in Health Services Management prepares professionals to meet critical and complex challenges in leadership and improvement in organizations and systems throughout the health industry. The program provides recognized national and global leadership in health management education.

The program is competency-based and distinctively equips graduates for success through (a) providing solid grounding in professional and operational knowledge and skills, (b) integrating health informatics throughout the health services management curriculum, and (c) incorporating overarching complex systems context and analytical approaches.

The residential and executive master's degrees launch and advance patient-centered, improvement-oriented, financially-responsible, and ethically-grounded careers in evidence-based health services management.

The program admits diverse cohorts of students from Missouri, other states, and other nations. During the admissions process, the program seeks learners with strong academic records, maturity, motivation, leadership capabilities, and career potential. Primary post-graduation placement organizations include health systems, hospitals, academic medical centers, physician group practices, surgery centers, information technology companies, consulting firms, government agencies, insurance entities, and other points of health services delivery.

Whereas the residential master's degree format is a traditional on-campus residential program, the executive master's degree is offered in a hybrid model featuring both on-campus and distance learning. In both formats, emphasis is on fostering an individualized and collaborative culture of learning, mentoring, and professional development among students, faculty, staff, alumni, and other practitioners. The intent is to prepare students to enable transformational leadership and improve patient care quality, safety, value, and overall level of population health.

Established in 1965, the program is a member of the Association of University Programs in Health Administration (AUPHA) and has been accredited since 1968 by the Commission on Accreditation of Healthcare Management Education (CAHME), formerly Accrediting Commission on Education for Health Services Administration (ACEHSA).

Students may pursue the MHA degree jointly with the following degree programs: MS in Health informatics, MBA, MS in Industrial Engineering, JD. It is also possible to pursue other Master's degrees, such as a MPA or MPH, concurrently with the MHA program.

### Graduate

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## MHA in Health Administration

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### Admission Contact Information

Veronica Kramer (KramerV@health.missouri.edu) or hmi-admissions@health.missouri.edu  
CE 707, Clinical Support and Education Building, DC006.00  
One Hospital Drive

Columbia, MO 65212  
573-884-0698

## MHA Curriculum

The MHA curriculum is designed for a range of educational backgrounds and provides the knowledge and skills necessary to function effectively as a healthcare executive. The curriculum includes such competency areas as health systems operations, organization theory, information management, financial management, strategic planning and marketing, human resource management, health economics, managerial epidemiology, leadership, and ethics. By combining basic and advanced course work with an internship and executive management study (an applied management study that replaces a thesis), the student may develop expertise in a focused area. Professional elective course selection is a mutual decision between the student and adviser, and in all cases, the intent is to tailor the degree program to the student's interests.

The goal of the graduate program in health services management is to prepare professionals for leadership roles in health administration. Students develop an excellent applied knowledge in such areas as clinical decision support systems, risk assessment and management, clinical outcomes assessment, managing interdisciplinary teams and integrated health systems.

## Admission Criteria

Deadline for Fall entrance: Rolling, recommended by March 31st

A minimum of a baccalaureate degree from an accredited institution

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	603

- Minimum Academic IELTS scores:

Item	Score
OVERALL	7.5

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	50th percentile
On or After August 1, 2011	50th percentile

- In lieu of GRE, minimum GMAT score: 50th percentile
- Undergraduate GPA: 3.0 during the last 60 hours of undergraduate course work and any subsequent graduate course work

The Health Services Management Program recruits and accepts qualified applicants regardless of race, sex, age, physical ability, or national origin.

## Required Application Materials

*To the Graduate School:*

All required Graduate School documents

*To the HMI Program*

3 letters of recommendation

GRE or GMAT scores

Current resume or curriculum vitae

Personal essay

Official transcripts

TOEFL report (international applicants only)

## Financial Aid from the Program

Students admitted to the MHA program are automatically considered for merit-based scholarships. A list of scholarships available through the Department as well as external scholarships and other sources of aid is available at: [http://hmi.missouri.edu/prospective/financial\\_aid.html](http://hmi.missouri.edu/prospective/financial_aid.html). A limited number of Graduate Research Assistantship (GRA) positions, which include a full tuition waiver, are available within the HMI Department. All incoming and current students receive consideration and the Department awards GRAs based on merit, the availability of project funding, and alignment of student and faculty research interests and skills. All admitted students who are not Missouri residents are considered for Out-of-state fee waivers, which include a \$1,000 scholarship and waive nonresident fees. Applicants admitted on probation are not eligible for GRAs, fee waivers, or scholarships until they attain a 3.0 GPA.

## Joint Degrees

Students may pursue the MHA degree jointly with the following degree programs: MS in Health Informatics, MBA, MS in Industrial Engineering, JD. It is also possible to pursue other Master's degrees, such as a MPA or MPH, concurrently with the MHA program.

## Degree Completion Requirements

The residential MHA curriculum requires 39 credit hours of core health services management course work, six hours of professional electives, and three credit hours for a summer internship. Three foundation courses (nine credit hours)—fundamentals of microeconomics, accounting, and finance—must also be completed prior to or during the MHA program. To graduate, a student must maintain a GPA of 3.0 (A=4.0) or better.

## Plan of Study

In the first year, the graduate program develops the theoretical background and skills necessary for analyzing complex health system problems and for thinking innovatively. After completion of the first two semesters, students complete a 12-week internship under the guidance of a qualified preceptor in an approved healthcare organization. This enables students to gain experience in the field, encounter issues and problems in day-to-day operations, and apply the concepts and skills obtained during the first year of course work. Clinical and field experience sites are provided by healthcare organizations throughout the country. During the internship, students generally are paid a monthly stipend. The second year builds on the conceptual, theoretical, and experiential base of the first year, providing increased flexibility for concentration in various administrative and planning areas and allowing students to pursue more independent learning. Emphasis is placed on the development of an individual with the behavioral and decision-making skills necessary for a leadership position in a changing healthcare environment. Additionally, all students are required to complete an Executive Management Study (EMS) project and to pass an oral examination that enables faculty to evaluate the student's competency in health management.

## Sample Plan of Study

First Year					
Fall	Credits	Spring	Credits	Summer	Credits
HMI 7410	3	HMI 8524	3	HMI 8810 (Summer internship)	3
HMI 8460	3	HMI 8461	3		



HMI 8544	3	FINANC 7410*	1.5	
ECONOM 1014*	3	FINANC 7420*	1.5	
ACCTCY 7310*	3	Professional Electives	6	
	<b>15</b>		<b>15</b>	<b>3</b>
<b>Second Year</b>				
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>	
HMI 7430	3	HMI 8450	3	
HMI 8470	3	HMI 8571	3	
HMI 8472	3	HMI 8574	3	
HMI 8573	3	HMI 8575	3	
	<b>12</b>		<b>12</b>	
Total Credits: 57				

\* Foundation course credit taken as part of the MHA program do not count toward the credit hours required for the degree.

## Executive MHA Program

In addition to the traditional degree program, an alternative format program is offered for healthcare professionals who have significant clinical or administrative experience in health care. The executive MHA program, which begins in January, combines monthly on-campus weekend sessions, independent study, and online interaction in an innovative two-year course of study. The executive MHA program requires 42 credit hours of core health services management coursework. For additional information about the Executive MHA Program, please call the coordinator of student recruitment at (573) 884-0698, or visit <http://www.hmi.missouri.edu>.

## Health Informatics

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Academic programs at MU in the area of Health Informatics are offered through the Department of Health Management and Informatics in the School of Medicine.

School of Medicine  
CE 707, Clinical Support and Education Building, DC006.00  
One Hospital Drive  
573-884-0698  
<http://www.hmi.missouri.edu/>

### About Health Management and Informatics

The HMI Department develops, translates, and disseminates knowledge, innovations, and evidence-based solutions to improve health management and informatics performance in complex health systems. HMI advances the health of Missouri's communities, the nation, and international partners by:

- Creating a culture of collaborative relationships in research, education, and service to generate innovative ideas and solutions;
- Providing professional health management and informatics education and fostering lifelong learning;
- Delivering technical assistance and consultation by partnering with health, human service, and policy-making organizations; and
- Developing innovative commercial products and services for health- and education-related applications.

### Faculty

**Professor** E. J. Simoes\*\*, L. L. Hicks\*\*, D. Wakefield\*\*  
**Associate Professor** S. A. Boren\*\*, J. W. Davis\*\*, N. Khatri\*\*, M. Popescu\*\*, I. Yoo\*\*  
**Assistant Professor** M. S. Kim\*, R. Leung\*, C. Rathert\*\*  
**Clinical Professor** K.D. Bopp\*, D. A. Fleming\*, G. M. Sill  
**Clinical Assistant Professor** W. G. Phillips\*, W. Wells\*  
**Clinical Instructor** P. E. Alafaireet\*, W. E. Meyer\*, D. E. Moxley\*  
**Associate Research Professor** J. Jackson-Thompson\*  
**Assistant Research Professor** G. F. Petroski\*  
**Adjunct Professor** A. Grant  
**Adjunct Assistant Professor** C. Bryan, S. Riley  
**Adjunct Clinical Instructor** M. Harris  
**Adjunct Instructor** K. Lobenstein  
**Professor Emeritus** G. D. Brown\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in Health Informatics, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

- MS in Health Informatics and Bioinformatics (p. 610)
- Graduate Certificate in Health Informatics (p. 612)

### About the Master of Science in Health Informatics

The program prepares professionals to meet critical and complex challenges in applying information technology within the health industry. It provides recognized national and global leadership in health informatics education.

The residential master's degree prepares students for careers in developing and evaluating clinical information systems, data and knowledge management, decision support, and doctoral study in health informatics. The executive master's degree advances the careers of physicians, managers, nurses, information system designers, consultants, entrepreneurs, and others committed to the application of information technology for improving the quality, safety, and efficiency of health services.

The program admits diverse cohorts of students from Missouri, other states, and other nations. During the admissions process, the program seeks learners with strong academic records, maturity, motivation, leadership capabilities, and career potential. Primary post-graduation placements include doctoral programs, health systems, hospitals, academic medical centers, physician group practices, outpatient facilities, information technology companies, consulting firms, government agencies, insurance entities, and other points of health services delivery.

Whereas the residential master's degree format is a traditional on-campus residential program, the executive master's degree is offered in a hybrid model featuring both on-campus and distance learning. In both formats, emphasis is on fostering an individualized and collaborative culture of learning, mentoring, and professional development among students, faculty, staff, alumni, and other practitioners. The intent is to prepare students to enable transformational leadership and improve patient care quality, safety, value, and overall level of population health.

### Graduate

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## MS in Health Informatics and Bioinformatics

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### Admission Contact Information

Veronica Kramer (KramerV@health.missouri.edu) or hmi-admissions@health.missouri.edu  
CE 707, Clinical Support and Education Building, DC006.00  
One Hospital Drive  
Columbia, MO 65212  
573-884-0698

### Residential MS(HI) Program

The residential MS in Health Informatics curriculum includes 36 credit hours of health informatics course work, as well as three credit hours of foundation courses that must be waived or completed, and an additional six credit hours of highly recommended foundation courses. The health informatics curriculum is comprised of (a) three credit hours of health

informatics introduction, (b) 18 credit hours of core courses, (c) selected concentration courses of at least six credit hours, and (d) nine credit hours of research courses. The curriculum integrates learning across computer science, health informatics, and health services management. The program also develops students' research interests in health informatics and encourages those with excellent academic performance to pursue the PhD degree. To graduate, a student must maintain a GPA of 3.0 (A=4.0) or better.

Individuals with three or more years of professional experience are encouraged to apply to the Executive HI Program.

### Admission Criteria

Deadline for Fall entrance: Rolling

- A minimum of a baccalaureate degree from an accredited institution
- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	603

- Minimum Academic IELTS scores:

Item	Score
OVERALL	7.5

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative
Prior to August 1, 2011	50th percentile
On or After August 1, 2011	50th percentile

- In lieu of GRE, minimum GMAT score: 50th percentile
- Undergraduate GPA: 3.0 during the last 60 hours of undergraduate course work and any subsequent graduate course work

### Required Application Materials

To the Graduate School:

All required Graduate School documents

To the HMI Program (CE 707 Clinical Support & Edu. Bldg, DC006.00, Columbia, MO 65212):

3 letters of recommendation

GRE or GMAT scores

Current resume or curriculum vitae

Personal essay

Official transcripts

TOEFL report (international applicants only)

### Financial Aid from the Program

Students admitted to the MSHI program are automatically considered for merit-based scholarships. A list of scholarships available through the Department as well as external scholarships and other sources of aid is available at: [http://hmi.missouri.edu/prospective/financial\\_aid.html](http://hmi.missouri.edu/prospective/financial_aid.html). A limited number of Graduate Research Assistantship (GRA) positions, which include a full tuition waiver, are available within the HMI Department. All incoming and current students receive consideration and the Department awards GRAs based on merit, the availability of project funding, and alignment of student and faculty research interests and skills. All admitted students who are not Missouri residents are considered for Out-of-state fee waivers, which include a \$1,000 scholarship and waive nonresident fees. Applicants admitted on

probation are not eligible for GRAs, fee waivers, or scholarships until they attain a 3.0 GPA.

### Sample Plan of Study for the MSHI Degree:

First Year					
Fall	Credits	Spring	Credits	Summer	Credits
HMI 7430	3	HMI 8441	3	HMI 8689 *	3
HMI 8435	3	HMI 8478	3		
HMI 8870	3	HMI 8443	3		
STAT 7020, 7150, or 7510	3	CMP_SC 3380 (Foundation Course)#	3		
	12		12		3
Second Year					
Fall	Credits	Spring	Credits		
HMI 8437	3	HMI 8450	3		
HMI 8573	3	HMI 8571	3		
HMI 8610	3	HMI 8090	3		
	9		9		
Total Credits: 45					

# Credit hours taken for foundation courses as part of the MSHI program do not count toward the credit hours required for the degree.

\* HI students are not required to complete a summer internship but may elect to complete one if they wish. If a student chooses to complete an internship, s/he must register for HMI 8689 and must abide by all internship program requirements.

### Executive MS(HI) Program

In addition to the traditional degree program, an alternative format program is offered for professionals who have significant experience in health informatics. The executive MS program in Health Informatics, which begins in January, combines 3 on-campus weekend sessions per semester with independent study and online interaction in an innovative 2-year course of study. For additional information about the Executive MS Health Informatics Program, please call the coordinator of student recruitment at (573) 884-0698, or visit <http://hmi.missouri.edu>

### Doctor of Philosophy in Informatics, emphasis Health Informatics

(Degree administered by the MU Informatics Institute)

### Contact Information

University of Missouri Informatics Institute  
 573-882-9007  
 email [muigraduateprogram@missouri.edu](mailto:muigraduateprogram@missouri.edu)  
 web: <http://mii.missouri.edu>

The University of Missouri also offers a PhD in Informatics with Health Informatics as an emphasis area. Thus, official transcripts of students who complete this doctoral program will reflect both the degree (Informatics) and the emphasis area (Health Informatics).

The doctoral program in informatics draws on the considerable resources and strengths of our department along with other academic programs at the University of Missouri. The benefit to students: a rigorous yet flexible program of study. For example, courses may include statistics, computer science, health systems, clinical informatics, consumer health informatics, public health informatics, program evaluation, information architecture, decision support and knowledge systems, and biomedical data/text mining. The integrated doctoral program assures broad exposure to the field and fosters new insights and innovative research concepts.

HMI 8443	Enterprise Information Architecture	3
HMI 8571	Decision Support in Health Care Systems	3

## Careers

The US government predicts that employer demand will remain high for individuals with skills in health and clinical informatics. Mizzou students acquire the skills necessary to establish careers at the forefront of health informatics. This program is ideal for students who aspire to become researchers and thought leaders. Specific career paths may include health research; collegiate informatics teaching faculty; health informatics managers. Job sectors span government, medicine, health professions, and private, nonprofit and public research institutions.

## About MUII

Building on a tradition of outstanding informatics education and research at Missouri, the MU Informatics Institute is an interdisciplinary research and education program supported by 38 core faculty members from 14 departments and six colleges/schools, such as the College of Engineering; School of Medicine; School of Nursing; College of Arts and Sciences; College of Agriculture, Food & Natural Resources; and College of Education. The Institute, under the Governance of the Graduate School, offers a doctoral degree program with concentrations in bioinformatics and health informatics. Each concentration stresses the skill sets and research appropriate for the subfield within the broad area of informatics. Students are accepted into the program with diverse backgrounds and varying degrees of experience.

## Learn more or apply

Prospective doctoral students can contact MUII [muiigraduateprogram@missouri.edu](mailto:muiigraduateprogram@missouri.edu) or visit their web site <http://muii.missouri.edu> or call 573-882-9007

## Graduate Certificate in Health Informatics

The Graduate Certificate in Health Informatics offered by the Department of Health Management and Informatics provides learners with the skills necessary to participate in the selection, use, and evaluation of information technology applications throughout the health services industry. The certificate program is designed for physicians, nurses, managers, information system designers, consultants, and others committed to the application of information technology for improving the quality, safety, and efficiency of health services.

Students enrolled in the MHA degree program may earn an HI Certificate in addition to their Master's degree. The HI Certificate requires the completion of the following four courses (a total of 12 credit hours):

HMI 7430	Introduction to Health Informatics	3
HMI 8435	Information Security, Evaluation and Policy	3

## Informatics

Academic doctoral programs at MU in the area of Informatics are coordinated through the Informatics Institute.

muiigraduateprogram@missouri.edu  
241 Engineering Building West  
Columbia, MO 65211-2060  
573-882-9007  
<http://muii.missouri.edu/>

### About the Informatics Institute (MUII)

Building on a tradition of outstanding informatics education and research at Missouri, the MU Informatics Institute is comprised of over 40 faculty from 16 different departments and 8 schools/colleges, including the Colleges of Agriculture, Food, and Natural Resources; Arts & sciences; Education; Engineering; Veterinary Medicine; and the Schools of Health Professionals; Medicine; and Nursing. The Institute offers emphasis areas in bioinformatics and health informatics, along with a concentration area in geoinformatics. Each emphasis area and concentration area stress skill sets and research appropriate to the subfield within the broad area of informatics. A core curriculum provides all students with a foundation of knowledge and tools in biology, computer sciences, health systems, and statistics, after which they complete further coursework in their chosen area. The integrated program assures broad exposure to the field and fosters new insights and innovative research concepts.

### Faculty

**Professor** S. Chen (<https://muii.missouri.edu/index.php?pid=12&person=553>)\*\*, S. Erdelez (<https://muii.missouri.edu/index.php?pid=12&person=561>)\*\*, K. Hagglund (<https://muii.missouri.edu/index.php?pid=12&person=568>)\*\*, H. He (<https://muii.missouri.edu/index.php?pid=12&person=578>)\*\*, L. Hicks (<https://muii.missouri.edu/index.php?pid=12&person=385>)\*\*, S. S. Nair (<https://muii.missouri.edu/index.php?pid=12&person=533>)\*\*, C.R. Shyu (<https://muii.missouri.edu/index.php?pid=12&person=1>)\*\*, M. Sievert\*\*, E. Simoes (<https://muii.missouri.edu/index.php?pid=12&person=565>)\*, D. Wakefield (<https://muii.missouri.edu/index.php?pid=12&person=15>)\*\*, D. Xu (<https://muii.missouri.edu/index.php?pid=12&person=7>)\*\*  
**Associate Professor** G. L. Alexander (<https://muii.missouri.edu/index.php?pid=12&person=532>)\*\*, S. A. Boren (<https://muii.missouri.edu/index.php?pid=12&person=8>)\*\*, J. Bryan (<https://muii.missouri.edu/index.php?pid=12&person=576>), J. Cheng (<https://muii.missouri.edu/index.php?pid=12&person=2>)\*\*, J. W. Davis (<https://muii.missouri.edu/index.php?pid=12&person=419>)\*\*, G. DeSouza (<https://muii.missouri.edu/index.php?pid=12&person=571>), Y. Duan (<https://muii.missouri.edu/index.php?pid=12&person=558>)\*\*, Christine Elsik (<https://muii.missouri.edu/index.php?pid=12&person=575>)\*\*, T. Kazic (<https://muii.missouri.edu/index.php?pid=12&person=4>)\*\*, J. Moore (<https://muii.missouri.edu/index.php?pid=12&person=564>)\*\*, J. C. Pires (<https://muii.missouri.edu/index.php?pid=12&person=158>)\*\*, M. Popescu (<https://muii.missouri.edu/index.php?pid=12&person=10>)\*\*, G. K. Springer (<https://muii.missouri.edu/index.php?pid=12&person=6>)\*\*, M. Wang (<https://muii.missouri.edu/index.php?pid=12&person=566>)\*, I. Yoo (<https://muii.missouri.edu/index.php?pid=12&person=11>)\*\*, X. Zou (<https://muii.missouri.edu/index.php?pid=12&person=3>)\*\*  
**Assistant Professor** M. Becchi (<https://muii.missouri.edu/index.php?pid=12&person=569>)\*\*, G. C. Conant (<https://muii.missouri.edu/index.php?pid=12&person=417>)\*\*, P. Cornish (<https://muii.missouri.edu/>

[index.php?pid=12&person=567](https://muii.missouri.edu/index.php?pid=12&person=567))\*\*, S. Goggins (<https://muii.missouri.edu/index.php?pid=12&person=577>)\*\*, M. S. Kim (<https://muii.missouri.edu/index.php?pid=12&person=557>)\*\*, D. Korkin (<https://muii.missouri.edu/index.php?pid=12&person=5>)\*\*, R. Leung (<https://muii.missouri.edu/index.php?pid=12&person=572>)\*\*, T. Matisziw (<https://muii.missouri.edu/index.php?pid=12&person=562>)\*\*, C. Rathert (<https://muii.missouri.edu/index.php?pid=12&person=544>)\*\*,

**Associate Research Professor** J. Jackson-Thompson (<https://muii.missouri.edu/index.php?pid=12&person=573>)\*\*

**Assistant Research Professor** G. Arthur (<https://muii.missouri.edu/index.php?pid=12&person=551>)\*\*, S. Givan\*\*, M. Klaric (<https://muii.missouri.edu/index.php?pid=12&person=570>)\*\*, R. Schnabel (<https://muii.missouri.edu/index.php?pid=12&person=574>)\*\*

**Associate Clinical Professor** W. Phillips (<https://muii.missouri.edu/index.php?pid=12&person=12>)\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

## Undergraduate

While MU does not offer undergraduate degrees specifically in informatics, the University does offer baccalaureate opportunities in a number of related areas. Many successful informatics students have received bachelor's degrees in Geography, Computer Science, Statistics, Business, Biology, and Biochemistry before starting their doctorate.

In addition, MUII offers several service courses designed for upper-level undergraduates and master's students to expose students to the fundamentals of bioinformatics.

## Graduate

- PhD in Informatics (p. 614)

### Emphasis Areas & Concentration Areas

MUII offers a doctoral degree (PhD) in two emphasis areas: bioinformatics and health informatics. In addition, students may also opt for a doctoral degree with a concentration area in geoinformatics.

Students with areas of interests outside of informatics may also wish to pursue a collaborative degree program between MUII and other degree programs. The purpose of the collaborative degree program is to allow students the opportunity to obtain advanced degrees in fields that complement the study of informatics and expand the student's knowledge and applicability.

MUII students may also select the collaborative degree between the Master of Public Health program and MUII PhD in Informatics program. Students must be accepted by both MUII and the MPH program to be eligible. Upon completion of the PhD requirements for the Informatics Institute and degree requirements for the MPH in Health Promotion and Policy with Focus on Informatics, students will receive both the PhD in Informatics and MPH degrees. For a full list of courses for the MPH in Health Promotion and Policy with Focus on Informatics, please visit the MPH program website (<http://publichealth.missouri.edu/html>).

## Resources and Facilities

The Institute is located in multiple locations on MU campus with well-equipped laboratories containing state-of-the-art instrumentation and computing facilities for informatics research. Major instrumentation includes a Dell EM64T cluster system with 512 processors, an SGI Altix BX2 SMP server with 64 Itanium2 processors, IBM iDataPlex high-performance computing system, and a number of DELL servers with multiple quad-core processors for computational researches.

## Faculty Areas of Research Interest

Faculty research covers a wide range of interests including structural bioinformatics, systems biology, cancer informatics, chemical informatics, epigenomics, phenomics, text mining & understanding, electronic health records, evidence-based medicine, personalized medicine, human-computer interactions in health care, consumer informatics, patient safety, public health informatics, geospatial informatics, information retrievals, biomedical data mining & knowledge discovery, and machine learning. For a list of faculty members and their research areas, please visit our web page (<http://muii.missouri.edu/index.php?pid=1/#1>).

MUII recently launched four new research initiatives in Clinical Informatics, Big Data, Personalized Medicine, and Next Generation Sequencing, all of which have created opportunities for graduate research positions. For more information, please see the MUII website (<http://muii.missouri.edu/index.php?pid=40>).

## Internal Funding

Fellowships and research/teaching assistantships are available for highly qualified applicants. Application information is available on the Institute's website (<http://muii.missouri.edu/index.php?pid=14>).

## Graduate

### PhD in Informatics

#### Admission Contact Information

MUII Staff (mailto: [muiiadmissions@missouri.edu](mailto:muiiadmissions@missouri.edu))  
 241 Engineering Building West  
 Columbia, MO 65211-2060  
 Phone: 573-882-9007  
 FAX: 573-884-8709  
 Informatics Institute (MUII) website: <http://muii.missouri.edu/>

#### Admission Criteria

Fall deadline: The deadline for Fall admission is March 1. However, to be considered for departmental and Graduate School fellowships and assistantships, applications should be submitted by January 15th.

- Preferred GPA: 3.3 out of 4.0
- Preferred GRE scores<sup>\*</sup>:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	1200	1200	3.5-4.0
On or After August 1, 2011	309	309	3.5-4.0

<sup>\*</sup> or a preferred GMAT score of 570

- Preferred TOEFL scores<sup>\*\*</sup>:

Internet-based test (iBT)	Paper-based test (PBT)
90	577

<sup>\*\*</sup> or a preferred IELTS score: 6.0

- Sufficient background and training to pursue advanced degree in informatics

## All Required Documents

All students are required to apply through the Graduate School's on-line process. To begin your application, please see the ApplyYourself website (<http://gradschool.missouri.edu/admissions/apply>).

1. Curriculum Vitae
2. Statement of Purpose, which should include a summary of why the applicant is interested in pursuing an advanced informatics degree, a brief description of your previous research experiences, the specific area of informatics you are interested in pursuing, and your future career goals and plans in the informatics field.
3. GRE/GMAT scores
4. TOEFL/ELTS scores for international applicants, if required.
5. Three letters of recommendation from faculty or supervisors who can evaluate the applicant's credentials and potential to become successful in the area of informatics.
6. Official transcripts from each college and university you have attended:  
 Official transcripts must be sent from each institution directly to the Graduate School.

## Optional Documents

Applicants are encouraged to submit representative publications in informatics, if available.

## Informatics Doctoral Degree Requirements

The following is a brief synopsis of the general degree requirements; please see the Informatics Institute web site (<https://muii.missouri.edu/index.php?pid=37>) for complete details:

- Students must take required and area courses
- Students must pass a qualifying examination
- Students must present at least one institutional seminar annually
- Students are required to complete a comprehensive exam, which includes written and oral elements, within a specified time frame
- Students must pass a comprehensive examination at least 7 months before their scheduled defense
- Students must submit and defend a dissertation describing the results of successful and original research in one of the branches of informatics.
- To show research progress, students are expected to be working toward presenting at conferences and publishing in peer-reviewed journals based on their informatics research.

## Medical Pharmacology and Physiology

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Pharmacology and Physiology  
School of Medicine  
MA415 Medical Sciences Building  
573-882-4957  
<http://medicine.missouri.edu/mpp/>

The joining of these two disciplines provides a powerful way to address modern questions of biology.

The department offers MS and PhD degree programs in Pharmacology and Physiology. These programs are designed to prepare students for rewarding teaching and/or research careers in academia, government or the pharmaceutical and biotechnical industries.

### Faculty

**Professor** E. Blaine\*, F. Booth\*\*, D. Bowles\*\*, G. Davis\*\*, M. Davis, K. Dellsperger\*\*, N. Dietz, W. Durante\*\*, W. Fay\*\*, C. Hardin, E. Hasser\*\*, M. Hill\*\*, L. Holland\*\*, T. Hurley\*, V. Huxley\*\*, T. Hwang\*\*, J. Ibdah, R. Korthis\*\*, M. H. Laughlin\*, K. McDonald\*\*, G. Meininger\*\*, M. Milanick\*\*, M. Rovetto\*\*, S. Segal\*\*, S. Shukla\*\*, J. Sowers\*\*, R. Terjung\*\*  
**Associate Professor** D. Bowles\*\*, K. Byington\*, V. Demarco\*, P. Fadel\*\*, K. Gillis\*\*, S. Halenda\*, M. James-Kracke\*, J. Lever\*\*, L. Martinez-Lemus\*\*, R. Lim\*\*, A. Parrish#, P. Wilden\*\*  
**Assistant Professor** C. Baines, T. Domeier\*, M. Krenz\*\*, L. Martinez-Lemus\*\*, L. Polo-Parada\*\*, J. Smith, G. Sowa\*\*, M. Thakkar\*\*  
**Professor Emeritus** D. Blount\*, E. L. Forker\*, L. Forte\*, R. Freeman\*, A. Jones\*, H. D. Kim\*, R. Russell\*, J. Turner, R. Walkenbach\*, W. Wosilait\*, M. Zatzman\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in medical pharmacology and physiology, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

Monica Elliott  
School of Medicine  
MA415 Medical Sciences Building  
573-882-4957  
<http://medicine.missouri.edu/mpp/>

- MS in Medical Pharmacology and Physiology (p. 616)
- PhD in Medical Pharmacology and Physiology (p. 616)

The joining of these two disciplines provides a powerful way to address modern questions of biology. The department offers MS and PhD degree programs in Pharmacology and Physiology. These programs are designed to prepare students for rewarding teaching and/or research careers in academia, government or the pharmaceutical and biotechnical industries.

### Pharmacology

Pharmacology is a basic medical science that deals with actions of drugs, hormones and neurotransmitters on living processes. Knowledge based on the results of pharmacological research leads to increased effectiveness and safety in the treatment of diseases in man and animals. Pharmacology is different from pharmacy, which is a profession concerned with the preparation and dispensing of drugs.

### Physiology

The discipline of Physiology focuses on understanding the integrative function of living organisms from the molecular to the organismal level. As such, physiological research addresses how genes, organelles, cells, tissues and organs are integrated to accomplish the complex functions of living organisms. From a medical perspective, understanding normal function is a prerequisite to understanding disease.

### Areas of Study

Regardless of their final degree objectives, students admitted into the departmental graduate programs will participate in a core curriculum during the first year and choose a specific tract leading to either a degree in Pharmacology or in Physiology following successful completion of the first year. The department also offers specially designed curriculum for individuals interested in a combined MD/graduate degree or who have previous relevant medical education.

### Departmental Research

The departmental faculty has expertise in a variety of mammalian systems, with emphases in cardiovascular and endocrine physiology and molecular and cellular pharmacology. Individual labs utilize a number of different experimental models ranging from the whole animal studies to cellular, subcellular, biochemical and modern molecular approaches. Human research is also emphasized.

Research problems under current investigation include microvascular control of blood flow; modulation of vascular function by the extracellular matrix; role of the microcirculation in inflammation and diabetes; mechanisms involved in angiogenesis membrane regulation and ion transport; barriers separating circulating blood and tissue; energetics and metabolism of vascular smooth and cardiac muscle; electrophysiology of isolated cardiac vascular smooth muscle and endothelial cells; exercise physiology and regulation of contractile protein functions; and hormonal induction of genetic transcription, intracellular signaling mechanisms and genetic regulation of cell proliferation, cell cycle, cell differentiation and apoptosis; and the pathogenetic mechanisms of alcohol on liver cells.

### Partnerships

Cooperative interactions exist with other clinical and basic science departments in the School of Medicine as well as with the Truman Veterans Hospital, the Dalton Cardiovascular Research Center, the College of Veterinary Medicine, Nutrition and Exercise Department and various campus-wide programs in Molecular Biology and Food for the

21st Century. The cooperative research atmosphere encourages staff and students to work across departmental lines and provides a unique opportunity for interdisciplinary training of the students.

## Teaching Experience

In addition to course work and research training, all graduate students are required to participate as teaching assistants in laboratory or lecture instruction offered by the department. Such experience enhances the students' presentation and teaching skills, contributes to their professional maturity, and reinforces a sense of collegiality between students and faculty.

## Financial Aid from the Program

Financial support in this program for qualified graduate students is available from several sources. Students also may be eligible for institutional teaching and research assistantships. In addition, there are a number of fellowship awards from the Graduate School and the campus-wide Life Science Program available on a competitive basis through nominations by the Department.

Deadlines for these fellowships are January to mid-February each year. Applicants do not directly apply for these fellowships. Rather the department applies on behalf of successful applicants for admission. Therefore a prospective candidate should submit an application for admission to the department in the preceding fall. Finally, some of our students are supported by research grants of individual faculty members or by predoctoral fellowships from extramural sources.

## Graduate

### MS in Medical Pharmacology and Physiology

#### Admission Contact Information

Monica Elliott  
 MA415 Medical Sciences Bldg, DCO63.00  
 Columbia, MO 65211Z  
 573-882-4957

#### Application Deadlines

Fall deadline: December 15  
 Spring deadline: August 15

#### Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum IELTS overall academic score: 5.5
- Minimum GPA: 3.0 in the last 60 hours
- Bachelor's degree in chemistry, biology, pharmacy or related areas from an accredited college
- Background in biology and chemistry and an understanding of mathematics and physics
- Course work in biochemistry and physiology is highly recommended.
- Previous lab or research experience preferred

Students are usually admitted to begin their program in the Fall semester, but applications for admission in other semesters will be considered on a space-available basis. Women and minorities are encouraged to apply.

Students with an appropriate educational background are encouraged to apply for entrance into the PhD program. A master's degree is not a prerequisite for admission to the doctoral program. The department will consider applications for the MS degree programs from U.S. citizens but PhD degree students will be given priority consideration for financial support. Deficiencies in course work may be remedied during the first years of the graduate program.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Medical Pharmacology & Physiology Program:*

- Departmental application
- Personal statement
- Transcripts
- 3 letters of recommendation (use form provided). The letters should be written by individuals knowledgeable of the student's academic capability.
- Official GRE & TOEFL scores

## Degree Requirements

To satisfy requirements for the MS degree, a student must complete the professional plan of study with an average grade of B or better and pass an oral examination over an acceptable master's thesis. Candidates also must comply with other regulations governing master's degrees.

## Length of Study

MS degree students should normally complete their studies and thesis project within 2-3 years of admission to the degree program.

### PhD in Medical Pharmacology and Physiology

#### Admission Contact Information

Monica Elliott  
 MA415 Medical Sciences Bldg, DCO63.00  
 Columbia, MO 65211Z  
 573-882-4957

#### Application Deadlines

Fall deadline: December 15  
 Spring deadline: August 15

#### Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
61	500

- Minimum IELTS overall academic score: 5.5
- Minimum GPA: 3.0 in the last 60 hours
- Bachelor's degree in chemistry, biology, pharmacy or related areas from an accredited college



- Background in biology and chemistry and an understanding of mathematics and physics
- Course work in biochemistry and physiology is highly recommended.
- Previous lab or research experience preferred

Students are usually admitted to begin their program in the Fall semester, but applications for admission in other semesters will be considered on a space-available basis. Women and minorities are encouraged to apply.

Students with an appropriate educational background are encouraged to apply for entrance into the PhD program. A master's degree is not a prerequisite for admission to the doctoral program. The department will consider applications for the MS degree programs from U.S. citizens but PhD degree students will be given priority consideration for financial support. Deficiencies in course work may be remedied during the first years of the graduate program.

## Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the Medical Pharmacology & Physiology Program:*

- Departmental application
- Personal statement
- Transcripts
- 3 letters of recommendation (use form provided). The letters should be written by individuals knowledgeable of the student's academic capability.
- Official GRE & TOEFL scores

## Plan of Study

The PhD plan of study includes at least two years of basic and advanced courses in physiology and/or pharmacology, as well as courses in cell and molecular biology. The students also will be trained in conducting physiological and pharmacological research in the laboratory of individual faculty members during the first year.

## Qualifying Examination Policy

The department does not require a formal qualifying examination. Successful completion of the core curriculum and satisfactory performance in conducting scientific research and teaching will qualify students for continuation in the PhD program.

## Choosing a Track and Mentor

The student will choose a dissertation mentor at or before the end of the first year and decide whether they wish to pursue the doctoral program in Pharmacology or Physiology.

## Comprehensive Examination

All PhD program students must pass a comprehensive examination before the end of the first semester of the third year of enrollment. The usual format of the comprehensive exam includes the writing and oral defense of a research proposal outside of the student's dissertation research area.

## Dissertation

Each student must then carry out a dissertation research project, original in nature, which is expected to contribute significant new knowledge to the area of study. To facilitate this process, each student submits

a dissertation research proposal within six months of passing the comprehensive examination.

## Oral Defense

Finally, all PhD candidates must pass an oral defense of the dissertation and comply with all university and departmental regulations governing the PhD degree.

## Length of Study

The doctoral program normally requires four to five years beyond the baccalaureate degree.

## Microbiology and Immunology

School of Medicine  
M616 Medical Sciences Building  
573-882-8152  
<http://medicine.missouri.edu/mmi/>

The Department of Molecular Microbiology & Immunology (MMI), in partnership with the faculty from the Department of Veterinary Pathobiology (VPB), offers a comprehensive graduate program leading to the Doctor of Philosophy (Ph.D.) degree. This program provides individualized training that is strongly oriented toward basic research in molecular and cellular biology, microbiology, pathogenesis, immunology and host-parasite interactions. MMI offers:

- PhD in Microbiology
- Cooperative Degrees: MD and PhD in Microbiology & Immunology (Medicine)
- Interdisciplinary Area Program: PhD in Genetics Area Program

**Note:** The Department is not accepting students into the master's program.

### Faculty

#### Molecular Microbiology and Immunology

**Professor** K. L. Bennett\*\*, D. Duan\*\*, M. McIntosh\*\*, M. L. Misfeldt\*\*, D. J. Pintel\*\*, H. Zaghouani\*\*

**Associate Professor** D. Burke\*\*, J. F. Cannon\*\*, M. Johnson\*\*, D. R. Lee\*\*, S. Liu\*\*, S. Sarafianos\*\*

**Assistant Professor** M. R. Baldwin\*\*, M. A. Daniels\*\*, E. Teixeira-Pernas\*\*

**Professor Emeritus** R. A. Finkelstein, K. S. Wise\*\*

**Assistant Teaching Professor** J. L. Furrer

**Teaching Professor** L. S. Thai

#### Veterinary Pathobiology

**Professor** C. R. Brown\*\*, C. L. Lorson\*\*, B. K. Ray\*\*, G. Stewart\*\*

**Associate Professor** B. T. Beerntsen\*\*, M. J. Calcutt\*\*, C. L. Franklin\*\*, R. W. Stich\*

**Assistant Professor** D. Anderson\*, G. Zhang\*

#### Jointly appointed to Molecular Microbiology and Immunology

**Professor** H. Braley-Mullen\*\*, J. D. Wall\*\*

**Associate Professor** U. Atasoy\*\*

**Assistant Professor** B. Hahm\*\*, S. C. McKarns\*\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in molecular microbiology and immunology, the University does offer baccalaureate

opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

School of Medicine  
M616 Medical Sciences Building  
573-882-8152  
<http://medicine.missouri.edu/mmi/>

- PhD in Microbiology (p. 619)

The department is built around scholarly activities with three important missions: cutting-edge research programs to address relevant biomedical problems in microbiology and immunology, a graduate training program to educate strong, independent research scientists, and a commitment to provide knowledge-based service to the state, national and international communities that will improve global understanding of the microbial world, infectious diseases and host immunity to infection. Graduate (and postgraduate) education programs offer the basic principles of microbiology, pathogenesis, and immunology as well as research training opportunities in the laboratories of established scientists with diverse research interests.

### Faculty Research

The program is equipped to support a wide range of research activities at the cutting edge of our diverse science. Faculty research activities focus on key problems in pathogenic microbiology, immunology, molecular biology, genetics and virology.

### Research Facilities and Resources

The research environment at MU with Colleges of Medicine, Veterinary Medicine, Agriculture, Engineering, and Arts and Sciences on one comprehensive campus fosters the development of interdisciplinary scientific interactions that enhance both research and training opportunities for faculty and students alike. The Bond Life Sciences Center represents such an interdisciplinary research enterprise and houses investigators from multiple colleges and departments, including MMI. Critical to the Department's interests in infectious diseases and immunity research, the recent construction of an NIH-funded Laboratory for Infectious Disease Research provides modern BSL3/ABSL3 containment research space and animal holding facilities for the investigation of highly infectious organisms and human select agents. This resource, and the Department's partnership with the Midwest Regional Center for Excellence in Biodefense and Emerging Infectious Disease Research, centered at Washington University in St. Louis, position MU in the national network of infectious disease research and training efforts. Please visit the MMI Web site (<http://medicine.missouri.edu/mmi/>) for additional information on MMI's access to state of the art facilities.

### Career Opportunities

Graduates completing this training are prepared to pursue challenging and rewarding professional careers that involve research and teaching at supervisory levels in both the academic and private sectors.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding

packages. Check the program Web site or ask the program contact for details.

## Graduate

### PhD in Microbiology (MED)

#### Admission Contact Information

Jana Clark  
573-882-3938  
mmi@missouri.edu

The Departments of Microbiology and Immunology in the Medical School and Veterinary Pathobiology in the Veterinary School have combined to offer a graduate program designed to prepare students for an advanced professional career in microbiology and immunology. Emphasis is placed on developing outstanding students for productive supervisory roles in universities and colleges, industry, government and research institutes. Enrollment is limited to those students who show evidence of potential for research.

#### Application Deadline

Fall deadline: January 15

#### Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
92	580

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1100	
On or After August 1, 2011	300	

- Minimum GPA: 3.0
- Bachelor's degree from an accredited college or university
- Courses in the following: biology; advanced courses in biochemistry and/or molecular biology are highly desirable; chemistry (quantitative or organic); physics; mathematics

The PhD degree is offered only to students who demonstrate a high level of specialized knowledge and clear evidence of research potential.

#### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents
- TOEFL score (if international applicant)

*To the MMI Program:*

- Departmental application ([https://mmi.missouri.edu/apps/grad\\_app](https://mmi.missouri.edu/apps/grad_app))
- 3 letters of recommendation from individuals competent to comment on the applicant's potential for graduate work
- GRE scores
- Personal statement
- Copy of TOEFL scores (if international applicant)

#### Research & Teaching Assistantships

Students in the doctoral program are awarded research assistantships. Research assistants work with faculty members to obtain practical experience in carrying out research proposals through the collection of research data and writing research reports. All students in the graduate program are required to participate as teaching assistants for two semesters during their graduate studies.

#### Degree Completion Requirements

To be accepted for candidacy into the PhD program in microbiology & immunology, all applicants must perform satisfactorily in a core curriculum that includes advanced-level courses in the sub disciplines of immunology, molecular biology and microbial pathogenesis. Under the guidance of a doctoral program committee, a course of study is individually designed to fit each student's academic background, experience and objectives. Interdisciplinary courses in biochemistry, molecular and cellular biology and genetics provide breadth and balance in the program and enhance the student's research abilities. In addition, the PhD program consists of the following:

- Practical experience in teaching
- Successful completion of a comprehensive examination that tests the student's ability to develop an original scientific hypothesis and devise a feasible research plan that will test the hypothesis.
- A demonstration of research and writing ability by completing a scholarly dissertation on an approved research problem that results in the contribution of significant new knowledge. The final examination primarily covers this dissertation research.

## Neuroscience

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Nila Emerich emerichn@missouri.edu  
218 Tucker Hall  
Columbia, MO 65211  
573-882-1847  
<http://www.neurosci.missouri.edu/program.html>

### About the Program

One of the most exciting and dynamic fields of modern science worldwide is neuroscience, the study of how the nervous system is organized and how it functions. The field of neuroscience encompasses many disciplines, including biology, biochemistry, computer sciences, electrical engineering (neural modeling of neural networks and biomedical instrumentation), neurology, neurosurgery, pharmacology, physics, physiology, psychology, psychiatry, and radiology. Neuroscientists have advanced our understanding of nervous system development, neural function, injuries of the nervous system, and disease processes. At MU, neuroscientists investigate the molecular and cellular organization of the nervous system, the structure and function of neural systems (including vision and hearing), behaviors generated by the nervous system, and neurological diseases and disorders.

### Degrees

MS and PhD degrees are available.

### Faculty

**Professor** A. Chandrasekhar, N. Cowan, D. Geary, C. Gerhardt, K. Gillis, M. Hannink, C. Heesch, T. C. Hwang, P. Jen, G. Johnstone, M. Katz, M. Kirk, A. McClellan, S. Nair, D. O'Brien, J. Rouder, T. Schachtman, S. Shukla, G. Sun, G. Weisman

**Associate Professor** B. Bartholow, D. Beversdorf, D. Cornelison, M. Garcia, S. Hackley, J. Kerns, G. Kracke, J. Lee, C. Lorson, J. Maruniak, D. Miller, M. Pettris, H. Schatten, J. Schul, D. Schulz, T. Zars

**Assistant Professor** K. Aldridge, S. Christ, S. Ding, Z. Gu, M. Iyer, D. Kline, C. Kuehl-Kovarik, L. Reneker, M. Thakkar, M. Will

**Associate Research Professor** A. Simonyi

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in neuroscience, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

Nila Emerich emerichn@missouri.edu  
218 Tucker Hall

Columbia, MO 65211

573-882-1847

<http://www.neurosci.missouri.edu/program.html>

- MS in Neuroscience (p. 621)
- PhD in Neuroscience (p. 621)
- Graduate Certificate in Neuroscience (p. 621)

### About the Program

One of the most exciting and dynamic fields of modern science worldwide is neuroscience, the study of how the nervous system is organized and how it functions. The field of neuroscience encompasses many disciplines, including biology, biochemistry, computer sciences, electrical engineering (neural modeling of neural networks and biomedical instrumentation), neurology, neurosurgery, pharmacology, physics, physiology, psychology, psychiatry, and radiology. Neuroscientists have advanced our understanding of nervous system development, neural function, injuries of the nervous system, and disease processes. At MU, neuroscientists investigate the molecular and cellular organization of the nervous system, the structure and function of neural systems (including vision and hearing), behaviors generated by the nervous system, and neurological diseases and disorders.

Students interested in the program are encouraged to contact members of the faculty directly by phone or e-mail, or visit the Interdisciplinary Neuroscience Program website.

### Career Opportunities

MU's Interdisciplinary Neuroscience Program offers talented graduate students a chance to train for a career in one of the most exciting fields of modern science. Most of our students pursue research and teaching careers in basic neuroscience departments at prestigious research universities. Others opt for challenging and rewarding positions in applied fields, such as drug research or neurodiagnostic technology. Whatever their ultimate goals, the graduate neuroscientists who are trained at MU gain a solid understanding of the nervous system and of the experimental methods by which this knowledge is acquired.

### Plan of Study

Typical undergraduate majors that constitute preparation for graduate work in neuroscience include, but are not limited to, biochemistry, engineering, biology, computer science, chemistry, physics, neurobiology, physics and psychology.

After completing comprehensive course work in molecular, cellular, systems and behavioral neuroscience, graduate students join a research laboratory and work with other lab personnel to master the relevant technical skills and theoretical concepts in their chosen field. Students in the Interdisciplinary Neuroscience Program have the opportunity to present their findings at lab meetings, seminars, journal club sessions, and both national and international professional scientific conferences.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Graduate

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## MS in Neuroscience

### Admission Criteria

Fall deadline: January 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1200	
On or After August 1, 2011	308	

- Bachelor's degree or its equivalent

Neuroscience comprises a united field that integrates across many disciplines, and students from a variety of academic backgrounds are encouraged to apply to the Interdisciplinary Neuroscience Program (INP). U.S. residents and international applicants are strongly encouraged to apply.

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the INP Program:*

- Departmental application
- 3 letters of recommendation
- GRE scores
- TOEFL (if applicable)

## PhD in Neuroscience

### Admission Criteria

Fall deadline: January 15

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal + Quantitative	Analytical
Prior to August 1, 2011	1200	
On or After August 1, 2011	308	

- Bachelor's degree or its equivalent

Neuroscience comprises a united field that integrates across many disciplines, and students from a variety of academic backgrounds are encouraged to apply to the Interdisciplinary Neuroscience Program (INP). U.S. residents and international applicants are strongly encouraged to apply.

### Required Application Materials

*To the Graduate School:*

- All required Graduate School documents

*To the INP Program:*

- Departmental application
- 3 letters of recommendation
- GRE scores
- TOEFL (if applicable)

## Graduate Certificate in Neuroscience

The purpose of this certificate is to provide formal recognition to post baccalaureate students who are taking neuroscience courses and conducting research in neuroscience laboratories. This stand-alone certificate would allow post-baccalaureate students to have a specific, formal indication of their advanced studies and would be very beneficial to students who are considering applying to graduate degree programs or health sciences programs, such as medical or dental school.

## Nutrition Area Program

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**Department Chair:**

Christopher Hardin  
340H Life Science Building  
(573) 882-4288  
hardinc@missouri.edu

**Director of Graduate Studies:**

Pamela Hinton  
124 McKee  
(573)882-4137  
hintonp@missouri.edu

**Admission Contact Information**

Tammy Conrad  
106 McKee  
Columbia, MO 65211  
573-882-1144  
conradt@missouri.edu

### About the Program

The Nutrition Area Program provides graduate training in the distinct core nutrition knowledge described by the Graduate Nutrition Education Committee of the American Society for Nutrition.

- Master of Science in Nutrition Area Program
- PhD in Nutrition Area Program

### Faculty

**Professor** C. D. Hardin\*\*, J.A. Kanaley\*\*

**Associate Professor** S. Ball\*\*, S. Gable\*\*, P. S. Hinton\*\*, C. A. Peterson\*\*, J. Thyfault\*\*

**Assistant Professor** P. M. Landhuis\*, H. Leidy\*\*, R. S. Rector\*\*, V. Vieira-Potter\*

**Teaching Associate Professor** D.E. Brigham\*

**Teaching Assistant Professor** M. Raedeke\*

**Joint Faculty** M. J. Petris\*\*, L. Pulakat\*\*

**Adjunct Faculty** F. W. Booth\*, K. L. Fritsche\*\*, L. Hillman\*, Jamal A. Ibdah\*\*, D. Lubahn\*\*, G.Y. Sun\*\*, G.A. Weisman\*\*

**Adjunct Instructor** J.B. Mann, L. Hudson, T. Roberts, J. Schnell, R. Sharp, D. Showers, D. Smith

**Extension Faculty** J. Britt-Rankin\*, A. Cohen, C. Gabel, E.R. Schuster

**Professor Emeritus** R. P. Dowdy\*, M. McDonald, B. L. O'Dell, T. R. Thomas\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in the nutrition area program, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and

Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

**Department Chair:**

Christopher Hardin  
340H Life Science Building  
(573) 882-4288  
hardinc@missouri.edu

**Director of Graduate Studies:**

Pamela Hinton  
124 McKee  
(573) 882-4137  
hintonp@missouri.edu

**Admission Contact Information**

Tammy Conrad  
106 McKee  
Columbia, MO 65211  
(573) 882-1144  
conradt@missouri.edu

- PhD in Nutrition Area Program (p. 623)

### About the Program

The Nutrition Area Program provides training in the distinct core nutrition knowledge described by the Graduate Nutrition Education Committee of the American Society for Nutrition: general research skills; structure and biochemical and metabolic functions of nutrients and other dietary constituents; food, diets, and supplements; nutritional status assessment; nutrition and disease; nutrition interventions and policies; and, analytical skills. Graduate students also receive training in laboratory research, seminar preparation and delivery, scientific writing, problem solving and research grant writing. Graduate study in nutritional sciences at the University of Missouri offers the advantage of interdisciplinary nutrition research that is facilitated via the many research centers at MU, including Food for the 21st Century (F21C), the Botanical Center, and the Life Sciences Center.

### Areas of Research

Nutrition is, by definition, an applied and multi-disciplinary science that integrates other disciplines such as biochemistry, physiology, biology, psychology, sociology, and economics. A primary research focus in the department of Nutrition and Exercise Physiology is the role of diet in the prevention and treatment of chronic diseases that are prevalent in the United States today: obesity, the metabolic syndrome, diabetes, immune disorders, neurodegenerative diseases, and osteoporosis. Specific dietary components being studied for their role in human health include protein, calcium, vitamin D, copper, iron, omega-3 fatty acids, and nutraceuticals. Another important research area is the determinants of eating behavior, including neuro-psychological, sociologic, and economic factors. Investigative approaches include epidemiology, clinical trials, human studies, experimental and transgenic animal models, and cultured cell models.

### Research Facilities

State-of-the-art facilities foster collaborative research across disciplines including Nutritional Sciences, Exercise Physiology, Biochemistry, Internal Medicine, Food Sciences, Biomedical Sciences, Animal

Sciences, Behavioral Sciences and Public Health. Research Centers at the University of Missouri include Dalton Cardiovascular Research Center, the Bond Life Sciences Center, the Interdisciplinary Center on Aging, the International Institute of Nano and Molecular Medicine, the Health Activity Center, the Botanical Center, the Brain Imaging Center, and the Bioinformatics Consortium. Core research facilities available to MU faculty are the Cell and Immunobiology,

DNA, Molecular Cytology, Electron Microscopy, Nuclear Magnetic Resonance, and Transgenic Animal cores. The Department of Nutrition and Exercise Physiology has a human exercise physiology lab, body composition assessment including BODPOD and DXA, as well as the MU Nutritional Center for Health that will house a metabolic kitchen and an observational food-choice behavior lab.

## Financial Aid from the Program

Assistantships are competitive and can be obtained in research, teaching, and community nutrition and fitness programs. Numerous scholarships also are available to attract incoming graduate students, including the Life Sciences Fellowship program.

## Graduate

### PhD in Nutrition Area Program

Director of Graduate Studies: Pamela Hinton

#### Admission Contact Information

Tammy Conrad [conradt@missouri.edu](mailto:conradt@missouri.edu)  
106B McKee; Columbia, MO 65211  
573-882-1144

Application Deadline

Fall admission: December 31 for the MS and PhD programs

### Admissions Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
100	600

- Minimum GRE scores:

When did you take the GRE?	Verbal	Quantitative	Analytical
Prior to August 1, 2011	200	500	3.5
On or After August 1, 2011	150	150	

- Minimum GPA: 3.0 in science and math classes

### Prerequisites

Entering students are expected to have undergraduate training (lecture and laboratory courses) in general and organic chemistry and biology, a two-semester course in biochemistry, and an upper-level human nutrition course.

### Required Application Materials

To the Graduate School

- All required Graduate School documents, including on line application

*Required Supplementary Application Materials* (upload online with your application to the Graduate School)

- Statement of Purpose: Upload a Statement of Purpose, indicating your academic/research interests and career goals to the "Supplemental Information" section of your online application.
- Resume or Vita: Upload a current Resume or Vita to the "Supplemental Information" section of your online application.
- Recommendations: Enter the required information for at least three recommenders in the "Recommendation" section of your online application. The recommenders will receive an email with instructions for completing and submitting your recommendation. Please ensure that the recommenders are aware of the February 1 application deadline.
- GRE Scores: Please make arrangements with Educational Testing Services to have official Graduate Record Exam (GRE) scores sent directly to our department. MU's Institutional code is 6875 and our department code: 0214.PhD Degree Completion Requirements

Requirements for the PhD degree in nutritional sciences include a mastery of the distinct core nutrition knowledge described by the Graduate Nutrition Education Committee of the American Society for Nutrition: general research skills; structure and biochemical and metabolic functions of nutrients and other dietary constituents; food, diets, and supplements; nutritional status assessment; nutrition and disease; nutrition interventions and policies; and, analytical skills.

### Required Courses:

NUTR_S 7340	Human Nutrition II Lecture	3
BIOCHM 7270 & BIOCHM 7272	Biochemistry and Biochemistry	6
NUTR_S 8340	Nutrition in Human Health	3
NUTR_S 8310	Nutritional Biochemistry of Lipids	3
AN_SCI 9442	Vitamins and Minerals	4
Statistics		6
NUTR_S 9087	Doctorate Seminar in Nutritional Sciences	1
NUTR_S 9090	Doctorate Research in Nutritional Sciences	1-99
Total Credits		27-125

A total of >72 hours beyond the bachelor's degree, including but not limited to courses from the following Emphasis Areas are required; courses from the Masters degree #30 h may be counted towards the doctoral degree at the discretion of the student's committee. At least 15 of the 72 hours of course work must be at the 8000/9000 level (exclusive of research, problems and independent study experiences). Graduate students may elect to take the suggested courses from the following emphasis areas within nutritional sciences. The emphasis areas are not degree programs, nor are the course lists all inclusive; rather, they serve to guide course selection.

### Emphasis Areas

#### Human/Clinical Nutrition

NUTR_S 7970	Sports Nutrition	2
NUTR_S 7950	Research in Dietetics	2
NUTR_S 7360	Nutritional Assessment	3
NUTR_S 7370	Nutritional Therapy I	3
NUTR_S 7380	Nutrition Therapy II	2
NUTR_S 7330	Human Nutrition II Laboratory	2

NUTR_S 8030	Etiology of Obesity	3
NUTR_S 8870	Exercise Metabolism	3
AN_SCI 8420	Endocrinology	3
V_PBio 8451	Introduction to Immunology	3
SOC_WK 7330	Addiction Treatment and Prevention	3

## Public Health Nutrition

NUTR_S 7330	Human Nutrition II Laboratory	2
NUTR_S 7360	Nutritional Assessment	3
NUTR_S 7590	Community Nutrition	3
AN_SCI 8420	Endocrinology	3
F_C_MD 8420	Principles of Epidemiology	3
SOC_WK 7330	Addiction Treatment and Prevention	3
SOCIO 7400	Sociology of Health	3
V_PBio 6678	Epidemiology and Community Health	2-6
V_PBio 8451	Introduction to Immunology	3
V_PBio 8455	Epidemiology and Biostatistics	2

## Behavioral Science

BIO_SC 7500	Neurobiology	3
BIO_SC 7560	Sensory Physiology and Behavior	3
BIO_SC 7640	Behavioral Biology	3
BIO_SC 8450	Developmental Neurobiology	3
PSYCH 8210	Functional Neuroscience	3
SOC_WK 7330	Addiction Treatment and Prevention	3

## Food Science

F_S 7310	Food Chemistry and Analysis	4
F_S 7315	Food Chemistry and Analysis Laboratory	3
F_S 7370	Food Microbiology	3
F_S 7380	Sensory Analysis of Food and Beverages	3
F_S 7970	Food Product Development	3
F_S 8440	Functional Foods and Nutraceuticals	3
F_S 7331	Technology of Dairy Products and Ingredients	3

## Biochemistry/Cell Physiology

NUTR_S 8360	Nutritional Biochemistry I	3
NUTR_S 8870	Exercise Metabolism	3
BIO_SC 7374	Molecular Biology Laboratory	3
BIOCHM 7274	Biochemistry Laboratory	5
BIOCHM 8432	Enzymology and Metabolic Regulation	3
MPP 7310	Mammalian Cell Function	3-5
MPP 9426	Transmembrane Signaling	4
V_BSCI 7333	Veterinary Cell Biology	4
V_BSCI 8420	Veterinary Physiology	5
V_BSCI 8410	Seminar in Veterinary Biomedical Science	1

## Other Requirements

Primary investigator on one research grant during the second year of the doctoral program

Teaching (2 semesters)

Primary author on at least one research article prior to dissertation defense

## Qualifying Exam

The Qualifying Exam must be passed before a student is officially admitted to the doctoral program. The Qualifying Exam should be completed by the end of the second semester (D1 form should be filed with the Graduate School). The Qualifying Exam consists of a knowledge-based written exam and an oral exam.

## Comprehensive Exam

The comprehensive examination is the most advanced posed by MU. It consists of written and oral sections. A doctoral student must successfully complete the comprehensive examination within a period of five years beginning with the first semester of enrollment as a PhD student and at least seven months before the final defense of the dissertation. The two sections of the examination must be completed within one month. A report of this decision (pdf), carrying the signatures of all members of the committee, must be sent to the Graduate School and the student no later than two weeks after the comprehensive examination is completed.

## Doctoral Dissertation

The dissertation must be written on a subject approved by the candidate's doctoral program committee, must embody the results of original and significant investigation and must be the candidate's own work. All dissertation defenses shall be open to the general faculty. For the dissertation to be successfully defended, the student's doctoral committee must vote to pass the student on the defense with no more than one dissenting or abstaining vote.

## Annual Review/Rate of Progress

Annually, each graduate student must complete the Annual Review Requirement by updating information in the Graduate Student Progress System. At the end of each year the advisor will evaluate each master's student. Each student must maintain a 3.0 GPA. In addition, each graduate student must maintain adequate research progress as judged by the advisor and/or graduate committee. Inadequate progress will result in a probationary period of 30 days to 1 semester.

## Length of Study Policy

A doctoral student must successfully complete the comprehensive examination within a period of three (3) years beginning with the first semester of enrollment as a PhD student. In addition, the program for the doctoral degree must be completed within three (3) years of passing the comprehensive examination. Time spent in the armed services will not count toward the six (6)-year limit (See Graduate School Active Duty Policy). For any extension of either of these time limitations, the student must petition their faculty advisor/mentor and the academic program's director of graduate studies in writing during the semester prior to reaching the time limitation. The director of graduate studies will notify the advisor in writing of the decision.



## Pathobiology Area Program

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College of Veterinary Medicine  
201 Connaway Hall  
Columbia, MO 65211  
573-884-2444

### About the Pathobiology Area Program

The Pathobiology Area Program is university-wide and staffed by faculty from the College of Veterinary Medicine (Veterinary Pathobiology, Veterinary Medicine and Surgery), School of Medicine (Pathology and Anatomical Science, Molecular Microbiology and Immunology, Biochemistry), College of Arts and Science (Biological Sciences), and College of Agriculture, Food and Natural Resources (Biochemistry, Animal Sciences).

### Degrees Offered

Doctorate in Pathobiology

**Note:** The master of science program in biomedical sciences (p. 601), with an emphasis in veterinary pathobiology, is listed separately in this catalog but shares the pathobiology doctoral courses and faculty list.

### Faculty

**Professor** C. R. Brown\*\*, C. Caldwell\*, S. Casteel\*, J. Cook\*\*, G. Davis\*, K. C. Dellsperger\*\*, W. Fales\*, C. Franklin\*\*, C. Henry\*, T. Hoffman\*\*, G. C. Johnson\*, M. Katz\*\*, C. Lorson\*\*, D. Lubahn\*\*, C. Moore, D. O'Brien\*, D. Pintel\*, B. Ray\*, R. M. Roberts\*, H. Schatten, D. Shaw, G. P. Smith\*, R. W. Stich\*, C. V. Ward\*\*, H. Zaghouani

**McKee Endowed Professor** G. Stewart

**Associate Professor** Y. Agca\*\*, B. T. Beerntsen\*\*, A. Bermudez, D. Beversdorf\*, J. N. Bryan\*\*, E. Bryda\*, M. Calcutt\*\*, L. Cohn\*, D. D. Comelison, J. Dodam\*, T. Evans\*\*, D. Fox\*, S. A. Grant\*\*, G. S. Johnson\*, M. Lewis\*, S. Liu\*, M. Lorson, J. Middleton\*, W. J. Mitchell Jr., C. Phillips\*\*, C. Reddy\*, S. G. Sarafianos, C. Wiedmeyer\*\*

**Assistant Professor** K. Aldridge\*\*, D. Anderson\*, U. Atasoy\*, C. P. Baines\*, G. Blomquist\*, M. Daniels\*, V. Glinskii\*, Z. Gu\*, C. Holliday\*, K. Kuroki\*\*, S. Schommer\*, K. Taylor, G. Zhang\*

**Associate Clinical Professor** L. Berent\*, D. Kim, T. Reilly\*\*, C. Vogelweid\*, M. Whitney

**Associate Research Professor** A. Ray

**Professor Emeritus** C. A. Carson

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in pathobiology, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

Contact Information  
College of Veterinary Medicine  
201 Connaway Hall  
573-884-2444  
<http://www.cvm.missouri.edu/vpbio/>

**Director of Graduate Studies:**

- PhD in Pathobiology Area Program (p. 626)

### About the Program

The Pathobiology Area Program is university-wide and is staffed by faculty from the College of Veterinary Medicine (Veterinary Pathobiology, Veterinary Medicine and Surgery), School of Medicine (Pathology and Anatomical Science, Molecular Microbiology and Immunology, Biochemistry), College of Arts and Science (Biological Sciences), and College of Agriculture, Food and Natural Resources (Biochemistry, Animal Sciences).

**Note:** The master of science program in biomedical sciences (p. 601), with an emphasis in veterinary pathobiology, is listed separately in this catalog but shares the pathobiology doctoral courses and faculty list.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. In this program, various stipends are available, including teaching and research assistantships and postdoctoral fellowships. Check the program Web site or ask the program contact for details.

### Career Preparation

Graduate training relates to the major departmental thrust — application of advanced biotechnology to solving today's most perplexing agricultural, biomedical and companion animal questions. The faculty in the Pathobiology Area Program consists of scientists engaged in a wide variety of research programs supported by grants and contracts from government, foundations and private industry.

The Pathobiology Program is designed to prepare students for advanced professional careers in universities and colleges, research institutes, public health, hospital laboratories and industrial research. The broad scope of the program and its organization across departments creates an atmosphere for meaningful interdisciplinary dialogue between graduate students and faculty. Furthermore, it increases availability of advisers, committee members, facilities and equipment for doctoral candidates.

A PhD candidate may choose a plan of research to take advantage of a wide range of interests and specialties in pathology and microbiology.

### Facilities and Resources

Facilities are available that are suitable for advanced research in pathology, microbiology and molecular biology. A wide range of equipment for advanced molecular biological procedures is available. BSL-3 biocontainment facilities are available.

### Areas of Study

Toxicology, environmental toxicology, comparative medicine, epidemiology and pathogenesis of avian and mammalian diseases (companion animal, food-producing animal and spontaneous disease of laboratory animals), molecular biology, ultrastructure, parasitology,

DNA and RNA analysis, biomechanics, physiology, pathophysiology, oncology, bioinformatics, diagnostic anatomic pathology, veterinary neuropathology, pathology of infectious disease, quantitative pathology, molecular genetics, domestic animal genomics, bacteriology/mycology, virology, cell biology, genomics, and antimicrobial resistance.

## Courses

Courses for the program are from a wide variety of areas within the university, including veterinary pathobiology (p. 1163), veterinary medicine and surgery (p. 1158), pathology and anatomical science (p. 1051), microbiology (p. 1011), biochemistry (p. 745), biological sciences (p. 751), and animal sciences (p. 712). Refer to the cumulative listing of course offerings (p. 697) for details.

## Graduate

### PhD in Pathobiology Area Program

#### Contact Information for Area Pathobiology

Anne Chegwiddden  
201 Connaway Hall  
Columbia, MO 65211  
573-884-2444  
chegwiddden@missouri.edu

#### Admission Criteria

Fall deadline: n/a  
GRE scores: GRE scores required  
Minimum TOEFL scores (international applicants only):

Internet-based test (iBT)	Paper-based test (PBT)
61	500

Minimum undergraduate GPA for last 60 credits: 3.0  
Designated faculty mentor  
Professional students with a DVM degree may be eligible to waive the GRE.

#### Required Application Materials

**To the Graduate School:**  
All required Graduate School documents

**To the Pathobiology Area Program:**  
3 letters of recommendation (can be submitted through the Graduate School's online application as well)  
GRE scores (required)  
Mentor letter of support

#### Plan of Study

Most of the student's program and examining committees shall be from the Area Program faculty. Under the guidance of a program committee, a course of study is individually designed to fit each student's academic background, experience and objectives. Courses may be chosen from one or more departments, as decided by the student in conjunction

with the student's mentor/committee, but shall constitute a definite plan of education for research or scholarly investigation in some particular aspect of microbiology, pathology, or comparative medicine. The final examination covers mainly the dissertation.

#### Degree Requirements

Research is the foundation of graduate and postdoctoral study and students within the Pathobiology Area Program can expect to spend 75 percent of their time engaged in research activities. The PhD degree requires 72 credit hours of work including a minimum of 15 credits of upper-level graduate course work exclusive of research credits. The student must pass a written and/or oral comprehensive examination in the area of study and write, present and defend a dissertation that embodies the results of original and significant investigation by the candidate. Up to 30 hours of post-baccalaureate credit from an accredited institution may be transferred toward the doctoral degree.

#### Interdisciplinary Area of Pathobiology

The Department of Veterinary Pathobiology in the College of Veterinary Medicine, along with the Department of Pathology and Anatomical Sciences in the School of Medicine and faculty from many other departments throughout the University, offer a PhD degree through the Pathobiology Area Program.

Prospective students must have a solid background in the life sciences, with advanced level experience in microbiology, immunology, genomics, molecular biology, cell biology, pathology, and/or biology.

Research experience at the undergraduate and/or master's level is also desirable.

The Pathobiology Area Program is designed to prepare students for advanced professional careers in universities and colleges, research institutes, public health, hospital laboratories and industrial research. The broad scope of the program and its organization across departments creates an atmosphere for meaningful interdisciplinary dialogue between graduate students and faculty. A PhD candidate may choose a plan of research to take advantage of a wide range of interests and specialties in pathology and microbiology. Facilities are available that are suitable for advanced research in pathology, microbiology, and molecular biology. A wide range of equipment for advanced molecular biological procedures is available. Various stipends are available, including teaching and research assistantships and postdoctoral fellowships.

Faculty members of the Program guide the selection of coursework and the development of a dissertation project. A list of doctoral faculty eligible to supervise PhD students is available here (<http://www.cvm.missouri.edu/AreaPatho>).

For additional information regarding mentorship specifically in the Department of Pathology and Anatomical Sciences program, please contact:

Dr. Carol Ward  
M263 Medical Sciences Building, MU School of Medicine  
573-882-1201 (phone), 573-884-4612 (fax)  
wardcv@missouri.edu

## Pathology

School of Medicine  
 M263 Medical Sciences Building  
 (573) 882-1201  
 pathology-anatomy.missouri.edu

### About Pathology and Anatomical Sciences

The Department of Pathology and Anatomical Sciences in the School of Medicine, along with the department of Veterinary Pathobiology in the College of Veterinary Medicine, offers a PhD degree through the Pathobiology Area Program. Faculty also participate in other doctoral programs such as the Integrative Neuroscience Program, Genetics Area Program, and Molecular Pharmacology and Physiology. The MS degree is designed primarily to prepare students for supervisory roles in basic-science and clinical laboratories, and to offer greater in-depth study in pathology and anatomical sciences concurrent with studies leading to the PhD and/or MD degree.

### Degrees offered

- Master of Science in Pathology
- PhD in Pathobiology Area Program

### Faculty

- Professor** G. E. Davis, W. J. Krause\*\*, J. H. Miles, G. Y. Sun, C. V. Ward\*
- Associate Professor** E. H. Adelstein\*\*, A. A. Diaz-Arias\*, E. A. Ingram, R. Mitra\*
- Assistant Professor** K. J. Aldridge\*, G. L. Arthur\*, V. V. Glinskii\*\*, Z. Gu\*\*, C. M. Holliday\*\*, K. H. Taylor\*\*
- Lecturer** D. L. Dufeu, R. H. Dunn, S. D. Maddux\*
- Clinical Instructor** J. Jones, D. V. Shin
- Clinical Professor** D. C. Miller\*, M. Petrides\*
- Associate Clinical Professor** A. D. Havey\*
- Assistant Clinical Professor** M. Esebua, S. R. Frazier, C. C. Stacy\*, M. X. Wang\*
- Associate Research Professor** R. R. Little
- Assistant Research Professor** J. Cui
- Adjunct Professor** M. J. Ravosa\*\*, M. S. Stack\*\*
- Associate Professor Emeritus** L. E. Spollen

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in pathology and anatomical sciences, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

## Graduate

School of Medicine  
 M263 Medical Sciences Building  
 (573) 882-1201  
 pathology-anatomy.missouri.edu

- MS in Pathology (p. 627)

### About Pathology and Anatomical Sciences

The Department of Pathology and Anatomical Sciences in the School of Medicine, along with the department of Veterinary Pathobiology in the College of Veterinary Medicine, offers a PhD degree through the Pathobiology Area Program. Faculty also participate in other doctoral programs such as the Integrative Neuroscience Program, Genetics Area Program, and Molecular Pharmacology and Physiology. The MS degree is designed primarily to prepare students for supervisory roles in basic-science and clinical laboratories, and to offer greater in-depth study in pathology and anatomical sciences concurrent with studies leading to the PhD and/or MD degree.

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

## Graduate

### MS in Pathology

**Admission Contact Information**  
 Director of Graduate Studies  
 MU School of Medicine  
 M263 Medical Sciences Building  
 Columbia, MO 65211  
 573 882-1201  
 573-884-4612 (fax)  
 pathology-anatomy.missouri.edu

The MS degree is designed primarily to prepare students for supervisory roles in basic-science and clinical laboratories, and to offer greater in-depth study in pathology and anatomical sciences concurrent with studies leading to the PhD and/or MD degree.

### Application Deadline

Fall entrance: Inquire with Director of Graduate Studies

### Admission Criteria

- Admission to candidacy in the master's program is limited to those who hold at least a baccalaureate degree from an accredited college or university.
- Preference will be given to students with a college GPA of 3.5 or higher
- Minimum GRE scores:

<b>When did you take the GRE?</b>	<b>Verbal + Quantitative</b>	<b>Analytical</b>
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Prior to August 1, 2011 N/A

On or After August 1, 2011 325 N/A

## Required Application Materials to the Graduate School:

- All required Graduate School documents

## Degree Completion Requirements

Each candidate for the master's degree is required to complete a minimum of 30 semester hours at the 8000 or 9000 level and maintain a B or better GPA in graduate course work, with no more than 12 hours of research, problems, seminars or special investigations.

Candidates also must satisfactorily complete a thesis. A candidate is expected to demonstrate knowledge of clinical and/or research techniques and to defend the thesis.

Faculty members advise students regarding their program of study and thesis research. A list of graduate faculty eligible to supervise MS students is available on the departmental website.

Required courses and those of special interest should complement the student's academic background and career objectives. The MS degree is designed primarily to prepare students for supervisory roles in basic-science and clinical laboratories, and to offer greater in-depth study in pathology and anatomical sciences concurrent with studies leading to the PhD and/or MD degree.

Admission to candidacy in the master's program is limited to those who hold at least a baccalaureate degree from an accredited college or university.

Preference will be given to students with a college GPA of 3.5 or higher, GRE scores (verbal + analytical) over 325, and strong letters of recommendation.

Each candidate for the master's degree is required to complete a minimum of 30 semester hours at the 8000 or 9000 level and maintain a B or better GPA in graduate course work, with no more than 12 hours of research, problems, seminars or special investigations.

Candidates also must satisfactorily complete a thesis. A candidate is expected to demonstrate knowledge of clinical and/or research techniques and to defend the thesis.

Faculty members advise students regarding their program of study and thesis research. A list of graduate faculty eligible to supervise MS students is available on the departmental website.

Required courses and those of special interest should complement the student's academic background and career objectives.

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## Public Health

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### Two Different Public Health Degree Options

The University of Missouri offers two different degree programs in the area of public health: the Master of Public Health, and a Master of Science in Public Health.

- The Graduate School confers the **Master of Public Health (MPH)** degree. The MPH Program has two emphasis areas Health Promotion and Policy or Veterinary Public Health; dual degrees with Public Affairs, Journalism, and Veterinary Medicine; and a graduate certificate. This public health coursework reflects the University of Missouri's strength in the health professions, social work, nursing, medicine, veterinary medicine, and arts and sciences. The MPH is a course of study appropriate for students with a wide variety of undergraduate degrees including social work, political science, biology, and communication.
- A **Master of Science in Public Health (post-doctorate)** is offered by the Department of Family and Community Medicine in the College of Medicine. Applicants must be graduates of an accredited medical school, U.S. citizens or permanent residents, and licensed to practice in a primary care specialty.

### Faculty

#### MPH in Public Health - Graduate School

**Professor** K. Hagglund\*\*, M. C. Hosokawa\*, M. Sable\*  
**Associate Professor** B. Beerntsen\*, J. Nicholson-Crotty, C. Reddy\*  
**Assistant Professor** N. Cheak-Zamora\*, J. McElroy\*, W. Majee\*, P. Pithua\*, S. Potochnick\*, M. Teti\*, M. Yu\*  
**Associate Teaching Professor** D. Hume\*  
**Assistant Teaching Professor** S. Lee  
**Clinical Assistant Professor** L. Schultz  
**Instructor** L. Phillips, L. Saffran\*  
**Professor Emeritus** K. Libbus  
**Adjunct Instructor** L. Cooperstock, L. Evans, C. Jenkins, V. Nguyen, D. Pratt, L. Porth, C. Sale

#### MS in Public Health (post-doctorate) - College of Medicine

**Professor** J. D. Campbell, E. Garrett\*, L. A. Headrick, M. C. Hosokawa\*, M. LeFevre\*, D. R. Mehr\*, D. Parker-Oliver\*, E. Ringdahl\*, W. Steinmann, J. Stevermer, D. C. Vinson\*, H. A. Williamson\*, S. C. Zweig\*  
**Associate Professor** J. Belden, D. Cravens\*, K. Everett\*, A. B. Fitzsimmons, K. Y. Kane\*, J. Kapp\*, S. Kinkade\*, K. Kochendorfer\*, R. Koopman\*, E. J. Lindbloom\*, C. Reust\*, D. Wen\*, A. Whaley-Connell  
**Assistant Professor** K. Craig, D. Howenstine, P. Koopman, J. McElroy\*, L. Morris, A. Swenson, S. Swofford, P. Tatum III\*  
**Research Professor** D. Oliver\*  
**Associate Research Professor** K. Hoffman\*, R. L. Kruse\*  
**Professor Emeritus** R. L. Blake Jr.\*, J. M. Colwill\*

\* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.

\*\* Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

### Undergraduate

While MU does not offer undergraduate degrees specifically in public health, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (p. 5).

### Graduate

#### Master of Public Health (MPH) Program

802 Lewis Hall  
573-884-6844  
<http://publichealth.missouri.edu/>

**Program Director:** Kristofer Hagglund

- MPH in Public Health (p. 629)
- Graduate Certificate in Public Health (p. 630)

The Graduate School confers a Master of Public Health (MPH) degree. The MPH Program has two emphasis areas Health Promotion and Policy or Veterinary Public Health; three dual degrees with Public Affairs, Journalism, and Veterinary Medicine; and Graduate Certificate. This public health coursework reflects the University of Missouri's strength in the health professions, social work, nursing, medicine, veterinary medicine, and arts and sciences. Appropriate for students with a wide variety of undergraduate degrees including social work, political science, biology, communication, and related fields.

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#### Master of Science (MS) in Public Health (post-doctorate)

School of Medicine  
M224 Medical Sciences Building, DCO32.00  
Columbia, MO 65212  
573-884-7060  
<http://www.fcm.missouri.edu/>

- MS in Public Health: Family and Community Medicine (p. 630)

The Master of Science in Public Health is offered by the Department of Family and Community Medicine in the College of Medicine. Applicants must be graduates of an accredited medical school, U.S. citizens or permanent residents and licensed to practice in a primary care specialty.

### Graduate

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#### MPH in Public Health

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#### MPH Application and Admission Information

Admission Contact Information  
Enola White ([mumphprogram@missouri.edu](mailto:mumphprogram@missouri.edu))

802 Lewis Hall  
Columbia, MO 65211  
573-884-6844  
<http://publichealth.missouri.edu/>

The Master of Public Health (MPH) is the standard professional degree recognized throughout the world for public health practice. The MPH program at the University of Missouri trains practitioners, teachers, researchers, and administrators to plan, implement, and evaluate programs aimed at enhancing health in human populations through organized effort on the local, state, and national level.

All public health students are educated in the core domains of public health and participate in a supervised internship in a public health agency. The combination of course work and practical experience produces individuals who are highly qualified to enter the public health workforce.

The MPH curriculum is drawn from a variety of collaborating academic programs and units. Public health coursework reflects the University of Missouri's strength in the health professions, social work, journalism, public affairs, nursing, medicine, veterinary medicine, and arts and sciences.

## Degrees

The MPH is available in two emphasis areas:

- Health Promotion and Policy
- Veterinary Public Health

**Three dual degrees are also offered:**

- MPH/Doctor of Veterinary Medicine ([http://publichealth.missouri.edu/programs\\_mphdvm.php](http://publichealth.missouri.edu/programs_mphdvm.php))
- MPH/Master of Public Affairs ([http://publichealth.missouri.edu/programs\\_mphmpa.php](http://publichealth.missouri.edu/programs_mphmpa.php))
- MPH/Master of Arts, Journalism ([http://publichealth.missouri.edu/programs\\_mphma.php](http://publichealth.missouri.edu/programs_mphma.php))

## Thesis Option

The Masters Thesis Research (P\_HLTH 8090) requires independent research aimed at discovery and/or development of elements or relationships derived from a public health theory. A formal written report using guidelines established by the MU Graduate School is required. Masters Thesis Research enables the student to use the research process in a systematic inquiry of elements and relationships within public health theory. MU Graduate School Guidelines for the Thesis Process is available at <http://gradschool.missouri.edu/academics/thesis-dissertation/process/index.php>.

The Master's Thesis Project provides students with the opportunity to:

- generate a research question within a theory,
- formulate and implement a research design, and
- make recommendations for replication, revisions, or future investigations.

## Application Deadlines

- Fall semester: July 1st
- Spring semester: December 1st
- Summer semester: May 1st

## Admission Criteria

- Minimum TOEFL scores:

Internet-based test (iBT)	Paper-based test (PBT)
80	550

- Minimum Academic IELTS overall score: 6.0
- Minimum GRE score: not set
- Minimum GPA: 3.0 in last 60 hours of undergraduate coursework

## Required Application Materials

For more information to apply click here (<http://publichealth.missouri.edu/apply.php>).

## Graduate Certificate in Public Health

### Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

### Admission

Students wishing to pursue a Graduate Certificate in Public Health should complete the MU Graduate School's online application (standardized test scores are not required). Certificate candidates must provide the MPH Program's Personal Data Sheet and official transcripts to the MPH Program.

### About the Certificate

This 12-credit-hour program provides students with the core public health education that they need to enhance their professional knowledge. The certificate program includes the following courses:

- Principles of Public Health
- An approved Health Statistics course
- Human Health and the Environment, Social and Behavioral Sciences in Public Health or Epidemiology
- One approved elective

### Applying to the Graduate Certificate Program

Students who complete the Graduate Certificate in Public Health with a minimum grade of B in each of the four courses will be recommended for admission to the Master of Public Health (MPH) program should they wish to continue their studies. The course credits earned for the graduate certificate will be credited toward the MPH degree. To apply click here (<http://publichealth.missouri.edu/apply.php>).

## MS in Public Health: Family and Community Medicine

### Admission Contact Information

Ashley Granger  
One Hospital Dr,  
M224 Medical Sciences Building, DCO32.00

573-884-7060

The Department of Family and Community Medicine has responsibilities for teaching, research and service activities covering the spectrum from primary medical care to community medicine. This graduate degree program is designed to prepare primary care physicians to work in an academic setting as faculty members with responsibilities for patient care, teaching, research, and scholarly endeavors. Applicants must be graduates of an accredited medical school, U.S. citizens or permanent residents and licensed to practice in a primary care specialty.

## Application Deadline

Deadline for Fall entrance: Call for deadline dates

## Admission Criteria

- Board-certified/board-eligible primary care physicians

## Required Application Materials

To the Graduate School:

All required Graduate School documents

To the Program (call for application):

- 3 letters of recommendation
- Departmental application
- Personal statement
- CV or resume
- Verification from medical school and residency program
- Official transcripts

## Financial Aid from the Program

Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program Web site or ask the program contact for details.

## Plan of Study

The graduate program leading to the master of science includes a combination of course work, research and field experience. Courses cover areas such as research methods, epidemiology, biostatistics and learning theory.

The program requirements include 30 hours of graduate course work and the completion of scholarly project.

## Additional Minors and Certificates - Interdisciplinary Academic Programs

### Undergraduate

- Certificate in Digital Global Studies (p. 632)
- Minor in Entrepreneurship (p. 632)
- Certificate in Environmental Studies (p. 633)
- Certificate in General Honors (p. 633)

### Graduate

- Minor in Ancient Studies (p. 633)
- Certificate in Autism and Neurodevelopmental Disorders (p. 635)
- Certificate in Center for the Digital Globe (p. 635)
- Minor in College Teaching (p. 637)
- Certificate in Community Processes (p. 638)
- Certificate in Conservation Biology (p. 638)
- Certificate in European Union Studies (p. 638)
- Minor in Gerontology (p. 638)
- Certificate in Health Ethics (p. 639)
- Minor in International Development (p. 639)
- Certificate in Society and Ecosystems (p. 639)

## Undergraduate

### Certificate in Digital Global Studies

This certificate is designed to prepare students in any discipline for our new global reality and equip them with the knowledge and skills needed to be successful in today's highly competitive global job market. All current MU undergraduate students in any discipline are eligible to participate.

The structure of the requirements includes two required courses (more cross-listed options will be added), two elective courses, and an experiential learning component. Below are the details on the required courses. A list of approved options for the electives is available online at <http://cdig.missouri.edu/globalconnect/electives.html>.

The experiential learning component varies depending on the student's field of study and interest, but an emphasis on global relations, cultural awareness, or media technology is required. This component could be study abroad, service learning, internship, etc, with an MU Center or an outside local, national or international organization.

For additional information on the certificate, contact:  
 Center for the Digital Globe  
 310 Reynolds Journalism Institute  
 Columbia, MO 65211  
 phone: 573-882-8770  
 email: [globalconnect@missouri.edu](mailto:globalconnect@missouri.edu)  
 website: <http://globalconnect.missouri.edu/>

### Requirements

JOURN 3510	Think Global: Fundamentals of Globalization and Digital Technologies	3
or GERMAN 3510	Think Global: Fundamentals of Globalization and Digital Technologies	
or PEA_ST 3005	Topics in Peace Studies - Humanities	
T_A_M 4820	Concluding Seminar, MU Global Connect	3

## Minor in Entrepreneurship

The undergraduate minor in entrepreneurship at the University of Missouri is built upon three pillars: development of creativity, opportunity for innovative action, and management of entrepreneurial enterprises.

Students who wish to complete the minor are encouraged to declare their intention as soon as possible. This allows the required courses to be effectively integrated into their course schedules along with other courses required for their intended major. An advisory committee will be appointed to make administrative decisions related to the minor (course additions/deletions). The members will be recommended by deans of the participating schools and colleges. Primary responsibility for student advising falls within the home college of the student OR in the unit where students claim the minor (e.g. Arts and Sciences students).

The minor consists of **16 credit hours**. Students must complete coursework in management, creativity, and innovation, as well as in a workshop series that represents a common learning experience for all MU entrepreneurship minors. Three hours of coursework is required in each area, and a one hour experiential seminar course. Students must select the final three hours to complete the minor from approved courses in one of the pillars.

### SAMPLE COURSES

#### Course 1: Management of Entrepreneurial Organizations & Enterprises

AG_EC 3283	Fundamentals of Entrepreneurship	3
MANGMT 4700	Principles of Entrepreneurship	3

#### Course 2: Development of Creativity

ARCHST 1100	Visual Design	3
ARCHST 1600	Fundamentals of Environmental Design	3
ARCHST 3100	Color and Light	3
T_A_M 1200	Basic Concepts of Apparel Design and Production	3
T_A_M 2380	Integrated Apparel Design and Production I	3
T_A_M 2480	Apparel and Textile Presentation Techniques	3
T_A_M 2580	Digital Textile and Apparel Applications	3
T_A_M 3380	Integrated Apparel Design and Production II	3
T_A_M 4480	Creativity and Problem Solving	3
H_D_FS 3510	Curriculum and Activities for the Early Childhood Setting	3

#### Course 3: Organizational & Business Fundamentals

ARCHST 2100	Understanding Architecture and the American City	3
ARCHST 4430	Guiding Design with Historic Preservation	3
H_D_FS 4570	Development and Administration of Child Services Programs	3
FINPLN 3283	Financial Planning: Computer Applications	3
FINPLN 4382	Financial Planning: Risk Management	3
FINPLN 4383	Financial Planning: Investment Management	3



T_A_M 1300	Softgoods Retailing	3
T_A_M 2300	Retail Finance and Merchandise Control	3
T_A_M 4200	Fundamentals of E-Commerce	3
<b>Course 4: Entrepreneurial Individualized Perspective</b>		
ARCHST 4940	Internship in Environmental Design	1-99
H_D_FS 4993	Internship in Human Development and Family Studies	1-99
FINPLN 4993	Internship in Personal Financial Planning	1-99
T_A_M 4949	Field Training in Textiles and Apparel Management	1-99
NUTR_S 4940	Internship in Nutritional Science and Exercise Physiology	1-6
<b>Course 5: Practicum Capstone</b>		
ARCHST 4990	Thesis Design Studio	4
H_D_FS 4570	Development and Administration of Child Services Programs	3
FINPLN 4389	Financial Planning: Case Analysis	3
T_A_M 4980	Apparel Production Management	4
T_A_M 4990	Retail Marketing and Merchandising	3
<b>PLUS 1: Experiential Seminar</b>		
MANGMT 4185	Problems in Management	1-99

## Certificate in Environmental Studies

An Interdisciplinary Program in the Office of the Provost  
 Jan Weaver, Director  
 208 Tucker  
 (573) 882-3037  
<http://web.missouri.edu/~umcsnresiwwww/>

Many environmental careers require the kind of discipline-specific education available in traditional majors, but with an added base of knowledge about environmental issues and the skills to address them. The Certificate in Environment Studies provides that base.

The Certificate is available to all majors. However, because of the variety of majors and the goal of the certificate program to compliment a specific course of study, students must select courses in consultation with the Environmental Studies advisor.

### Certificate Requirements

- 6 hours of Foundation Environmental Courses
- 3 hours of Environmentally-related Seminar
- 6 hours of Upper Level Environmental Courses

### Sample Certificate for a Sciences Major

SOCIOL 1120	Population and Ecology	3
GEOG 2660	Environmental Geography	3
ENV_ST 2070	Introduction to Ecological Economics	3
Social Dimensions Course		3
Social Dimensions Course		3

### Sample Certificate for a Social/Behavioral Sciences or Humanities Major

BIO_SC 1060	Basic Environmental Studies	3
ATM_SC 1050	Introductory Meteorology	3
ENV_ST 2110	Environmental Sustainability	3
Natural Dimensions Course		3
Natural Dimensions Course		3

*Natural and Social Dimensions Courses* are offered in other departments throughout the university. Check the Environmental Studies website or visit with the director to get an up-to-date list of courses that fit these categories.

Social Dimensions Course (3000 level)	3
Elective (3000 level)	3
Elective	3
<b>Total</b>	<b>120</b>

## Certificate in General Honors

Students who complete 20 or more honors credit hours and have a 3.3 MU GPA may graduate with general honors. The General Honors Certificate is noted on a student's final transcript. Up to six hours of departmental honors courses, six hours of transfer honors courses, and six hours of Learning by Contract courses may be used toward the 20 hours. In order to receive honors credit for an honors designated course, you must earn a "C" or better.

Upon completion of the 20 hours of honors course work, students must apply for their honors certificate. Graduating students must apply for their honors certificate by mid-semester to graduate with general honors and to have the notation on their transcript.

For additional information on the certificate, contact:

MU Honors College  
 211 Lowry Hall  
 Columbia, MO 65211  
 phone: 573-882-3893  
 fax: 573-884-5700  
 email: [umchonorscollege@missouri.edu](mailto:umchonorscollege@missouri.edu)  
 website: <http://honors.missouri.edu/contact>

## Graduate

### Graduate Minor in Ancient Studies

Interdisciplinary Minor within the College of Arts and Science  
<http://ancientstudies.missouri.edu/index.shtml>

### About the Minor

The Ancient Studies program, created in 1968, is shared among the faculty from six departments at the University of Missouri. This minor provides an opportunity for students to diversify their curriculum and to perceive their field in a broader context than is possible within a departmental program. Students in this program select about one quarter

of the total courses from among a variety of courses designated by the participating departments.

A student pursuing a graduate degree in Anthropology, Art History and Archaeology, Classical Studies, History, Philosophy or Religious Studies may elect an Ancient Studies minor at either the M.A. or Ph.D. level. The Department of Classical Studies offers graduate work leading to the master of arts degree in classical languages with emphasis on Latin, Greek or both classical languages. The PhD degree in classical studies requires work in both Greek and Latin.

## Contact Information

Department of Anthropology  
107 Swallow Hall  
573-882-4731

Department of Art History and Archaeology  
109 Pickard Hall  
573-882-6711

Department of Classical Studies  
405 Strickland Hall  
573-882-0679

Department of History  
101 Read Hall  
573-882-2481

Department of Philosophy  
438 Strickland Hall  
573-882-2871

Department of Religious Studies  
220 Arts & Science Building  
573-882-4769

## Faculty

**Professor** R. L. Lyman, A. Melnyk, J. M. Foley, M. J. O'Brien, D. M. Pearsall, C. Saylor, K. W. Slane, T. Tarkow, I. Worthington

**Curators' Professor** M. Smith

**Associate Professor** S. Langdon, L. Okamura, D. Schenker, D. Hooley, R. Marks, J. McGlew, A. Mori, M. Rautman, D. Trout, B. Wallach

**Assistant Professor** N. DesRosiers, R. Foley, R. Gregory, D. Kelley

**Assistant Teaching Professor** M. Barnes

**Professor Emeritus** W. R. Biers, W. Bondeson, J. H. Kultge

## Admissions

Ancient Studies Program Requirements

1. Admission into one of the following graduate departments: Anthropology, Art History and Archaeology, Classical Studies, History, Philosophy or Religious Studies.
2. Fulfillment of all the requirements of the major department. The master's degree may be completed within approximately two years; the doctorate normally requires three years of course work beyond the master's level.
3. The minor consists of additional courses to be selected from Ancient Studies courses outside the student's major department; it usually constitutes about one-quarter of the graduate course work. For recognition of the minor, students should apply formally to the current chair of the Ancient Studies Committee.

- A. For the M.A. degree, a minimum of 9 hours from at least two departments.
- B. For the Ph.D. degree, a minimum of 24 hours (including the work for the M.A.) from at least two departments outside the student's home department. These must include at least one course on the 7000-level in each of the two departments.

## To the University

General admission and degree requirements for the Graduate School are determined by the Graduate Faculty Senate. However, admission to the Graduate School does not in itself entitle a student to candidacy for an advanced degree. A student must also be accepted for advisement by the faculty of a department or area. Departments and areas establish admission standards that, in many cases, exceed the minimum requirements of the Graduate School. Admission to the Graduate School is based on three considerations:

- an official transcript showing that the applicant has earned a baccalaureate, DVM, MD or JD degree equivalent to that granted by MU,
- a grade point average of B or better in the last 60 hours of undergraduate courses and
- Official GRE results

## To the Ancient Studies Program

Candidates must have earned a bachelor's degree in an appropriate field; preference is usually given to students who intend to continue their work for a PhD. An application, including a completed MU Graduate School application form, transcript and GRE scores, should be made directly to the department in which the student wishes to study. It must be accompanied by three letters of recommendation concerning the student's academic ability, a copy of a recent term paper, and a short statement from the applicant that sets out professional goals and reasons for pursuing the Ancient Studies minor. Inquiries may be addressed to the directors of graduate studies at the appropriate department.

## Financial Support

The Ancient Studies Committee is able to award one fellowship (renewable for four further years) to a doctoral student entering from a University other than MU. In addition, applicants may be eligible for fellowships administered by the Graduate School, including the Gus T. Ridgel Fellowships for Minority Americans. In addition to a stipend, University fellowships include exemption from resident and non-resident educational fees. Some individual departments also offer fellowships, scholarships and other financial assistance for graduate students, including teaching and research assistantships. For information concerning financial aid, write directly to the directors of graduate studies in the department to which you are applying. Financial aid deadlines are frequently earlier than the deadline for applications for admission.

In addition to the materials for admission to the Ancient Studies program, applicants for financial support must submit a separate letter to the department applying for fellowship or assistantship support.

## Graduate Certificate in Autism and Neurodevelopmental Disorders

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### Note: This program is no longer accepting applicants

The certificate is designed to allow students from multiple disciplines to gain knowledge of the specialized needs of persons with autism and other developmental disorders. Professionals currently working with children with ASD and other Neurodevelopmental Disorders will enhance their skills, and those who wish to work with this population will enhance their future employability. Additionally, students might use the Certificate to learn about the field, perhaps leading to further graduate study and an advanced academic degree.

## Graduate Certificate in Center for the Digital Globe

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The Center for the Digital Globe graduate certificate is a 12 credit hour graduate certificate program established by the College of Business, School of Journalism, School of Law and the Department of Textile and Apparel Management in the College of Human Environmental Sciences. The Center for the Digital Globe offers two graduate certificate options. The requirements for each are outlined below.

### Stand-Alone Certificate (For non-degree graduate students and students completing professional degrees) **OR** Graduate-Degree-Dependent Certificate (For students completing a graduate degree)

#### I. CDiG STAND-ALONE CERTIFICATE (For non-degree graduate students and students completing professional degrees)

The Center for the Digital Globe, established by the College of Business, School of Journalism, School of Law and Department of Textile and Apparel Management in the College of Human Environmental Sciences, offers a 12 credit hour interdepartmental certificate to non-degree graduate students and professional students of the University of Missouri. The prerequisite for the stand-alone certificate is a baccalaureate degree. The certificate program supplements the students' studies within the various colleges and schools that make up the University. This is not a degree-granting program. Instead, the certificate attests to the students' successful completion of a required course of study with emphasis on the managerial, theoretical and policy-related issues associated with digital media, electronic commerce and globalization. Students receiving the stand-alone certificate will have demonstrated competencies in:

*Technology* - Students need not have achieved mastery of specific engineering, programming or application skills. Instead, the students must demonstrate a working understanding of how digital technologies function.

*Global Communication* - One of the primary characteristics of digital technologies, and particularly the Internet, are their function as worldwide communications media. Whether from the perspective of journalism, business or the law, the impact of these new communications channels has been substantial. Students should achieve an understanding of how new media are different from print or broadcast media and the consequences of those differences.

*Business* - Students should be well grounded in the principles, opportunities and ethical uses of electronic commerce and its impact on journalism, law and commercial practices.

*Culture and Society* - Digital media raise recurrent questions which call for political and social solutions. Students should be able to understand the broader issues raised by technological change and be prepared to take positions of leadership as such issues present themselves. Examples of such issues are questions of globalization, political boundaries, access, ownership and uses of information, marketing, etc. To achieve the goals of the certificate and assure its value to students, the University and prospective employers or donors, the certificate program enjoys certain characteristics. Perhaps most fundamental is the interdisciplinary nature of the program. While each department has the capability of offering a course emphasis, track or intra-departmental certificates to students in the area of technology and commerce, one of the fundamental concepts underlying the Center is the value and necessity of approaching these issues from the perspective of various disciplines. With these principles in mind, the program has been designed to assure that the interdisciplinary character of the course of work will be emphasized. The required course work compels students to come together for an interdisciplinary introduction to their studies and permits them to work separately and within their respective disciplines for further study. Students come together for a concluding experience that involves working collectively through a case study.

#### Academic Requirements for the Stand-Alone Certificate:

##### Eligibility:

Prerequisite for the stand-alone certificate is a baccalaureate degree. Professional students who are pursuing the stand-alone certificate must dually enroll in the Graduate School, be admitted to the CDiG Graduate Certificate Program and receive graduate credit for their 12 semester hours of stand-alone certificate courses. Others seeking this certificate who are not professional students and have not been admitted to Graduate School must also apply and be admitted to the CDiG Graduate Certificate Program. Apply online at the following web site: <https://app.applyyourself.com/?id=umc-grad>

**SPECIAL NOTE FOR LAW STUDENTS:** No more than six non-Law credits may count toward the JD degree.

#### Credits required for the Stand-Alone Certificate:

At least 12 eligible credit hours, consisting of an introductory, interdisciplinary course (Management 8100), 6 credit hours in two or more eligible graduate courses, and a concluding seminar/research project course (Journalism 8052). The course of work for graduate certificate students is more specifically described as:

1. Management 8100: Exploring the Digital Globe, 3 credits (offered fall semesters). This inter-departmental course introduces students to the impacts of technological change and globalization from the perspective of business, law and journalism. Students are introduced to electronic commerce, digitization and globalization to prepare them to respond to the challenges of the digital globe. Students do not acquire specific technological skills; they acquire a working understanding of how digital technologies function. The course is taught by faculty from the journalism, business and law schools, and from the Department of Textile and Apparel Management of the College of Human Environmental Sciences. Visiting speakers, including speakers presenting programs for the Center for the Digital Globe, meet with the class to share their research and experience.

2. 6 credits of graduate course work - The courses taken to satisfy this requirement are those that have been approved by the Center's faculty in consultation with the academic programs that offer the courses. The approved courses are graduate level courses that address one or more of the competencies specified above. See the Center for the Digital Globe's graduate courses web page <http://cdig.missouri.edu/coursesgrad.html> for a list of approved courses that meet this requirement.

3. Journalism 8052: Case Studies in the Digital Globe, 3 credits (offered fall and winter semesters). The course is designed to further develop the levels of understanding and skills obtained in previous course work. In this class, students will achieve a better understanding of how new media are different from print or broadcast media and the consequences of those differences. Students are introduced to the principles, opportunities and ethical use of electronic commerce. Students critically analyze issues raised by technological change, including globalization, political boundaries, access, ownership and uses of information, marketing, etc. As with the introductory class, this course is taught by faculty from a variety of departments. Visiting speakers, including speakers presenting programs for the Center for the Digital Globe, meet with the class to share their research and experience.

4. Grades - Students must maintain a minimum grade of 3.0 or equivalent in each course to receive credit toward completion of the certificate.

#### **Stand-Alone Certificate Requirements Summary and Final Application for Certificate**

To be eligible for the stand-alone certificate in the Center for the Digital Globe, students are required to take four courses for graduate credit: two courses offered through Center for the Digital Globe and two electives. The required courses are Management 8100 (Exploring the Digital Globe) and Journalism 8052 (Case Studies in the Digital Globe). The two electives should be determined in consultation with the student's CDiG affiliated advisor. To receive the certificate upon completion of the program, students must also print and fill out the *Application for a Graduate Certificate Form* located on the Graduate School web site: <http://gradschool.missouri.edu/forms-downloads/repository/cert-plan.pdf>. The form asks for a list of courses taken by the student to fulfill the certificate requirements. The form must be signed by the student, the CDiG executive director and the graduate dean. For students completing a professional degree, a copy of the student's approved degree program must be attached to the certificate application form when submitting it for the CDiG executive director's approval. The form then must be submitted to the Graduate School, 210 Jesse Hall.

#### **II. CDiG GRADUATE DEGREE DEPENDENT CERTIFICATE (for students completing a graduate degree)**

The Center for the Digital Globe, established by the College of Business, School of Journalism, School of Law and Department of Textile and Apparel Management in the College of Human Environmental Sciences, offers a 12 credit hour interdepartmental certificate to graduate students of the University of Missouri. The certificate program supplements the students' graduate studies within the various colleges and schools that make up the University. This is not a degree-granting program. Instead, the certificate attests to the students' successful completion of a required course of study with emphasis on the managerial, theoretical and policy-related issues associated with digital media, electronic commerce and globalization. Students receiving the graduate degree dependent certificate will have demonstrated competencies in:

*Technology* - Students need not have achieved mastery of specific engineering, programming or application skills. Instead, the students

must demonstrate a working understanding of how digital technologies function.

*Global Communication* - One of the primary characteristics of digital technologies, and particularly the Internet, are their function as worldwide communications media. Whether from the perspective of journalism, business or the law, the impact of these new communications channels has been substantial. Students should achieve an understanding of how new media are different from print or broadcast media and the consequences of those differences.

*Business* - Students should be well grounded in the principles, opportunities and ethical uses of electronic commerce and its impact on journalism, law and commercial practices.

*Culture and Society* - Digital media raise recurrent questions which call for political and social solutions. Students should be able to understand the broader issues raised by technological change and be prepared to take positions of leadership as such issues present themselves. Examples of such issues are questions of globalization, political boundaries, access, ownership and uses of information, marketing, etc.

To achieve the goals of the certificate and assure its value to students, the University and prospective employers or donors, the certificate program enjoys certain characteristics. Perhaps most fundamental is the interdisciplinary nature of the program. While each department has the capability of offering a course emphasis, track or intra-departmental certificates to students in the area of technology and commerce, one of the fundamental concepts underlying the Center is the value and necessity of approaching these issues from the perspective of various disciplines. With these principles in mind, the program has been designed to assure that the interdisciplinary character of the course of work will be emphasized. The required course work compels students to come together for an interdisciplinary introduction to their studies and permits them to work separately and within their respective disciplines for further study. Students come together for a concluding experience that involves working collectively through a case study.

#### **Academic Requirements for the Graduate Degree Dependent Certificate**

Graduate degree seeking students who want to pursue a Center for the Digital Globe Certificate must complete a *Change of Program Form* and be formally admitted to the certificate program. Print the *Change of Program Form* located on the Graduate School web site: <http://gradschool.missouri.edu/forms-downloads/repository/change-degree.pdf>. See your graduate faculty advisor to process the form.

**SPECIAL NOTE:** No more than six of the twelve credits necessary for the CDiG Graduate Degree Dependent Certificate may count toward the graduate degree.

**Eligibility:** Students who have completed their baccalaureate studies and are enrolled in a master's, doctoral or professional program and working toward a graduate degree at the University of Missouri.

**Credits:** At least 12 eligible credit hours, consisting of an introductory, interdisciplinary course (Management 8100), 6 credit hours in two or more eligible graduate courses, and a concluding seminar/research project course (Journalism 8052). The course of work for certificate students is more specifically described as:

1. Management 8100: Exploring the Digital Globe, 3 credits (offered fall semesters). This inter-departmental course introduces students to the impacts of technological change and globalization from the perspective of business, law and journalism. Students are introduced to electronic

commerce, digitization and globalization to prepare them to respond to the challenges of the digital globe. Students do not acquire specific technological skills; they acquire a working understanding of how digital technologies function. The course is taught by faculty from the journalism, business and law schools, and from the Department of Textile and Apparel Management of the College of Human Environmental Sciences. Visiting speakers, including speakers presenting programs for the Center for the Digital Globe, meet with the class to share their research and experience.

2. 6 credits of graduate course work - The courses taken to satisfy this requirement are those that have been approved by the Center's faculty in consultation with the academic programs that offer the courses. The approved courses are graduate level courses that address one or more of the competencies specified above. See the Center for the Digital Globe's graduate courses page <http://cdig.missouri.edu/coursesgrad.html> for a list of approved courses to meet this requirement.

3. Journalism 8052: Case Studies in the Digital Globe, 3 credits (offered fall and winter semesters). The course is designed to further develop the levels of understanding and skills obtained in previous course work. In this class, students will achieve a better understanding of how new media are different from print or broadcast media and the consequences of those differences. Students are introduced to the principles, opportunities and ethical use of electronic commerce. Students critically analyze issues raised by technological change, including globalization, political boundaries, access, ownership and uses of information, marketing, etc. As with the introductory class, this course is taught by faculty from a variety of departments. Visiting speakers, including speakers presenting programs for the Center for the Digital Globe, meet with the class to share their research and experience.

4. Grades: Students must maintain a minimum grade of 3.0 or equivalent in each course to receive credit toward completion of the certificate.

#### Graduate Degree Dependent Certificate Summary and Final Application for Certificate

To be eligible for the graduate degree dependent certificate in the Center for the Digital Globe, students are required to take four courses: two courses offered through Center for the Digital Globe and two electives. The required courses are Management 8100 (Exploring the Digital Globe) and Journalism 8052 (Case Studies in the Digital Globe). The two electives should be determined in consultation with the student's graduate advisor. **SPECIAL NOTE:** No more than six of the twelve credits necessary for the CDiG Graduate Degree Dependent Certificate may count toward the graduate degree. To receive the certificate upon completion of their program, students must print and fill out the *Application for a Graduate Certificate Form* located on the Graduate School web site: <http://gradschool.missouri.edu/forms-downloads/repository/cert-plan.pdf> The form asks for a list of courses taken by the student to fulfill the certificate requirements. The form must be signed by the student, the CDiG executive director and graduate dean. A copy of the student's approved graduate degree program must be attached to the certificate application form when submitting it for the CDiG executive director's approval. The form then must be submitted to the Graduate School, 210 Jesse Hall.

#### FOR ADDITIONAL INFORMATION:

See the Center for the Digital Globe web site for further program details, including contact information, courses, affiliated faculty list, etc.

<http://cdig.missouri.edu/certificatesgrad.html>

## Graduate Minor in College Teaching

Approximately 75 percent of faculty positions in the United States are at institutions where the importance of teaching and professional service is equal to or greater than the emphasis on research. The Minor in College Teaching, available to all MU graduate degree-seeking students, demonstrates your preparation as an effective teacher to potential employers.

The Minor in College Teaching (MCT) requires 9 credit hours. This includes a 3-hour core course, a teaching practicum, plus 3-6 elective hours. It is highly recommended that students enroll in ED\_LPA 9456, but it is not a requirement.

#### Core Required Courses - students must complete one of the following:

ED_LPA 9448	College Teaching	3
AG_ED 8350	College Teaching of Agriculture, Food and Natural Resources	3
BIO_SC 8724	College Science Teaching	3
LTC 8724	College Science Teaching	3

#### Teaching Practicum

Students must complete a teaching practicum and portfolio, but do not have to officially register for a course in order to complete the requirement. Students opting to enroll in a course can choose from the options below.

#### Teaching Practicum - options for enrollment

AG_ED 8995	College Teaching Practicum	3
ED_LPA 9481	Internship in Educational Leadership and Policy Analysis	1-99.9
H_D_FS 9100	Teaching Practicum	2-6
NURSE 8950	Teaching Nursing Practicum	4
PHIL 8210	Teaching of Philosophy I	1
SPC_ED 9940	Internship: College Teaching in Special Education	3
PSYCH 9910	Teaching of Psychology Practicum	1-99

#### Elective Courses

Teaching with Technology Elective Courses		
IS_LT 7822	College Teaching with Technology I	1
IS_LT 7823	College Teaching with Technology II	1
Disciplinary Teaching Elective Courses		
AG_ED 8330	Advanced Methods of Teaching	3
AG_ED 8350	College Teaching of Agriculture, Food and Natural Resources	3
AN_SCI 8725	Science Outreach: Public Understanding of Science	1-2
BIO_SC 8725	Science Outreach: Public Understanding of Science	1-2
LTC_V 7810	Technology and Industry Education Methods	3
LTC_V 7830	Curriculum Content in Marketing Education	3
LTC_V 7840	Methods of Teaching Marketing Education	3
LTC 8712	Inquiry and the Science Curriculum	3

LTC 8900	Seminar in Curriculum and Instruction	1-3
CLASS 7700	Advanced Study in the Teaching of the Classics	3
ESC_PS 7100	Theories and Applications of Educational Psychology	3
ESC_PS 7115	Human Learning	3
ESC_PS 8320	Advanced Human Learning	3
ESC_PS 8350	Cognition, Learning and Instruction	3
ED_LPA 9440	Race, Gender, and Ethnicity in Higher Education	3
ED_LPA 9441	The Adult Learner	3
ED_LPA 9442	Curriculum Philosophy and Development in Higher Education	3
ED_LPA 9447	College Student Culture and Environment	3
ED_LPA 9449	History of Higher Education in the United States	3
ED_LPA 9455	The Community College	3
ED_LPA 9456	The Professoriate	3
ED_LPA 9459	Comparative and International Education	3
ENGLSH 7650	Principles of Teaching English as a Second Language	3
IS_LT 9471	Instructional Systems Design	3
NURSE 8850	Teaching Nursing	3
PHIL 8210	Teaching of Philosophy I	1
PHIL 8220	Teaching of Philosophy II	1
PHYSCS 8040	Study of Techniques of Teaching College Physics	1-3
PHYSCS 8350	Science Outreach: Public Understanding of Science	1-2
PSYCH 9150	Human Learning and Memory	3
FRENCH 7120	Foreign Language Teaching Methodology	3
or SPAN 7120	Foreign Language Teaching Methodology	3
SPC_ED 7375	Cross Categorical Special Education	3

For additional information, contact:

Ashley Siebenaler, Senior Academic Advisor  
 Graduate School  
 210 Jesse Hall  
 Columbia, MO 65211  
 email: siebenalera@missouri.edu  
 phone: 573-882-8006

## Graduate Certificate in Community Processes

The Graduate Certificate in Community Processes offers graduate students and professionals a unique opportunity to develop expertise in how spatial and relational communities function in today's society: their processes for forming, for maintaining the community and for achieving community objectives. A vital part of the certificate is acquiring applied skills in community facilitation processes or community analytical processes.

For more information please contact:  
 Dr. Judith Stallmann  
 231 Gentry Hall  
 phone: 573-882-6455  
 email: stallmannj@missouri.edu

## Graduate Certificate in Conservation Biology

A certificate in Conservation Biology from the University of Missouri shows that you have interdisciplinary coursework and experience not already met by any single degree program at MU. As Conservation Biology is an interdisciplinary science the curriculum for our certificate provides coursework and experience beyond what is offered in a single degree program. The interdisciplinary nature of the curriculum is designed to help you reach a higher level of competence in conservation biology.

To accomplish this goal, the program has 2 required components:

1. Interdisciplinary coursework that includes at least one course each from the categories of Natural Sciences, Techniques and Policy/Social Sciences with at least 3 credits are from outside your degree program. A list of approved courses ([http://www.conservbio.missouri.edu/forms&papers/Courses%20Fall%2009\\_updated.pdf](http://www.conservbio.missouri.edu/forms&papers/Courses%20Fall%2009_updated.pdf)) is available on the Conservation Biology website.
  - Ph.D. students: 15 credit hours of coursework at the 7000, 8000 or 9000 level, 12 of which may overlap with the degree course of study
  - M.S./M.A. students: 12 credit hours of coursework at the 7000, 8000 or 9000 level, all of which may overlap with the degree course of study
  - Coursework must include one course each from the following areas: Science, Techniques and Policy (See approved course list)
2. Practical experience through an internship that falls outside your discipline
  - 160 hours of an internship exploring an area complementary to the student's conservation career goals
  - Designed and completed under the guidance of a mentor other than your major advisor
  - Results in a tangible product (e.g. paper, publication, presentation)

## Graduate Certificate in European Union Studies

The Graduate Certificate in European Union Studies requires students to take 12 hours of coursework.

### Required Courses

PUB_AF 8850	Policies and Institutions of the European Union	3
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### Specialization Courses

The rest of the hours should come from courses that have a strong EU focus	9
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For more information contact Fritz Cropp at the Transatlantic Center (<http://eu.missouri.edu>).

## Graduate Minor in Gerontology

The graduate minor in gerontology consists of nine to 15 hours of aging-related course work approved as a graduate minor by the student's

department/discipline. The MU Interdisciplinary Center on Aging will collaborate and provide assistance to both the student and his or her adviser. Twenty-three courses in more than 10 disciplines can be supplemented by independent and topics courses. Mentoring from experienced researchers on interdisciplinary research teams contributes to the learning curve of students specializing in aging studies. More than 40 teams are located throughout the university. Students are encouraged to contact the Interdisciplinary Center on Aging for help connecting with these productive groups of scholars.

For additional information, contact:

MU Interdisciplinary Center on Aging  
 M245A Medical Sciences Building  
 Columbia, MO 65212  
 phone: 573-884-3337  
 email: [aging@missouri.edu](mailto:aging@missouri.edu)  
 website: <http://medicine.missouri.edu/aging/home.html>

## Graduate Certificate in Health Ethics

The certificate program is ideal for working professionals such as physicians, nurses, healthcare administrators, those serving on hospital ethics committees or considering such health ethics issues in their daily employment, and students in the health professions. The certificate program will help the learner develop an understanding of the ethical issues related to health and healthcare and will foster skill in analyzing and resolving ethical problems and conflicts in the healthcare environment.

For more information, contact:

Veronica Kramer  
 Coordinator of Student Recruitment & Admissions  
 (573) 884-0698  
[kramerv@missouri.edu](mailto:kramerv@missouri.edu)

## Graduate Minor in International Development

The requirements for acceptance and completion of work for the minor are as follows:

1. The student must be enrolled as a master's or PhD candidate in good standing at MU.
2. A formal request to be included in the minor must be made in advance of taking courses, to the director, Associate Professor Corinne Valdivia, 214D Mumford Hall. This request should be approved by the student's adviser. A copy will be sent to the Graduate School.
3. Once the student is admitted to the minor, s/he should seek advisement from the director and his/her adviser concerning which courses to take. The plan of study must be submitted to the Graduate School no later than the semester before graduation.
4. The student must satisfactorily complete a total of twelve credit hours in courses dealing with Third World Development. At least six of the twelve hours must be taken in at least two departments outside the student's home department.

5. Foreign language courses are not required, but students who are not fluent in a second language are strongly encouraged to take intensive language courses to develop competency. Credit for language courses does not count toward the twelve hours of credit required for the minor.
6. When the required twelve hours of credit are completed from approved courses, the student's adviser should inform the director, who will in turn inform the policy committee which governs the operation of the minor. This should be done in advance of the student's orals to give members of the policy committee an opportunity to sit in on the examining committee if they so desire.
7. The certificate is only awarded after all departmental and Graduate School requirements for the advanced degree have been satisfied. An overall grade point average of 3.0 is required for the twelve hours within the minor.

### Preapproved course options:

AG_EC 8430	International Agricultural Development Policy	3
ECONOM 7325	The International Monetary System	3
ECONOM 7326	Economics of International Trade	3
ECONOM 7360	Economic Development	3
ECONOM 9460	Development Economics	3
ED_LPA 9459	Comparative and International Education	3
HIST 8445	Studies in World Environmental History	3
JOURN 7658	International Journalism	3
JOURN 7656	International News Media Systems	3
POL_SC 9610	Latin American Politics	3
POL_SC 9650	African Politics	3
POL_SC 9790	Seminar in Comparative Politics	3
PUB_AF 8630	Organizational Change in a Community and Global Context	3
RU_SOC 8287	Seminar on Sustainable Development	3
RU_SOC 7335	Social Change and Development	3
RU_SOC 7445	Seminar on Issues in the Sociology of Agriculture and Natural Resources	3
RU_SOC 9480	Community Survey Research	3
SOC_WK 7455	Latino/a Immigrants and Receiving Communities	3
SOCIOL 7230	Women, Development and Globalization	3
T_A_M 9150	International Trade in Textiles and Apparel	3
ANTHRO 7300	Comparative Social Organization	3
ANTHRO 7320	Ecological and Environmental Anthropology	3
Selected Departments 7085/8085 Problems		1-3
Selected Departments 7001/8001 Advanced Topics		

## Graduate Certificate in Society and Ecosystems

### Contact

**Sandy Rikoon, Ph.D.**  
 Coordinator Society and Ecosystems Program  
 200 A Gentry Hall  
 University of Missouri-Columbia  
 Columbia, MO 65211  
 Telephone: 573-882-0861

Email: rikoobj@missouri.edu

## Goals

Understanding the complex and dynamic interactions between human activities and natural ecosystems is essential for achieving sustainable development. Developing this understanding in the next generation of scientists, educators and resource management professionals is the primary goal of the University of Missouri's interdisciplinary graduate certificate program in Society and Ecosystems.

The Society and Ecosystems Program (SEP) is a unique interdisciplinary program that prepares students for careers with private and public organizations through advanced graduate level training and research. The certificate program is designed for students with undergraduate-graduate training in agriculture, biology, business administration, economics, engineering, fisheries and wildlife, forestry, geography, geology, rural sociology and related disciplines. Students who are in a graduate or professional program in their area of specialization take two integrated courses and complete a thesis or dissertation that applies more than one discipline. The program is designed to enhance the student's familiarity with disciplinary and interdisciplinary concepts and principles from the social and natural sciences and humanities.

The goal of the program is to develop critical thinking and analytical skills related to:

- sustainable natural resource and environmental management and planning,
- dynamic interactions between social, economic and ecological systems,
- quantitative-qualitative analysis of individual and social behavior,
- cultural interpretations of natural resource and environmental issues, and
- application of knowledge gained in the above areas to the evaluation of public policy.

## Admission

Admission to the SEP is open to students who have been admitted to a graduate or professional program in the University of Missouri-Columbia, have undergraduate-graduate training in natural and social sciences, and have interest in interdisciplinary studies. Persons interested in the SEP should contact the Coordinator.

## Curriculum

Students must be enrolled in a regular academic department and working toward completion of a graduate degree in a natural resource-related discipline. All students are required to take the following core courses:

a) six credits from a department/unit other than the one in which the student is enrolled, b) a three-credit interdisciplinary course on the human dimensions of ecosystem management, and c) three credits of a research seminar in Society and Ecosystems.

The interdisciplinary course examines the sociocultural, economic, ethical and biophysical aspects of ecosystem management with emphasis on the human dimension. It is normally taken during the student's first year. The primary objective of this course is to develop a student's appreciation of a) major issues in the society-ecosystems nexus, b) roles of various disciplines in understanding and resolving socioeconomic-ecological issues, and c) systems analysis. A course requirement is for students to work in multidisciplinary teams to evaluate human effects on and

responses to global warming, loss of biodiversity, water pollution, and other contemporary natural-environmental resource issues.

The research seminar exposes students to interdisciplinary research on the interactions between social, economic and ecological systems. Emphasis is placed on the impacts of economic activity, population growth, technology and public policy on the functioning and resilience of ecological systems, and how ecological systems support socioeconomic development at the local, regional and global scales. Speakers for the research seminar include faculty, students, visiting scholars, and private and public officials. Students are expected to present their thesis or dissertation research at the research seminar. Thesis and dissertation research must be conducted on a topic related to the interactions between society and ecosystems. Students completing the SEP receive a certificate in Society and Ecosystems. Recognition of the certificate appears on the student's transcript.

## Advisory Committee

The student's plan of study and research topic are selected in collaboration with an advisory committee established in accordance with the requirements of the student's department/unit and the Graduate School. The advisory committee includes at least one faculty member affiliated with the SEP. Graduate school permission is required in cases where it is highly desirable for the three faculty members comprising a masters student's advisory committee to be from different departments/units.



## Honors College

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### Contact Information

Nancy West, Director  
Heidi Appel, Associate Director  
Monika Fischer, Associate Director  
Steven Keller, Associate Director  
Gregory Triplett, Associate Director  
(573) 882-3893  
<http://honors.missouri.edu>  
211 Lowry Hall

## Honors College

The Honors College is a community of motivated, high-achieving students from all the undergraduate colleges at the University of Missouri. It is designed to offer an innovative and challenging academic experience, personal advising, and enrichment programs specially designed for honors students in research, service learning, internships, and study abroad. The Honors College gives students maximum flexibility in order to serve their individual interests. Honors courses, taught by many of the University's best professors, encourage close interaction between students and faculty and allow students to experience a small-college atmosphere within a large university.

Opportunities in the Honors College are described below.

- **Honors Courses** (GN HON) are limited to honors-eligible students. Honors courses fall into three categories:
  - Honors sections of regularly offered courses
  - Departmental honors and research courses
  - Special Honors College courses
- **The four-semester Humanities Series**, which provides an interdisciplinary approach to literature, philosophy, art history, art, religious studies, archaeology and music.
- **The four-semester Human Sciences Series** which provides an interdisciplinary approach to the social and behavioral sciences, including psychology, cultural geography, sociology, family studies, economics, linguistics, communications, and h
- **The two-semester Science Series** which provides an interdisciplinary, hands-on laboratory science course for non-science majors designed to introduce students to the methods, range, and big ideas of scientific knowledge.
- **Honors Discussion Groups** are small, informal discussion groups focused on special topics.
- **Honors Colloquia** are interdisciplinary and experimental courses.
- **Honors Tutorials** are informal discussion groups of 2-5 students and a faculty member. Tutorials are based on the Oxford-style of learning and typically take place in the faculty member's office or another non-classroom setting.
- **Independent Study** opportunities allow students to study one-on-one with a faculty member.
- **Honors Preceptorships** provide special student-faculty research opportunities. The Honors College helps arrange special research relationships between talented students and professors.
- **Learning by Contract** allows honors students to take a non-honors course for honors credit. The student enters into a contract with the professor to complete work beyond the course requirements. Forms are available online.

## Honors College Admissions

### Fully-Admitted Incoming Freshmen

Incoming freshmen are eligible for automatic admission to the Honors College upon submission of an application, if they have 29 or higher on the ACT or 1280 on the SAT and are in the top 10 percent of their high school graduating class. Students from high schools that do not rank will be automatically eligible if their core GPA is greater than 3.75. Incoming freshmen who do not meet both of the admissions criteria are required to submit an essay as part of their application. Essays are evaluated on an individual basis. Specific information on the requirements for the essay can be found on the website ([honors.missouri.edu](http://honors.missouri.edu)).

### Provisionally-Admitted Incoming Freshmen

Incoming freshmen who apply to the Honors College but who do not meet the automatic eligibility requirements may be given the opportunity to take one honors course during their first semester. Provisionally-admitted students may request permission to enroll in one additional honors course during the Early Registration period for spring semester. Students wishing to exercise this option should schedule an appointment to meet with the director of the Honors College during Early Registration.

Provisionally-admitted students cannot live in the Honors Learning Community or participate in honors Freshmen Interest Groups in student housing and are not assigned to the Honors College for advising until they are given full admission. Provisionally-admitted students are automatically given full admission to the Honors College if they have a 3.5 MU GPA at the end of their first semester. Provisionally-admitted students who do not make a 3.5 the first semester may remain enrolled in the early registered course for the following semester. These students can apply for admission any time after they have completed 30 credits and have a 3.5 MU GPA.

### Transfer Students

Transfer students are eligible to apply if they have at least 30 credits and a 3.5 cumulative GPA. The cumulative GPA, for the purpose of applying to the Honors College, is the calculated average of transfer work from all institutions the student has attended.

## Special Programs

### Service Learning

The Honors MU Community Engagement Project is a service-learning outreach program designed to assist members of the community and offer students problem-solving and leadership experiences. Service projects include mentoring at-risk adolescents, working with low-income preschool children, and investigating and providing service for local public health agencies. Students perform community service, participate in a seminar and complete research projects.

### Honors Housing

The Honors Learning Community brings together honors students of various academic orientations into intellectually and socially stimulating settings. Honors Students are not required to live in Honors Housing.

### Student Services

The Honors College offers one-on-one academic advising for all honors students. The Honors College also offers specialized advising for students planning a career in medicine, dentistry, optometry or podiatry. Pre-Health Professions advising through the Honors College provides a

comprehensive program that offers a variety of services to guide students through the academic and applications process necessary to become a health professional.

## **Program Requirements**

### **Maintaining Honors Eligibility**

#### **GPA Requirement**

Students must maintain a 3.0 MU GPA to remain in the Honors College. Students whose MU GPA is below 3.0 after fall semester receive a warning letter. Students whose MU GPA is below 3.0 after spring semester lose honors eligibility. Students wishing to reapply to the Honors College must meet the eligibility requirements for current students.

#### **Initial Course Requirements**

Students are required to complete two honors courses per year for the first two years. Students who are admitted for the second semester of their first year at MU must complete one course during the spring semester, and two courses the following year. All honors-designated courses will count toward this requirement including honors sequence courses, colloquia, honors sections of regularly offered courses (see departmental offerings), GN\_HON 1080H/ GN\_HON 2085H and GN\_HON 2950H/ GN\_HON 4950H, and Learning-by-Contract (up to 8 hours). The requirement is modified as follows for transfer students and MU students admitted after first semester.

#### **Continuing Course Requirements**

Students admitted after their first year must complete two courses the second year.

Students admitted after their second year must complete one course at any time before graduation.

Successful completion of this requirement is verified at the end of each spring semester. Students who have not taken the required number of courses lose honors eligibility.

#### **Honors Certificate Requirements**

Students who complete 20 credits in honors courses and have a 3.3 cumulative GPA are eligible for an Honors Certificate, which is also noted on their permanent transcript. All honors course work must be completed in the semester prior to graduation for a student to be eligible to participate in the Honors Commencement Ceremony.

#### **University Honors Designation**

Students who complete the Honors Certificate and a qualified departmental honors program will be eligible for this designation, which will be noted on their permanent transcript (see your department or the Honors College for information about departmental honors programs).

## **Faculty**

There are faculty from all disciplines who teach Honors College courses.

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## School of Law

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203 Hulston Hall  
Columbia, MO 65211-4190  
phone: 573-882-6042  
fax: 573-882-4984  
web: <http://law.missouri.edu>

**Welcome to the University of Missouri School of Law's online catalog for the 2013-2014 academic year.**

**Information in this searchable, interactive catalog is current as of May 2013. The next catalog will be made available in May 2014. In the interim, changes to the law school curriculum will be made on our website (<http://law.missouri.edu>).**

**Use the search box above or click on the left hand menus to navigate through the catalog. There is also a PDF version available through the "Print Options" link above.**

**Broken links inside the law school's online catalog may be reported by contacting [umclawweb@missouri.edu](mailto:umclawweb@missouri.edu).**

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The University of Missouri School of Law offers a collegial environment, reinforced by a small student body and a low faculty-student ratio. The intimacy of this setting, coupled with reasonable cost, consistently high bar passage rates, a network of alumni around the globe and access to top scholars in the legal world, make the School of Law one of the best values in the nation.

### Administration

Gary Myers, Dean  
Rafael Gely, Associate Dean for Academic Affairs  
Rigel C. Oliveri, Associate Dean for Faculty Research and Development  
Elisabeth E. Key, Assistant Dean for Career Development and Student Services  
Robert G. Bailey, Assistant Dean and Director of the Center for the Study of Dispute Resolution  
Randy J. Diamond, Director of Library and Technology Resources  
Alisha L. Rychnovsky, Manager of Business and Fiscal Operations  
Mark Langworthy, Senior Director of Development  
Casey Baker, Director of External Relations  
Michelle L. Heck, Director of Admissions and Financial Aid

### Mission Statement

The MU School of Law aspires to be the school of choice for outstanding students, both from Missouri and other states. As a national leader in the field of dispute resolution, we seek to complement a strong traditional curriculum with an orientation toward lawyering as a problem-solving endeavor. We strive to foster a diverse faculty of nationally recognized scholars who are committed to effective teaching, and to attract a student body with diverse experiences and views. We also strive to offer an intellectually rigorous and collegial environment for the study of law. Furthermore, we seek to graduate well-rounded lawyers who are sensitive to ethical issues, prepared to serve clients, and ready to be leaders in promoting justice.

### Academics

Known world-wide for its Center for the Study of Dispute Resolution, the School of Law's curriculum combines both traditional law school classes with an appreciation of the many dispute resolution techniques in which lawyers engage and includes a certificate program in the rapidly developing area of dispute resolution.

Mizzou Law students are required to complete 89 hours of law school classes in order to graduate. Following the prescribed first year, students are required to take Constitutional Law, Evidence, Criminal Procedure and Professional Responsibility. Several clinical and externship programs are available to upper level students, along with skills training in trial practice, negotiation, interviewing and counseling. The curriculum couples courses traditionally tested on the bar examination so that the law school can continue its long tradition of success on bar examinations nationwide, with cross disciplinary dual degree and certificate programs in several other areas. As a result, the law school's curriculum is appealing not only to those who want to engage in the traditional practice of law, but also to those who want to use their law degree as a stepping stone into other disciplines.

### Faculty

**Full Time Faculty** D. E. Abrams, R. G. Bailey, R. de R. Barondes, M. Berry, F. O. Bowman III, M. M. Beck, M. A. Cecil, M. Cherry, C. N. Conklin, D. D. Crouch, M. R. Daily, K. D. Dean, B. M. Desnoyer, R. L. Dessem, R. Diamond, M. Dragich, D. M. English, C. H. Esbeck, R. W. Freyeremuth, R. Gely, E. M. Hawley, J. D. Hawley, C. Henson, K. Johnson, P. Ladehoff, T. Lambert, J. Lande, I. Lee, J. Levin, P. J. Litton, M. A. Middleton, S. D. Mitchell, G. Myers, R. C. Oliveri, P. G. Peters Jr., R. C. Reuben, T. A. Rule, S. I. Strong, B. Trachtenberg, R. Uphoff, C. E. Wells

**Adjunct Faculty** M. Carney, J. P. Dandurand, S. A. Davidson, A. K. Drake, C. J. Dykhouse, R. C. Geary, C. Haden, R. J. Haslag, R. R. Hollinger, N. Jones, B. Kevin-Myers, J. R. Layton, L. J. Levine, H. Lowenstein, S. R. Maguffee, L. L. McMullen, D. D. Noce, W. R. Phillips, S. J. Read, J. Salinardi, L. A. Schneider, T. K. Stabenow, S. R. Stigall, G. Stratmann, K. D. Whitman, J. T. Woods

**Professor Emeritus** P. N. Davis, W. B. Fisch, D. A. Fischer, E. H. Hunvald Jr., D. A. Whitman

The catalog also has a cumulative listing of all faculty at the University of Missouri (p. 1174) that includes information on the faculty member's highest degree attained.

Detailed faculty profiles for the School of Law faculty is also available at <http://law.missouri.edu/faculty/directory/>.

### Academic Policies

Below is a listing of policies that only apply to students in the School of Law. Be sure to also check the listing of the University's Academic Policies (p. 657) for policies that apply to all students.

*The policies and procedures of the MU School of Law are revised on a regular basis. Provisions regarding such policies and procedures contained on our website are subject to change without notice. If you have questions or note errors or omissions, please contact the Associate Dean for Academic Affairs. All statements concerning requirements, prerequisites, conditions or other matters are for informational purposes*

only, and are subject to change without notice. They are not to be regarded as offers to contract.

- Academic Progress (p. 659)
- Attendance (p. 661)
- Computer Policies (p. 662)
- Course-Load Rules (p. 663)
- Credit for Non-Law Courses (p. 663)
- Disability Accommodations (p. 663)
- Dismissal and Probation (p. 664)
- Examinations (p. 668)
- Grades & Ranks (p. 675)
- Grievances (p. 677)
- Residency (p. 682)
- Student Conduct (p. 683)
- Student Employment (p. 683)
- Transfer Credit (p. 686)
- Withdrawal from the University (p. 688)

## Juris Doctor (JD)

Upon favorable recommendation of the Faculty of Law, the degree of Juris Doctor will be conferred upon a student who:

- a. Has pursued in residence the full-time study of law for at least three academic years (or the equivalent), two of which must have been completed in this School. A full-time student is one who is registered for credit in 12 or more hours in a semester or six or more hours in a summer session. A student registered for less than 12 hours in a semester or less than six in two summer sessions, will receive proportional residence credit. The maximum number of residency credits obtainable in any one summer session shall be seven, provided that for purposes of accelerated graduation (in less than three academic years) no more than twelve residency credits may be obtained in summer sessions.
- b. Has received a passing grade in all required courses, except required courses which have been waived.
- c. Has received passing grades in law courses aggregating at least 89 credits and has a numerical grade point average of at least 77.5; and
- d. Has received an undergraduate degree before or concurrently with his or her graduation from law school.

[Note: The summer school residency provisions allow a student to combine two six-hour summer sessions or a seven-hour summer session with a five-hour summer session and obtain the equivalent of a full semester's residency credit.]

## Curriculum

- **Required Courses**
- **Writing Requirement**
- **Professional Perspectives Requirement**

## Required Courses

### First Year

LAW 5010	Civil Procedure I	3
LAW 5015	Civil Procedure II	2
LAW 5020	Contracts I	3
LAW 5025	Contracts II	3
LAW 5035	Criminal Law	4
LAW 5050	Property	5
LAW 5070	Torts	5
LAW 5080	Legal Research and Writing	2
LAW 5085	Advocacy and Research	2
LAW 5090	Legal Reasoning ((if assigned))	1
LAW 5095	Lawyering: Problem Solving and Dispute Resolution	2

### Second Year

LAW 5220	Constitutional Law	4
LAW 5260	Evidence	4

### Second or Third Year

LAW 5240	Criminal Procedure	3
LAW 5280	Professional Responsibility	3

## Completion of a Writing Requirement for students who first matriculated in or after Fall 2006

1. Every J.D. student must complete a rigorous upper-level writing experience in either the second or third year of study.
2. A "rigorous writing experience" means an experience that culminates in an individually authored paper of at least 20 pages (double-spaced), based on independent research, through a process that includes preparation of a substantial draft, review and feedback by a faculty member, and revision of the draft.
3. Any of the following activities may satisfy the upper-level writing requirement, provided that the activity meets the definition of a "rigorous writing experience" in the individual case:
  - a. completion of any course designated as a writing course,
  - b. completion of a writing section attached to a traditional course,
  - c. completion of an independent research project under L5875 Research, or
  - d. membership on one of the journals of the University of Missouri School of Law.
4. A "designated writing course" is one in which all students complete a rigorous writing experience as defined in section (2) above and in which, in lieu of a final examination, a substantial portion of the final grade for the course is based on that writing.
5. In every case, the supervising full-time faculty member must certify that the writing requirement has been satisfied before a notation will be made in the student's record.
6. As stated in the Student Handbook, "[g]rading is done anonymously in all classes where it is possible." With the exception of Independent Research, if grading is to be done other than anonymously, the syllabus shall so state.

## Professional Perspectives Requirement

- I As lawyers, each of you will be required to complete a required number of Continuing Legal Education requirements each year.
- II As law students at MU, you have a similar requirement.
- III You **MUST** complete a certain number of Professional Perspective hours each year to be eligible to graduate from this law school.
- IV Professional Perspective's hours are designed to further your legal knowledge by presenting you with information about current legal events; from current practitioners, including judges; and about other legal or legally-related matters. These hours are also designed to present you with needed information about career planning, the job market, and placement;
  - A. As a result, matters counting for Professional Perspectives credit are broken into two categories:
  - B. Professional Perspectives are those programs that give students a new or different prospective on the law or its practice;
  - C. Career Component credits are those programs that give students information about career planning and placement;
  - D. Any program approved for credit will designate the category applicable to that program;
- V Matters qualifying for Professional Perspectives credit will appear on the School of Law Calendar. It is your responsibility to select the events you wish to attend, within the guidelines set out below;
- VI Many programs sponsored by the School of Law automatically qualify for Professional Perspectives credit. When listed on the law school calendar, qualifying programs are so designated.
- VII Programs sponsored by student or other groups may qualify for Professional Perspectives credit, but **ONLY** if an application for credit is filed, in advance, of the event, with the Associate Dean. Application forms are available in the Dean's Office.
- VIII In every event for which Professional Perspectives credit is offered **MUST** be overseen by a responsible person who agrees to maintain an attendance record for that event.
- IX Because Professional Perspectives credit is required, it is an event for which attendance counts. As a result, please note that it is an offense under the Honor Code to misrepresent one's own or another attendance or absence from such an event. This would include signing in for an event and then leaving before the conclusion of that event.
- X The Professional Perspectives requirement for each class of students is as follows:
  - A. For First Year Law Students:
    - 1. 1 Professional Perspectives program in the fall semester;
    - 2. 1 Career Component program in the fall semester;
    - 3. 1 Professional Perspectives program in the winter semester;
    - 4. 1 Career Component program in the winter semester;
  - B. For Second and Third Year Law Students:
    - 1. 2 Programs each semester;
    - 2. At least two of the programs during the year **MUST** be for general Professional Perspectives credit;
    - 3. At least one program during the year **MUST** be for the Career Component credit.

The above checklist ([http://catalog.missouri.edu/schooloflaw/jurisdoctor/Degree\\_Requirements\\_Checklist.pdf](http://catalog.missouri.edu/schooloflaw/jurisdoctor/Degree_Requirements_Checklist.pdf)) is also available in PDF.

## Experiential Opportunities

The School of Law recognizes the importance of providing students with opportunities to apply the knowledge they receive in the classroom in "real-life" situations. Over their course of study, students have the opportunity to enroll in clinical programs or practicums in criminal prosecution, family violence, mediation, the state legislature, landlord/tenant law and the wrongly convicted. Additional details are available from the School of Law at <http://www.law.missouri.edu/academics/clinical.html>.

In addition to these clinical opportunities, students can participate in our extensive externship program. In this program, students work under the supervision of a lawyer or judge in a public law office, government agency or not for profit organization or for an attorney in private practice engaged in pro bono work. Additional details are available from the School of Law at <http://www.law.missouri.edu/academics/externships.html>.

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## Master of Laws (LLM)

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The Master of Laws degree is offered through a joint effort of the Graduate School and the School of Law. For detailed information on this program, consult the Graduate catalog (p. 603).

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## JD Certificate

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### MU Certificate in Dispute Resolution

Clients and society today need and expect much more than traditional advocacy from their lawyers. Modern lawyers need to be able to address legal problems in ways that accommodate a variety of needs, goals and values, in addition to vindicating legal rights. As a result, today's lawyer must have the knowledge, skills and perspectives not only to advocate in the courtroom, but to participate in such processes as client counseling, negotiation, mediation, arbitration and creative problem-solving.

The MU Certificate in Dispute Resolution is designed to foster such learning in students by providing the opportunity to work with some of the nation's leading dispute resolution scholars and practitioners. The MU School of Law has been ranked No. 1 in dispute resolution by U.S. News and World Report since 1999, and has more full-time faculty specializing in dispute resolution than any other law school.

This certificate program will give students an advantage in addressing the complex challenges of today's legal environment.

### Requirements

To receive a Certificate in Dispute Resolution from the MU School of Law, a J.D. student must take at least 10-11 credit hours of dispute resolution courses approved by the Law School. Eight of those credit hours are required core program courses and provide students with a basic understanding of the theory, skills and practice of dispute resolution. Students must take at least 2-3 additional elective hours from among the courses approved for the Certificate program.

Additional details and a list of courses satisfying the certificate requirements are available from the School of Law at <http://www.law.missouri.edu/academics/certificates/resolution.html>.

## Additional Academic Programs - Law

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Students in the School of Law have a wide variety of additional academic options before them, including a number of other degree and certificate programs available at the University of Missouri that can make a good accompaniment to the J.D. Below is a description of some of those options.

### Certificates

- Center for the Digital Globe
- European Union

### Dual/Concurrent Degrees

- Business Administration (Masters)
- Economics (Masters)
- Educational Leadership & Policy Analysis (Masters)
- Health Administration (Masters)
- Human Development & Family Studies (Masters)
- Journalism (Masters)
- Journalism (Doctorate)
- Library & Information Science (Masters)
- Personal Financial Planning (Masters)
- Public Affairs (Masters)

### Certificates:

### Center for the Digital Globe (Certificate)

The Center for the Digital Globe (<http://cdig.missouri.edu>) (CDiG), established by the College of Business, School of Journalism, School of Law, and Department of Textile and Apparel Management in the College of Human Environmental Sciences, offers an interdepartmental certificate to graduate students of the University of Missouri-Columbia. The certificate program supplements the students' graduate studies within the various colleges and schools that make up the University. This is not a degree-granting program. Instead, the certificate attests to the students' successful completion of a required course of study with emphasis on the managerial, theoretical and policy-related issues associated with digital media, electronic commerce and globalization.

### European Union (Certificate)

Designed to complement existing degrees, the Graduate Certificate Program (p. 638) consists of 12 credit hours of study to be completed in a variety of settings over four semesters. A portion of the coursework takes place via the electronic classroom, allowing students to pursue their Certificate while maintaining work responsibilities or completing other degree programs. Students typically begin their studies during the winter semester, though the program is flexible to accommodate different scheduling needs.

### Dual/Concurrent Degrees:

### Business Administration (Masters)

Students completing the Law and Business course of study will be eligible to receive the JD degree from the School of Law and the MBA degree from the School of Business. This course of study may be completed in four years. Normally, students require three years to complete the requirements for the JD degree and two years to complete the requirements for the MBA degree.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/mba-business.shtml>.

### Economics (Masters)

The Department of Economics and the School of Law offer an integrated program in which students may obtain both an MA degree in economics and a JD degree from the School of Law. Although an MA degree in economics normally requires two years of study, and a JD requires three, many students will be able to complete the program in four years.

The program meets requirements for the JD degree with 45 credit hours in required courses, 38 credit hours in elective courses within the School of Law, and 6 elective credit hours in economics, for a total of 89 credit hours. Requirements for the MA degree in economics are met with 24 credit hours of courses in the Department of Economics and 6 elective credit hours within the school of Law. The detailed program of study in economics is also subject to approval by the student's advisor in the Department of Economics and by the Director of Graduate Studies in Economics.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/ma-economics.shtml>.

### Educational Leadership & Policy Analysis (Masters)

With and Emphasis in Higher Education

The College of Education's Department of Educational Leadership & Policy Analysis and the School of Law offer an integrated program in which students may obtain both an MA degree in higher education with a concentration in general higher education administration and a JD degree from the School of Law. Although an MA degree in higher and continuing education normally requires two years of study, and a JD requires three, many students will be able to complete the program in four years.

The program meets requirements for the JD degree with 45 credit hours in required courses, 38 credit hours in elective courses within the School of Law, and 6 elective credit hours in education, for a total of 89 credit hours. Requirements for the MA degree in higher and continuing education are met with 24 credit hours of courses in the Department of Educational Leadership & Policy Analysis and 9 elective credit hours within the School of Law. The detailed program of study in education is also subject to approval by the student's advisor in the Department of Educational Leadership & Policy Analysis and by the Director of Graduate Studies.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/ma-educational.shtml>.

## Health Administration (Masters)

Students completing this course of study will be eligible to receive the JD degree from the School of Law and the MHA degree from the Health Management and Informatics graduate program. This course of study may be completed in four years and an additional summer session. Normally, students require three years to complete the requirements for the JD degree and two years to complete the requirements for the MHA degree.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/mha-health-admin.shtml>.

## Human Development & Family Studies (Masters)

The Department of Human Development and Family Studies and the School of Law offer an integrated program in which students may obtain both a JD degree from the School of Law and an MS or MA degree in Human Development and Family Studies. Although a Master's degree normally requires two years of study, and a JD requires three, many students will be able to complete the program in four years.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/mams-human-dev.shtml>.

## Journalism (Masters)

The School of Journalism and the School of Law offer an integrated program in which students may obtain both an MA degree in journalism and a J.D. degree in law. This program is especially suitable for students interested in enhancing their competencies, qualifications, and career options through the successful completion of two complementary professional programs. Although an MA degree in journalism normally requires two years of study, and a J.D. requires three, many students will be able to complete the full program in four years.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/ma-journalism.shtml>.

## Journalism (Doctorate)

The University of Missouri-Columbia School of Journalism and School of Law offer an integrated program for students seeking both a Ph.D. degree in journalism and a J.D. degree in law. Students should consider this program if they are interested in teaching or in senior-level practice or policy work in either of these fields, nationally or internationally. Although a Ph.D. degree in journalism normally requires three years of study, and a J.D. requires three, students may be able to complete the full program in as few as five years.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/phd-journalism.shtml>.

## Library & Information Science (Masters)

The School of Information Science and Learning Technologies (SISLT) and the School of Law offer an integrated program in which students may obtain both an MA degree in library and information science from SISLT and a JD degree from the School of Law. Although an MA degree in Information Science and Learning Technology with an emphasis in

Library and Science normally requires two years of study, and a JD requires three, many students will be able to complete the program in four years.

The program meets requirements for the JD degree with 45 credit hours in required courses, 38 credit hours in elective courses within the School of Law, and 6 elective credit hours in library and information science, for a total of 89 credit hours. Requirements for the MA degree in library and information science are met with 36 credit hours of courses within SISLT and 6 elective credit hours within the school of Law. The detailed program of study in library and information science is also subject to approval by the student's SISLT advisor.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/mls-library.shtml>.

## Personal Financial Planning (Masters)

The Department of Personal Financial Planning and the School of Law offer an integrated program in which students may obtain both a J.D. degree from the School of Law and a MS degree in Personal Financial Planning (FINPLN). The Program is registered with the Certified Financial Planner Board of Standards, Inc. and graduates may sit for the CFP® examination.

Normally, students require three years to complete the requirements for the J.D. degree and at least a year to complete the requirements for the MS degree. With careful scheduling of courses, this plan of study may be completed in as little as 3 ½ years. Dual Degree students normally spend their first year in the School of Law, and in their second begin to enroll in courses in both schools. This first year in the School of Law provides an understanding of the basics of the study of law, and the underpinnings for further study.

Students pursuing the Dual Degree Program must be admitted separately to both the School of Law and the FINPLN Program. The School of Law requires the LSAT admissions test; FINPLN requires the GRE or admission to the School of Law.

Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/ms-pfp.shtml>.

## Public Affairs (Masters)

Students completing the required course of study will be eligible to receive the JD degree from the School of Law and the MPA degree from the Harry S Truman School of Public Affairs. The course of study may be completed in four years. Normally, students require three years to complete the requirements for the JD degree and two years to complete the requirements for the MPA degree. Additional details are available from the School of Law at <http://law.missouri.edu/academics/dualdegree/mpa-public-admin.shtml>.

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## School of Medicine

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Established in 1841, the school offers an innovative problem-based curriculum that provides medical students with early exposure to clinical training. In addition to undergraduate medical education, the school offers a master's degree in health administration and boasts well-established, residency and continuing education programs. It is recognized nationally for its primary care and rural training programs. The Health Sciences Center provides health care for patients from every Missouri county.

For more information about the School of Medicine, call (573) 882-9219.  
<http://medicine.missouri.edu>



## College of Veterinary Medicine

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The college was established in 1946. It offers a four-year program leading to the doctor of veterinary medicine (DVM) degree. The college provides diagnostic and patient-care services for animals. The college has a national reputation for excellent student-to-instructor ratio and state-of-the-art facilities. Biomedical science courses available to undergraduate students are listed in this catalog. The college also offers post-graduate training to interns, residents in various specialties and graduate students.

For more information about the College of Veterinary Medicine, call (573) 882-9594. <http://cvm.missouri.edu>

# About MU

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## Welcome to Mizzou

### Our mission

Our distinct mission, as Missouri's only state-supported member of the Association of American Universities, is to provide all Missourians the benefits of a world-class education enriched by service and global interaction. We are stewards and builders of a priceless state resource, a unique physical infrastructure and scholarly environment in which our tightly interlocked missions of teaching, research, service and economic development work together on behalf of all citizens. Students work side by side with some of the world's best faculty to advance the arts and humanities, the sciences and the professions. Scholarship and teaching are driven by a sense of public service — the obligation to produce and disseminate knowledge that will improve the quality of life in the state, the nation and the world.

### We are MU — Missouri's Flagship University

We are a diverse group of students, faculty and staff who value the excitement and learning that come from interaction among people with richly different backgrounds and ideas.

We challenge talented undergraduates to stretch their minds and imaginations with the unique strengths of a major research university. Our students experience an interwoven web of learning experiences — in classrooms, in residence hall learning communities, and in collaborative research and creative, artistic and service projects with faculty.

We develop the world leaders of tomorrow through rigorous graduate and professional programs across the broadest range of disciplines offered on a Missouri campus.

We ensure improving the quality of MU through a financial model that supplements taxpayer support with rational tuition and student aid, public-private partnerships and aggressive fundraising. Our responsible fiscal planning assures both excellence and access for all well-prepared students, regardless of socioeconomic status.

We live and work in a community of scholars. We treasure our core values of respect, responsibility, discovery and excellence.

As a 21st century land-grant university, we are an economic engine for Missouri. We generate businesses and jobs by creating and disseminating the knowledge that fuels the new economy.

We use our unique intellectual resources to improve the civic, economic, health and educational well-being of Missourians from all walks of life and all corners of the state. We are committed to improving the quality of life of students and their families and communities through the creative and performing arts and the application of new knowledge.

## Important Facts

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### History

The University of Missouri was established in Columbia in 1839 as the first public university west of the Mississippi River, and the first public university in Thomas Jefferson's Louisiana Purchase territory. In 1870 the University of Missouri was approved as a land-grant university under the Morrill Act of 1862. The original mission of land-grant institutions was to make higher education accessible to more people. Gradually that mission

has expanded to include research, service and outreach; enabling the state's citizens to benefit directly from the knowledge gained through university research. As Missouri's flagship university, MU continues its historic mission through its emphasis on excellence in teaching, research, service and economic development.

### Students

- Students come from all 50 states and more than 100 countries. The diversity of backgrounds, opinions and lifestyles improves the overall quality of the student experience.
- The university has more than 27,000 undergraduate students who choose courses from a broad range of academic disciplines.
- The university also has more than 7,000 graduate and professional students enrolled in more than 90 different degree programs. The professional schools include more than 1,200 students in law, medicine and veterinary medicine.
- MU is nationally recognized for its Freshman Interest Groups, where students with shared academic interests live in the same residence hall and often attend classes together. These communities provide a strong academic and social foundation for freshmen, as well as increased faculty involvement with students.

### The Campus

- The University of Missouri prides itself on respecting the past while embracing the future. The 1,262-acre Mizzou campus is a testament to that belief. From the six Ionic Columns that adorn Francis Quadrangle to the Memorial Union Tower that honors fallen soldiers to the MU Student Center completed in 2010, every piece of campus represents equally the heart and soul of what it means to be a Tiger.
- The campus is also a living museum with hundreds of plant species from all over the world that make up the Mizzou Botanic Garden. The garden features over 42,000 plants and invites a stroll through more than 170 years of history as MU was transformed into the global university it is today. National magazines and newspapers consistently rank Columbia, among the top cities in the nation for its excellent quality of life.

### Alumni

There are more than 260,000 living alumni worldwide. Many continue to support the University through membership in the Mizzou Alumni Association.

### University of Missouri Board of Curators

Ann K. Covington, Columbia  
Pamela Quigg Henrickson, Jefferson City  
Don M. Downing, Webster Groves, Vice Chairman  
Wayne Goode, St. Louis, Board Chairman  
David Bradley, St. Joseph  
Donald L. Cupps, Cassville  
David L. Steward, St. Louis  
John R. Phillips, Kansas City  
Amy Johnson, Student Representative

### University of Missouri System Administration

Timothy M. Wolfe, President UM System  
Gary R. Allen, Vice President for Information Technology  
Betsy Rodriguez, Vice President for Human Resources

Mike Nichols, Vice President for Research and Economic Development  
Stephen C. Knorr, Vice President for University Relations  
Natalie "Nikki" Krawitz, Vice President for Finance and Administration  
Steve Graham, Senior Associate Vice President for Academic Affairs  
Stephen J. Owens, General Counsel  
Robert Schwartz, Chief of Staff

## Leadership of the University of Missouri

Brady J. Deaton, Chancellor  
Michael A. Middleton, Deputy Chancellor  
Brian L. Foster, Provost  
Robert V. Duncan, Vice Chancellor for Research  
Hal Williamson, Vice Chancellor of University of Missouri Health System  
Tom Hiles, Vice Chancellor of University Advancement  
Jackie Jones, Vice Chancellor for Administrative Services  
Cathy Scroggs, Vice Chancellor for Student Affairs  
Karen Touzeau, Associate Vice Chancellor of Human Resource Services  
Chris Koukola, Assistant to the Chancellor for University Affairs  
Rhonda Gibler, Director of Budget  
Todd McCubbin, Associate Vice Chancellor of Alumni Relations and Executive Director, Mizzou Alumni Association  
Kenneth D. Dean, Deputy Provost  
Jim Spain, Vice Provost for Undergraduate Studies  
Michael D. Quart, Vice Provost and Director of Cooperative Extension  
Ann Korschgen, Vice Provost of Enrollment Management  
Handy Williamson, Vice Provost of International Programs  
Michael F. Alden, Director of Intercollegiate Athletics  
Thomas L. Payne, Vice Chancellor and Dean, College of Agriculture, Food and Natural Resources  
Michael J. O'Brien, Dean, College of Arts and Science  
Joan Gabel, Dean, College of Business  
Daniel Clay, Dean, College of Education  
James E. Thompson, Dean, College of Engineering  
Leona Rubin, Interim Dean of the Graduate School  
Kristofer Hagglund, Dean, School of Health Professions  
Steve Jorgensen, Dean, College of Human Environmental Sciences  
R. Dean Mills, Dean, School of Journalism  
Gary Myers, Dean, School of Law  
James Cogswell, Director, University Libraries  
Robert Churchill, Dean, School of Medicine  
Judith Fitzgerald Miller, Dean, Sinclair School of Nursing  
Neil Olson, Dean, College of Veterinary Medicine  
Harry Tyrer, Chair, Faculty Council  
Becky Stafford, Chair, Staff Advisory Council  
Nicholas W. Droege, President, Missouri Students Association  
Jacob W. Wright, President, Graduate Professional Council  
Tracey Mershon, President, Mizzou Alumni Association

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## Notifications

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All statements in this catalog are announcements of present policies only, and are subject to change without notice. They are not to be regarded as offers to contract. If you have questions or note errors or omissions, please contact the Office of the University Registrar (<http://registrar.missouri.edu>). Below is additional information for items on which the University is required to make available.

## Accommodations for Students with Disabilities

The University of Missouri complies with the American with Disabilities Act and other applicable laws and regulations. If you have a disability and need accommodations, please contact Disability Services, S5 Memorial Union, Voice (573) 882-4696, TTY (573) 882-8054, or e-mail [disabilityservices@missouri.edu](mailto:disabilityservices@missouri.edu) as soon as possible so that appropriate arrangements can be made. For more information please visit the website at <http://disabilityservices.missouri.edu>. If you need this information in an alternative format (Braille, large print, or digital format), Disability Services can provide assistance.

## Accreditation

The University of Missouri is accredited by the Higher Learning Commission of the North Central Association of College and Schools. Various schools, colleges and departments are also accredited by their respective professional associations and accrediting agencies.

## Complaint Resolution

The University of Missouri desires to resolve student grievances, complaints and concerns in an efficient, fair and amicable manner. For details on procedures to file a complaint, please refer to the section on Complaint Resolution at <http://financialaid.missouri.edu/consumer-information-disclosures/index.php>.

## Equity in Athletics Disclosure Act

The University of Missouri complies with the Equity in Athletics Disclosure Act of 1994, Section 360B of Pub. L. 103-382. This act and accompanying federal regulations require that certain information with regard to intercollegiate athletics, including operation expenses, revenue, salaries and participation rates, be made available to current and prospective students and the public. This report is available from the Department of Intercollegiate Athletics at (573) 882-6501.

## Family Education Rights and Privacy Act (FERPA)

The University of Missouri policies and procedures adhere to this federal law. Students have the right to restrict the release of directory information. Directory information for MU is defined as: a student's name, address, telephone listing, e-mail address, major field of study, student level, dates of attendance, degrees and awards received, enrollment status in any past and present semester (i.e. full/part-time), and the most recent previous educational agency or institution attended by the student.

To restrict this information, students should change their privacy settings in myZou or contact the Office of the University Registrar-Registration, 125 Jesse Hall. For the full policy, go to <http://registrar.missouri.edu/policies/ferpa.php>.

Note: University of Missouri students can grant other users direct authorized online access to their student information in myZou, which may include academic information (including, but not limited to grades), account information, directory information and financial aid. See <http://registrar.missouri.edu/registration-adddrop/additional-authorized-access.php> for more information. The University does not release grades to parents unless the student specifically authorizes it in writing in the Office of the University Registrar or a parent shows proof that the student is a dependent as defined in Section 152 of the Internal Revenue Code of

1954. "Parent" means a parent of a student and includes a natural parent, a guardian, or an individual acting as a parent in the absence of a parent or guardian.

## Nondiscrimination

The University of Missouri does not discriminate on the basis of race, color, religion, sex, sexual orientation, national origin, age, disability, protected veterans. Any person having inquiries concerning the University of Missouri compliance with implementing Title VI of the Civil Rights Act of 1964, Title IV of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, or other civil rights laws should contact the Assistant Vice Chancellor, Human Resources Services, University of Missouri, 130 Heinkel Building, Columbia, MO 65211, (573) 882-4256, or the Assistant Secretary for Civil Rights, US Department of Education.

## Oak Ridge Associated Universities (ORAU) Consortium

Since 1981, students and faculty of the University of Missouri have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 96 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the *ORISE Catalog of Education and Training Programs*, which is available at <http://www.orau.gov/orise/educ.htm>, or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact:

Robert V. Duncan  
Vice Chancellor for Research  
ORAU Councilor for University of Missouri  
Monnie E. Champion  
ORAU Corporate Secretary (865-576-3306); or  
Visit the ORAU Home Page (<http://www.orau.org>)

## State of Missouri Registration for Professional Engineers

The Revised Statutes of Missouri (Section 327.221) require that "all applicants for registration as a professional engineer in the State of Missouri after Jan. 1, 1977, be a graduate of and hold a degree in engineering in a curriculum accredited by the Accreditation Board for Engineering and Technology (ABET)." All MU undergraduate engineering bachelor's-level programs are so accredited. Applicants who receive advanced degrees in MU's engineering programs but who do not have a bachelor's degree in an accredited engineering program are not eligible for registration in Missouri. Candidates for a graduate degree (MS or PhD) in engineering who want to establish eligibility for registration should consult with their academic program chair about a plan of study that also will lead to a bachelor's degree in an ABET-accredited program. Further information about professional engineering registration may also be obtained from the Missouri Board for Architects, Professional Engineers and Land Surveyors, P.O. Box 184, Jefferson City, MO 65102.

## What catalog applies to whom under what circumstances

These policies concern the application of the University of Missouri's graduation, divisional and departmental degree requirements. MU students' academic requirements for graduation are typically met as follows:

University-wide policies, including undergraduate general education requirements:

- Students must complete the graduation requirements in effect for the term that they first enroll at MU or they may choose those in effect for the term that their degree is awarded with the agreement of their academic unit.
- This policy applies to newly admitted freshmen, newly admitted graduate students, and transfer students.
- Students who have a lapse in enrollment must meet the degree requirements in effect at the time the students are readmitted to MU.

Divisional, departmental and other degree requirements:

- Students must meet the specified divisional, departmental and major requirements for the degree(s) that were in effect when they were admitted as degree seeking to the program or may choose those in effect for the term in which they will graduate, with the agreement of their division or department.
- Students who have a lapse in enrollment must meet the standards of the degree requirements in effect when they return to MU.

After consulting with an advisor, students may appeal. Requests for exceptions to the above policy may be made to the academic dean for the academic unit in which the student is enrolled. Some academic units may have unique "grandfathering" policies that apply to changes in their programs and that supersede this policy. Students should consult with an advisor in all cases.

## A Statement of Values

The University of Missouri, as the state's major land-grant university, honors the public trust placed in it and accepts the associated accountability to the people of Missouri for its stewardship of that trust.

Our duty is to acquire, create, transmit, and preserve knowledge, and to promote understanding.

We the students, faculty, and staff of MU hold the following values to be the foundation of our identity as a community. We pledge ourselves to act, in the totality of our life together, in accord with these values.

## Respect

Respect for one's self and for others is the foundation of honor and the basis of integrity. A hallmark of our community is respect — for the process by which we seek truths and for those who engage in that process. Such respect is essential for nurturing the free and open discourse, exploration, and creative expression that characterize a university. Respect results in dedication to individual as well as collective expressions of truth and honesty. Respect is demonstrated by a commitment to act ethically, to welcome difference, and to engage in open exchange about both ideas and decisions.

## Responsibility

A sense of responsibility requires careful reflection on one's moral obligations. Being responsible imposes the duty on us and our university to make decisions by acknowledging the context and considering consequences, both intended and unintended, of any course of action. Being responsible requires us to be thoughtful stewards of resources — accountable to ourselves, each other, and the public we serve.

## Discovery

Learning requires trust in the process of discovery. Discovery often fractures existing world views and requires acceptance of uncertainty and ambiguity. Therefore, the university must support all its members in this lifelong process that is both challenging and rewarding. As we seek greater understanding and wisdom, we also recognize that knowledge itself has boundaries — what we know is not all that is.

## Excellence

We aspire to an excellence that is approached through diligent effort, both individual and collective. Pursuing excellence means being satisfied with no less than the highest goals we can envision. Pursuing excellence involves being informed by regional, national, and global standards, as well as our personal expectations. We recognize and accept the sacrifices, risks, and responsibilities involved in pursuing excellence, and so we celebrate each other's successes. We commit ourselves to this process in an ethical and moral manner.

These statements are mere words until we integrate them as values in our individual lives and reflect them in our institutional policies and practices. We pledge ourselves to make them effective in the very fabric of our lives, our community, and all our relationships with others, thereby enhancing the development of individuals and the well-being of society.

## Supporting Offices

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### Admissions - Undergraduate

230 Jesse Hall  
Columbia, MO 65211  
phone: 573-882-7786 or 1-800-225-6075 (toll free in MO, IL, KS)  
fax: 573-882-7887  
email: AskMizzou@missouri.edu  
web: <http://admissions.missouri.edu>

### Admissions - Graduate

210 Jesse Hall  
Columbia, MO 65211  
phone: 573-882-6311 or 1-800-877-6312  
fax: 573-884-5454  
email: gradadmin@missouri.edu  
web: <http://gradschool.missouri.edu/admissions/index.php>

### Admissions - Law

103 Hulston Hall  
Columbia, MO 65211-4300  
phone: 573-882-6042 or 1-888-MULAW4U  
fax: 573-882-9625  
email: mulawadmissions@missouri.edu  
web: <http://law.missouri.edu/admissions/>

### Admissions - Medicine

MA215 Medical Sciences Building  
Columbia, MO 65212  
phone: 573-882-9219  
fax: 573-884-2988  
email: MizzouMed@missouri.edu  
web: <http://medicine.missouri.edu/admissions/>

### Admissions - Veterinary Medicine

W-203 Veterinary Medicine Building  
Columbia, MO 65211  
phone: 573-884-3341  
fax: 573-884-5044  
email: VetAdmissions@missouri.edu  
web: <http://vetmed.missouri.edu/prospective.htm>

### Academic Exploration & Advising Services

909 Lowry Mall  
Columbia, MO 65211  
phone: 573-884-9700  
email: umcadvising@missouri.edu  
web: <http://aeas.missouri.edu>

### Academic Retention Services

110 Student Success Center and 508 Clark Hall  
Columbia, MO 65211  
phone: 573-882-9208  
fax: 573-884-4353  
email: muarsinfo@missouri.edu  
web: <http://success.missouri.edu/ars.html>

### Campus Writing Program (CWP)

Conley House, 602 Sanford Street  
Columbia, MO 65201  
phone: 573-882-4881  
email: cwp@missouri.edu  
web: <http://cwp.missouri.edu>

## Career Services

(Career Major Exploration, Student Employment and Job Search)

Lower Level, Student Success Center on Lowry Mall  
Columbia, MO 65211  
phone: 573-882-6801 or (573) 882-JOBS  
fax: 573-882-5540  
email: [career@missouri.edu](mailto:career@missouri.edu)  
web: <http://career.missouri.edu/>

## Counseling Center

119 Parker Hall  
Columbia, MO 65211  
phone: 573-882-6601  
web: <http://counseling.missouri.edu>

## Cashiers

15 Jesse Hall  
Columbia, MO 65211  
phone: 573-882-3097  
fax: 573-882-4453  
e-mail: [4cash@missouri.edu](mailto:4cash@missouri.edu)  
web: <http://cashiers.missouri.edu/index.html>

## Disability Services

S5 Memorial Union  
Columbia, MO 65211  
phone: 573-882-4696 or (VP) 573-234-6662  
fax: 573-884-5002  
email: [disabilityservices@missouri.edu](mailto:disabilityservices@missouri.edu)  
web: <http://disabilityservices.missouri.edu>

## Division of Information Technology

615 Locust St, Rm E100  
Columbia, MO 65211  
phone: 573-882-5000  
email: [helpdesk@missouri.edu](mailto:helpdesk@missouri.edu)  
web: <http://help.missouri.edu> (for IT help)  
web: <http://doit.missouri.edu> (for additional information)

## Financial Aid

11 Jesse Hall  
Columbia, MO 65211  
phone: 573-882-7506 or 800-225-6075 (toll free in MO, KS, IL)  
fax: 573-884-5335  
email: [finaidinfo@missouri.edu](mailto:finaidinfo@missouri.edu)  
web: <http://financialaid.missouri.edu/>

## Intensive English Program and English Language Support Program

208 McReynolds Hall  
Columbia, MO 65211  
phone: 573-882-7523  
fax: 573-882-0360  
email: [iepmu@missouri.edu](mailto:iepmu@missouri.edu)  
web: <http://iep.missouri.edu>

## International Center

(International Center, Study Abroad and International Student and Scholar Services)

N52 Memorial Union  
Columbia, MO 65211  
phone: 573-882-6007  
email: [international@missouri.edu](mailto:international@missouri.edu) (International Center)  
web: <http://international.missouri.edu/> (International Center)  
email: [studyabroad@missouri.edu](mailto:studyabroad@missouri.edu) (Study Abroad)  
web: <http://international.missouri.edu/studyabroad> (Study Abroad)  
email: [iss@missouri.edu](mailto:iss@missouri.edu) (International Student and Scholar Services)  
web: <http://international.missouri.edu/iss> (International Student and Scholar Services)

## Learning Center

Student Success Center- 1st level  
phone: 573-882-2493  
e-mail: [learningcenter@missouri.edu](mailto:learningcenter@missouri.edu)  
web: <http://success.missouri.edu/tlc.html>

## Libraries

104 Ellis Library  
Columbia, MO 65201  
phone: 573-882-4701  
email: [ellisref@missouri.edu](mailto:ellisref@missouri.edu)  
web: <http://mulibraries.missouri.edu>

## Mizzou Online

136 Clark Hall  
Columbia, MO 65211  
phone: 573-882-2491 or 1-800-609-3727  
fax: 573-882-5071  
email: [MizzouOnline@missouri.edu](mailto:MizzouOnline@missouri.edu)  
web: <http://online.missouri.edu>

## Office of the University Registrar

125 Jesse Hall  
Columbia, MO 65211  
phone: 573-882-7881  
email: [umcunivregistrarwr@missouri.edu](mailto:umcunivregistrarwr@missouri.edu)  
web: <http://registrar.missouri.edu>

## Student Health Center

1020 Hitt St, 4th Floor  
Columbia, MO 65201  
phone: 573-882-7481  
fax: 573-882-5370  
email: [mizzoustudenthealth@missouri.edu](mailto:mizzoustudenthealth@missouri.edu) (non-medical questions)  
email: [immunizations@health.missouri.edu](mailto:immunizations@health.missouri.edu) (immunization questions)  
web: <http://studenthealth.missouri.edu/>

## Student Success Center

909 Lowry Mall  
Columbia, MO 65211  
phone: 573-882-6803  
fax: 573-884-9625  
email: [success@missouri.edu](mailto:success@missouri.edu)

web: <http://success.missouri.edu>

## Testing Services - Main Office

4 Parker Hall  
Columbia, MO 65211  
phone: 573-882-4801  
fax: 573-882-8439  
email: [umcvcsatesting@missouri.edu](mailto:umcvcsatesting@missouri.edu)  
web: <http://testing.missouri.edu>

## Testing Services - Computer-Based Testing

1 Parker Hall  
Columbia, MO 65211  
phone: 573-884-0911  
web: <http://testing.missouri.edu>

## Veteran's Center

N-5 Memorial Student Union  
Columbia, MO 65211  
phone: 573-884-4383  
fax: 573-884-4387  
email: [veterans@missouri.edu](mailto:veterans@missouri.edu)  
web: <http://veterans.missouri.edu/>

## Women's Center

G108 MU Student Center  
Columbia, MO 6511  
phone: 573-882-6621  
web: <http://womenscenter.missouri.edu>

## Academic Assessment Goals for Undergraduates

All undergraduate students are required to participate in the University's processes/program for assessing student learning in general education and in the major fields. The purpose of assessment at MU is to provide faculty and administrators with the information they need to ensure high levels of student learning. The key goal is to improve how and what students learn in their programs and to increase how much they learn. At the same time, the process provides documentation of student learning to help programs and the University meet external requirements, including those of accreditation organizations.

Faculty members develop assessment strategies specific to each degree program and conduct assessments at appropriate points in their students' undergraduate careers. Each program at the University has defined learning objectives for their students that form the basis of assessments. Students participate in assessments of discipline-specific learning objectives and of learning objectives aligned with the University's learning objectives for all students.

In order to meet the needs of the people of the State of Missouri, the nation and the global society, the University of Missouri shall provide its baccalaureate graduates with a sound intellectual foundation in the liberal arts and sciences and in the student's chosen major fields of study. Toward that end, in addition to having every bachelor's degree recipient fulfill appropriate course work requirements for general education and for

degree programs, MU strives to have all students achieve the following goals:

**Goal 1: Graduates of MU will be able to identify and evaluate new information in light of previous knowledge.**

MU graduates will be able to:

- Identify issues and problems important to society, define their scope, and identify information needed to address them.
- Find existing sources of information on a topic.
- Evaluate the accuracy, validity, and reliability of information presented in a wide variety of media.
- Conduct appropriately focused library, field or laboratory research.
- Analyze and synthesize information gathered, demonstrating strategic and logical reasoning skills.
- Demonstrate understanding of costs, benefits, and/or consequences of proposed resolutions of issues and problems important to society.
- Organize information, data and ideas for further analysis and/or presentation.

**Goal 2: Graduates of MU will possess the knowledge, abilities, and skills necessary to communicate effectively.**

MU graduates will be able to:

- Communicate information to a variety of audiences and purposes.
- Revise and edit their presentations to improve clarity and accuracy.
- Engage in the healthy and positive exchange of ideas.
- Apply communication skills in furthering their post-MU careers.
- Use multiple formats and technologies to communicate ideas effectively.

**Goal 3: Graduates of MU will possess the knowledge, abilities, and skills necessary to serve society responsibly.**

MU graduates will be able to:

- Understand the duties of being a responsible citizen.
- Identify and analyze the requisite behaviors for carrying out their academic and professional lives with integrity.
- Work collaboratively with others where appropriate.

**Goal 4: Graduates of MU will possess knowledge to observe and critically analyze the diverse human experience.**

MU graduates will be able to:

- Engage in life-long learning.
- Appreciate fine art and literature.
- Understand the contributions of diverse groups and experiences to life at the individual, community, national, and the world levels.
- In addition, some students will be required to take standardized tests in their major field and/or for general education.

## University General Education Assessment

Each year, a sample of seniors will participate in a University general education assessment examination known as the CAAP Exam, which addresses University general education competencies of MU students in the areas of mathematics, science reasoning, reading, writing and critical thinking.

## Major Field Assessment

Prior to graduation, all seniors will participate in assessment of their mastery of course work in their major field. The assessment program is determined by the faculty of each department to measure the extent to which students are achieving instructional goals and outcomes for graduates in that field. The methods of assessment are appropriate to the educational goals for students in their respective major fields. Information on subject field assessment is included with the college and school sections of this catalog. Methods may include:

- Nationally-normed examinations
- Portfolio review
- Performance review
- Capstone project
- Faculty-developed exit examinations
- Exit interviews University

## University Organization

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The largest academic units at the University of Missouri are its colleges and schools. Each college and school may consist of smaller units called departments. Some colleges have divisions within them as well, which are a collection of departments within a college or school. By long tradition, some of the smaller units are also called schools.

The academic year is divided into two 16 week semesters (fall and spring) and one 8 week summer semester. The January intersession is considered part of the spring semester for registration and financial aid purposes. The May intersession is considered part of the summer session.

## Academic Programs and Degree Structure

To earn a degree from the University of Missouri, students must complete all University, college and/or school, departmental and major requirements. In some cases, the major requirements may include emphasis areas and/or minors. In other cases, there may be options or tracks, which do not appear on transcripts.



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# Academic Policies

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The academic rules and regulations of the University of Missouri are published online in the *Collected Rules and Regulations of the University of Missouri* and the *MU Faculty Council Academic Regulations* (<http://faculty council.missouri.edu/handbook/intro.html>). The following are selected policies and procedures. Many are summarized as a guide for students. Students needing additional information on academic regulations in specific colleges and schools may obtain this information from their deans' offices.

If a policy is only applicable to certain students and not all students, this is indicated with one of the following codes. Else the policy is applicable to all University of Missouri students.

- (G) policy applicable to Graduate students only
- (L) policy applicable to Law students only
- (U) policy applicable to Undergraduate students only

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## Absences

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Students are expected to attend all scheduled class sessions. A student who does not complete assigned academic work because of absence from class is responsible for making up that work in accordance with instructions provided by the faculty member consistent with any policy established by the faculty of the respective department, school or college. A school or college faculty, a department faculty, a course director or an individual instructor may establish attendance standards and will determine whether a student will be permitted to make up work missed as a result of absence(s). There is no dean's excuse or official absence. (<http://financialaid.missouri.edu/eligibility/satisfactory-academic-progress.php>) See *Satisfactory Academic Progress Policy for Financial Aid Eligibility*.

However, a student, who is also a member of a national guard, Federal Emergency Management Agency or military reserve unit and is called to active duty while the University is in session, will be permitted to make up work missed as a result of such absences for up to two weeks of absences, provided that to do so does not require the instructor to

engage in individualized tutorial work with the student. Recognizing that some students have contractual obligations to the University, while others are participating in intercollegiate events at the behest of their departments, faculty are encouraged to make accommodations for absences incurred because of these responsibilities. In enforcing their absence policy, it is recommended that faculty give due consideration to the important role that extracurricular activities play in the development of students, as well as to the benefits they provide to both our university and community.

Students must notify instructors of any scheduled absences within the first two weeks of the semester. In the case of later qualifying events, the instructor must be informed two weeks prior to those events. Instructors are encouraged to advise students of their absence policy at the beginning of the semester.

## Academic Dishonesty

Academic honesty is essential to the intellectual life of the University. Thus, academic dishonesty, such as cheating and plagiarism, is a basis for disciplinary action. In all cases of academic dishonesty, the faculty member makes an academic judgment about the student's grade on that work and in that course and reports all incidents to the provost for disciplinary action.

Academic honesty is fundamental to the activities and principles of the University. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting or collaboration, consult the course instructor. Refer to the *Collected Rules and Regulations*, Section 200.010, Standard of Conduct ([http://www.umssystem.edu/ums/rules/collected\\_rules/programs/ch200/200.010\\_standard\\_of\\_conduct](http://www.umssystem.edu/ums/rules/collected_rules/programs/ch200/200.010_standard_of_conduct)), and Section 200.020, Rules of Procedures in Student Conduct Matters ([http://www.umssystem.edu/ums/rules/collected\\_rules/programs/ch200/200.020\\_rules\\_of\\_procedures\\_in\\_student\\_conduct\\_matters](http://www.umssystem.edu/ums/rules/collected_rules/programs/ch200/200.020_rules_of_procedures_in_student_conduct_matters)) for more specific details. (The *Collected Rules* are available on the University of Missouri System web site.) According to the UM Rules of Procedures in Student Conduct Matters, when they suspect that academic dishonesty has occurred, faculty members have an obligation to report an incident to the Office of the Vice Provost for investigation

## Academic Progress (G)

### Measuring Graduate Student Progress

#### Annual Requirement: Review of Graduate Student Progress

Since 2006, the Graduate School has required that all graduate students file an annual report on their academic performance, degree program milestones, and related academic/scholarly/research/creative achievements. Faculty mentors (advisers) are required to review their advisees' annual reports to assess if their advisees are making satisfactory progress toward degree completion. In some cases, the director of graduate studies and/or department chair also reviews the students' annual reports and faculty member responses.

Each division/area/department degree program must inform all students of the annual progress reporting requirement. This includes printed, published or electronic materials provided to graduate students (e.g., handbooks, orientation materials, guidelines, web site.)

### Graduate Student Progress System ([gsps.missouri.edu](http://gsps.missouri.edu))

The Graduate Student Progress System (GSPS) is a web-based reporting system where students document their progress toward degree completion. All graduate students (i.e., in all disciplines) are required to submit an annual progress report by starting/updating a GSPS record. Faculty members use the GSPS to review students' annual reports, assess their progress and provide feedback to the students.

At a minimum, students are required to report on academic progress, completion of required forms, award and honors, conferences, presentations, publications, service activities, creative activities, employment, funding activity, and job placement. Academic program faculty or administrators may require additional indicators of performance or achievement to accommodate the unique needs of their programs. Additional information on measuring graduate student progress is at [gradschool.missouri.edu/policies/progress/](http://gradschool.missouri.edu/policies/progress/).

### Probation and Termination Dismissal

In addition to dismissal for failure to meet the usual examination and grade requirements, departments and graduate degree-granting area programs have the right to place on probation and, after at least 30 days of probation, to dismiss from their program any graduate student who is deemed to be making insufficient academic progress or whose work is not of the quality required. The faculty adviser or academic program chair must inform the Graduate School as soon as the student is notified and the probationary period begins. The dismissal may occur at any time during a student's work toward a graduate degree.

For additional information on satisfactory progress, probation, termination, extension and appeals go to the Extension and Appeals of Satisfactory Progress Infractions section of this policy manual (click here to go to that section), or go to the web page version of the catalog, found at <http://gradschool.missouri.edu/policies/progress>.

### Extension and Appeals of Satisfactory Progress Infractions

The progress of each graduate student is evaluated annually by the student's adviser and/or director of graduate studies (DGS). The definition of "satisfactory progress" and procedures for its verification may vary among departments/programs. If a department/program has instituted timelines that differ from those applying generally to graduate students (see below), these timelines should be made available to students from their entrance into the graduate degree program. If a student is authorized to diverge from progress timelines established by either the department/program or the Graduate School, this fact should be documented in written form and endorsed by the student's adviser and DGS.

### Progress Toward Degree

Full-time students (those taking 9 hours or more per semester) should follow the time frames associated with degree programs discussed in the Graduate Policy Manual under Master's Degrees and Doctoral Degrees. They must submit required forms on time and maintain a grade point

average of 3.0 or better. Furthermore, they must successfully undergo their departments' annual review processes.

Part-time students should file a timeline for successful degree completion with their departments and the Graduate School. This timeline should be endorsed by the director of graduate studies and a prospective adviser by the end of the first calendar year of admission into the department/program. When these timelines conflict with time to degree guidelines laid out in the Graduate Policy Manual's sections on master's and doctoral degrees, they must receive the endorsement of the dean of the Graduate School.

## Distinction Between Requests for Extension and Appeals

A "Request for an Extension" and an "Appeal" are distinct processes for dealing with problems related to "satisfactory progress." A "Request for Extension" is the appropriate course of action when a student has failed to meet satisfactory progress provisions of the Graduate School. The "Appeal Process" should be followed when a department/program has dismissed a student after the required probationary period.

## Academic Progress (L)

### Student Progress

#### Annual Review of Students' Progress

The progress of each graduate student will be evaluated annually by the Director of the LL.M. Program.

For students who first enrolled in the LL.M. Program after January 1, 2001, the following are the standards of "satisfactory progress" in the LL.M. Program, subject to individual exceptions for good cause as approved by the Director of the LL.M. Program. Normally, students should complete all degree requirements within three (3) years of enrollment. By the end of the first year of enrollment, students must have completed at least eight (8) credits that satisfy requirements for the LL.M. degree. By the end of the second year of enrollment, students must have completed at least sixteen (16) credits that satisfy requirements for the LL.M. degree. By the end of the third year of enrollment, students must have completed at least twenty-four (24) credits that satisfy requirements for the LL.M. degree. Time spent in the armed services will not count toward the period for completing the degree requirements.

For students who first enrolled in the LL.M. Program before January 1, 2001, to achieve "satisfactory progress," students must complete an average of at least four (4) credits for every academic year since their initial enrollment in the LL.M. Program.

The Graduate School will be informed of all students who are not making satisfactory progress. When there is a question as to whether satisfactory progress is being made, the Director of the LL.M. Program will write to the student and recommend a face-to-face meeting with the student. If there is disagreement, the Director of the LL.M. Program will ask the student to submit a separate letter to him or her. Copies of both letters will be made available to the student, maintained in a departmental file, and forwarded to the Graduate School.

If difficulties persist and the Director of the LL.M. Program determines that probation is appropriate, the Director will notify the student in writing of the probationary period, which may be from 30 days to a full semester. The probation letter will state explicitly that the student is on departmental probation and state precisely what must be accomplished and by what

date in order to enable the student to return to good standing in the Program and be removed from probation. Within ten (10) working days of receipt of the probation letter, the student may submit a written request for a review of this decision by the LL.M. Admissions Committee, which may affirm or revise the probation letter or determine that probation is not appropriate.

If the student does not comply with the conditions of probation, a letter signed by Director of the LL.M. Program will be sent to the student (with a copy to the Graduate School) with notification of dismissal from the LL.M. Program. Within ten (10) working days of receipt of the probation letter, the student may submit a written request for a review of this decision by the LL.M. Admissions Committee, which may affirm or revise the notification of dismissal or determine that dismissal is not appropriate (with a copy to the Graduate School). The Graduate School sends the official notice of dismissal from the Program.

A student may appeal a dismissal decision to the Graduate Faculty Senate only after completing the Program's appeal process. The full text of the Dismissal Policy and Appeals Process for Graduate Students (<http://gradschool.missouri.edu/academics/progress/requests-for-extensions-appeals.php>) can be found in the Graduate School Catalog on its web site.

## Academic Renewal

Students who are returning to the University of Missouri to pursue an undergraduate degree after an extended absence may request permission to remove one or more complete academic terms from future degree and GPA considerations.

### Eligibility

To be eligible for academic renewal consideration, students must meet these requirements:

- Students must not have enrolled as degree-seeking at the University of Missouri for four or more consecutive years.
- Students must not have graduated from the University of Missouri-Columbia.
- Students must either:
  - be admitted as degree-seeking and have earned a minimum of 12.0 credits with at least a 2.5 GPA of record for those credits at the University of Missouri within the past 12 months; OR
  - have attended as a non-degree-seeking student and have earned thereby a minimum of 12.0 credits with at least a 2.5 GPA of record for those credits at the University of Missouri within the past 12 months and subsequently have been admitted as degree-seeking by the University.

### Conditions

Academic renewal is based on the following conditions:

- All courses and credits taken during the chosen terms will be removed from consideration for GPA and degree requirements. Students may not combine individual courses from multiple terms to comprise the semester(s) dropped. All courses and grades for the chosen terms will remain on the student's academic record.
- Renewal may be applied only to academic terms completed prior to the student's extended absence.
- Students may be granted only one academic renewal.

- Students who choose academic renewal must meet the degree requirements of the University of Missouri undergraduate catalog at the time of their readmission.
- Degree requirements met during the dropped terms must be repeated.
- To be eligible for a degree, students must complete a minimum of 24 credits at the University of Missouri after the granting of academic renewal.

## Procedures

- Students should discuss their desire to pursue academic renewal with an academic advisor in the college they wish to enter.
- Students should submit an application for academic renewal (<http://registrar.missouri.edu/forms/academic-renewal-petition.pdf>) to the Office of the University Registrar.
- For each term approved for academic renewal, a note will appear on the transcript.

Questions may be directed to the Office of the University Registrar, 125 Jesse Hall, (573) 882-7881.

## Academic Standing

Academic performance is represented by academic standing, according to the *Faculty Handbook* (<http://facultycouncil.missouri.edu/handbook>), of which there are three levels: regular, academic probation, and ineligible to enroll. For the purposes of this policy, “term” may refer to a semester or summer term.

### Regular Academic Standing

Students whose term and cumulative GPAs are 2.0 or higher are in regular academic standing.

### Probation

Students in regular standing whose term GPA subsequently falls below 2.0, but is 1.0 or above are placed on probation. Students on probation must establish a 2.0 cumulative GPA within two successive terms of enrollment; otherwise they are ineligible to enroll.

Any beginning student admitted to the University of Missouri who does not meet the minimum entrance standards as specified in the *Faculty Handbook*, Article II, Admissions, Advanced Standing, and Classification will enter on scholastic probation and will have one semester in which to remove probation.

### Ineligible to enroll

Students whose term GPA falls below 1.0 are ineligible to re-enroll. Students on probation must establish a 2.0 cumulative GPA within two successive terms of enrollment; otherwise they are ineligible to enroll.

In the application of the foregoing rules, the dean or faculty committee of the division concerned will determine how an incomplete grade in a course will be considered in determining a student’s academic standing. A student who has been ineligible to enroll for a period of one year may be readmitted only upon the approval of the dean of the school or college in which the student desires to enroll. If a readmitted student again becomes ineligible to enroll, his or her ineligibility is normally considered permanent. These regulations are the prescribed minimal standards but do not limit the authority of the faculty of any school or college to adopt and enforce additional regulations affecting students enrolled therein.

## Advanced Standing - Credit by Exam

MU offers the opportunity for advanced credit by examination to any student with fewer than 90 credits. Credit may be awarded, but no grades or honors points are recorded. General eligibility to receive advanced standing at MU does not guarantee its applicability to a degree program. A student who has received credit for any portion of a lower level course will not receive advanced standing credit for that same course. More information can be found at <http://admissions.missouri.edu/apply/ap-ib-and-college-credits/index.php>. The programs described below are used to award credit.

### Advanced Placement Program

The Advanced Placement Program of the College Board is accepted by MU. The examinations are prepared and graded by national committees, and the results are furnished to MU on request of the student. Students who receive a sufficiently high score are eligible for college credit. Students should contact their academic units if they have questions.

### College Level Examination Program

The College Level Examination Program of the College Board provides general examinations and subject examinations. Credit may be awarded for CLEP subject exams only. Credit must be applicable in students’ programs of study. (Refer to the appropriate section in this catalog for the school or college, or contact the academic unit to ascertain the specific limitations for CLEP examinations.)

### Credit by Examination for Mathematics Courses

It is possible to receive credit in the following math courses by passing the appropriate examination:

MATH 1100	College Algebra	3
MATH 1140	Trigonometry	2
MATH 1160	Precalculus Mathematics	5
MATH 1360	Geometric Concepts	3
MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
Total Credits		23

To inquire about these examinations, contact either the Group Testing Program, 220 Parker Hall, (573) 882-4801, or the departmental representative on testing for advanced placement. Credit for a course by examination is not available to students who have essentially covered the material of the course in college or university courses.

### Departmental Examinations

Departmental examinations are limited to students with fewer than 90 credits and with no official record of previous enrollment in the course(s) in which credit is to be received.

Departmental examinations are comparable to final examinations given in the various courses offered on campus. The examinations are objective or essay formats and are prepared and graded by the faculty of the department concerned and MU Testing Services. Arrangements for departmental examinations should be made through Testing Services.

(Also see the College of Arts and Science information on departmental exams (p. 126).)

## International Baccalaureate

MU recognizes the International Baccalaureate Program. Students may receive credit and/or advanced standing for proficiency on the higher-level subject examinations. No credit is granted for subsidiary-level examinations.

## Additional College Course Work

MU recognizes college course work completed before high school graduation if the college attended provides an official transcript of the course work.

## Freshman Placement Tests

Placement in English is based on ACT score in English. Math placement is based on ALEKS Exam score or prior course credit. (See [mathplacement.missouri.edu](http://mathplacement.missouri.edu) for more details)

## Subject Examinations

Subject examinations are limited to students with fewer than 90 credits. The subject examinations are generally accepted by most schools and colleges but may not be considered for credit in all degree programs.

## Application for Degree

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Students should contact their academic unit *at least* a full semester before they anticipate graduating to complete the appropriate steps and paperwork to apply for receiving their degree. The University does *not* automatically anticipate or calculate who will be degree candidates each term.

## Attendance (L)

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### Policies & Rules — Attendance

Law Schools approved by the American Bar Association must require regular and punctual class attendance. The rules below implement this requirement at MU, and were adopted by the faculty on November 19, 1992:

- A. Class Attendance
  - A. Attendance is expected, in accordance with the ABA policy statement.
  - B. Administration of the attendance policy lies with the individual instructor for each course.
  - C. The individual instructor determines the number and nature of absences from each course for an excess of which sanctions may be imposed, as well as the sanctions which will be imposed, up to and including dismissal from the course.
  - D. If the instructor intends to attach a formal sanction (grade reduction or dismissal from the course) to inadequate attendance, he/she must announce to the class in writing at the beginning of the course what the rules governing attendance in that course will be, with appropriate provision for notice to late enrollers.

- E. A student who is in danger of accumulating excessive absences must be given notice by the instructor in advance of the absence which will give rise to a significant sanction (major grade reduction or dismissal from the class).

#### B. Appeals

- A student who is dropped from a course for excessive absences may meet with the Dean and request reversal of the decision. Such a student may seek the assistance of the Grievance Committee of the Student Bar Association in support of the request. A final decision on the appeal rests in the discretion of the Dean.

## Required Attendance at Class

Attendance is required except when there is good cause for a student's absence. The instructors for each course administer the attendance policy for their courses. The instructors determine the number and nature of absences from each course that may cause sanctions to be imposed, as well as the sanctions which will be imposed, up to and including dismissal from the course. If instructors intend to attach a formal sanction (grade reduction or dismissal from the course) to inadequate attendance, they must announce to the class in writing at the beginning of the course what the rules governing attendance in that course will be, with appropriate provision for notice to late enrollers. Students who are in danger of accumulating excessive absences must be given notice by the instructor in advance of the absence that will give rise to a significant sanction (major grade reduction or dismissal from the course).

## Auditing a Course (Hearer)

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Students who wish to obtain knowledge from a course, but do not need or want the credit for graduation, may enroll in the course(s) as auditors/hearers.

- Hearers receive no credit toward a degree and an H grade appears on the transcript.
- Students pay standard fees for the course(s).
- Students' academic advising unit must approve and change their grading option in myZou for the change to become official. Students may not change their registration status (hearer vs. credit) after the expiration of two weeks following the first day of classes in regular session or the equivalent thereof in a shorter session. See the University Registrar's website at <http://registrar.missouri.edu/dates-deadlines.php> for deadlines for each semester.
- Students who fail to meet class requirements may be dropped from the course by their academic advising unit upon request of their instructor and with the dean's stamp.
- Normally, a hearer will attend the course on a regular basis; either the department or an individual instructor will stipulate the requirements for enrollment in a course as a hearer.

## Class Cancellation Guidelines

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Refer to the the MU Faculty Council on University Policy regarding class cancellation guidelines (<http://facultycouncil.missouri.edu/handbook/class-cancellation.html>).

## Completion of a Course

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A course is considered complete if the student earns a grade of A, B, C, D, F or U, and the "+" or "-" sign if appropriate, or S for the course.

A course in which the student receives a grade of W, NR, or I is not considered a completed course.

- The faculty of the division concerned will determine how the grade of I in a course and a grade in a repeated course will be considered in determining a student's academic standing. However, for financial aid purposes the grade of I is not considered a completed course and a repeated course will be counted as additional credits attempted.
- The dean of the relevant division may, after consulting with relevant faculty, waive any of the regulations governing a student's eligibility to re-enroll. However, the Financial Aid Advisory Committee shall have authority concerning students' satisfactory progress toward their educational objectives and eligibility to receive federal, state and institutional student financial aid.

## Computer Policies (L)

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### Acceptable Use Policy

- Priority use of lab computing equipment is for academic rather than recreational purposes. If you are asked to relinquish use for this reason, your compliance is expected and appreciated.
- Computing at MU is a community enterprise serving academic, administrative and research needs. Please conserve resources by carefully managing your e-mail, data, web files, and printing.
- Users will respect copyright, slander, libel, anti-discrimination and other appropriate laws as well as the security and proper functioning of the campus network.
- MU is committed to privacy and will not routinely inspect the contents of your computer files.
- MU provides uncensored access to materials on the campus network or the Internet unless those materials violate federal or state laws.

For more detailed information on current acceptable use guidelines, or to report a potential violation, view MU's Acceptable Use Policy ([http://www.umssystem.edu/ums/rules/collected\\_rules/facilities/ch110/110.005\\_acceptable\\_use\\_policy](http://www.umssystem.edu/ums/rules/collected_rules/facilities/ch110/110.005_acceptable_use_policy)).

### Law School Computer Lab Polices

- **Limited Access to the Law School Computer Lab** - In order to use the computer lab you must be a current MU law student. Access to the computer lab is a privilege and is not transferable to non-law students. You may not let your family use the lab for any purpose.
- **Computer Availability and Priority of Use** - Computers in back of the lab are available during regular library service hours on a first-come, first-served basis. Computer training classes held in the front room of the lab take priority over individual use. An ADA workstation is available in Room 119 of the lab. Students who require access to this equipment in order to be able to access library resources have priority. All decisions as to the use of the computers are at the discretion of the Library Director, the Associate Director, or the Automation Librarian.
- **Copyright and Licensing Restrictions** - The user is responsible for observing all copyright laws. The software and documentation made available in the lab is for use only in the lab and is not to be duplicated for use elsewhere. Duplicating a copyrighted program or

documentation is illegal and is an Honor Code violation. Any use of computer-assisted legal research databases (Westlaw and Lexis) is for academic purposes only. Terms of use are governed by individual subscriber agreements for each system.

- **Assumption of the Risk** - The MU Law Library and MU School of Law make no guarantee with respect to any equipment, programs, or other materials in the computer lab. The entire risk as to the quality and performance of the computer equipment, programs, and documentation is with the user. The lab is not responsible for loss of data due to faulty programs or equipment.
- **Data Storage** - Users may not store their files on the hard drives of the individual workstations or on the law school's network. Users may not save their personal settings on individual workstations.
- **Reporting Equipment Problems** - Report any PC or printer problem, such as paper jams, toner replacement, backed-up print jobs, etc. to the User Support Analyst, student lab assistant, or reference office. Do not attempt to fix any lab equipment on your own. Lab supplies (paper reams, toner etc.) are to be handled by staff only.
- **Food, Drink and Tobacco are not allowed in the lab.**
- **Lab Phones and Help Desk** - Lab phones are for staff use only. Public telephones are available in the student area of the subplaza.

Failure to observe lab policies and directions from library staff regarding proper lab use may result in restriction or revocation of computer access, or in termination, academic probation, or prosecution under federal or state law.

## Course Repeat Policy

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The course repeat policy will not be applied automatically to a student's GPA. After completing the second attempt of a course, a student must submit a request for GPA adjustment form to the University Registrar's Office 125 Jesse Hall.

When the grade received in an initial attempt, for an undergraduate course at University of Missouri-Columbia, or any University of Missouri System Campus, is a "C-", "D+", "D", "D-", "F" or "WF", the grade will be replaced in the calculation of the GPA by the grade received in any second attempt of the same course at the University of Missouri-Columbia (unless the repeat grade is an I or W). All grades received in second and subsequent attempts will be included in GPA calculations. No more than 15 semester hours will be dropped from the calculation of the student's GPA. All attempts of a given course will appear on the official transcript with the grade(s) earned. The transcript will have an explanation that the GPA is calculated using all grades earned in a course except the initial attempt when a course has been repeated. This policy is effective with course work where the initial enrollment and completion of the course was fall semester 2000 and thereafter.

Any course being repeated may not be taken on an S/U basis. This policy does not imply a guarantee that openings will be available in courses if and when students wish to retake them, and instructors will not ordinarily know whether a student is enrolled in a course for the second time. When a course is repeated, all applicable tuition and required fees apply.

Degree credit may be earned only once for a particular course unless a department or division has, in other policies, allowed for multiple credit from that course.

Students are strongly encouraged to visit with an advisor to determine whether re-enrollment is advisable (certain department or divisional policies may be important in this connection). Further, students should

be aware that repeating a course may have an impact on financial aid, insurance, entrance to professional schools, participation in athletics, immigration status, and other non-academic matters.

The academic status of a student in a given semester will not change as a result of repeating a course.

The policy is applicable to undergraduate students only.

## Clarifying comments

Students should not re-enroll in a course for which they have been assigned a grade of "I".

Students may not apply the course repeat policy to courses once they have graduated. This also applies to students who are seeking a second undergraduate degree.

For the purposes of this policy, an undergraduate course is any course an undergraduate student attempts for undergraduate credit regardless of the course level. A student may not apply the course repeat policy to a course repeated as an undergraduate student for graduate credit.

If the department or course number has changed since the student completed the first attempt of a course, the department offering the course will verify that the subsequent course is substantially the same and the course repeat policy may apply. If the initial course is a cross-listed course, a student may apply the course repeat policy if the student subsequently completes the cross-listed course offered by the alternate department.

Courses for which a NR, W or a grade of I are assigned are not considered attempts since no final grade has been recorded.

If the initial attempt of a course contained an attribute such as; honors, writing intensive, math reasoning proficiency, service learning, or computer proficiency, the second attempt is not required to contain the same course attribute for the purpose of the course repeat policy. Students should be aware that if the second course does not have the same attribute as the initial course they will no longer be allowed to count the initial attribute toward any graduation requirement.

Grades of C or greater may not be repeated under the course repeat policy because these grades are considered acceptable work and would not prevent a student from graduating from MU.

Students may replace the grade earned from the course at the University of Missouri-Columbia or any other University of Missouri campus with a grade earned in an equivalent course at University of Missouri-Columbia campus. Courses for which a W or a grade of I are assigned are not considered attempts since no final grade has been recorded.

## Course-Load Rules (L)

The maximum number of hours permitted for a semester is seventeen (17), and seven (7) for a summer session. The minimum number of hours permitted for a semester in order to be considered a full-time student is twelve (12). There is no minimum for the summer session.

## Credit for Non-Law Courses (L)

Law students are permitted to take up to a total of three (3) hours of courses for Law School credit in other schools of the University during law school. Please note that because you are listed at "primary degree program-Law" with the University, you will be charged the per credit hour rate for ANY non-law courses (NOT the undergraduate or graduate per

credit hour rate). This does not apply to students officially enrolled in a dual degree program.

1. These credits are taken on an S/U basis and are subject to the following regulations:
  - A. The course must be at the graduate level (numbered 7000-9999).
  - B. The course must be related to the student's study and future practice of law.
  - C. The semester hours of the non-law course will be counted in the student's total number for the semester, and the student may not (without permission) take any more than a combined total of 16 hours in a regular semester, or 7 in a Summer Session.
  - D. Students wishing to take a non-law course for law credit MUST request approval of the course in writing prior to enrolling in the course. The request should be given to the Associate Dean and include the following (using a form available in Room 203):
    - i Course name, number and instructor;
    - ii Statement of purpose for taking the course as related to (b) above.
  - E. e. Requests for the approval of below 7000-Level non-law courses within the guidelines given above must be referred to the Standards Committee. The Associate Dean may approve 7000-9999 level courses.
  - F. Any petition for law school credit for non-law courses beyond a cumulative maximum total of three (3) hours, other than the Accounting for Managers 7310, must have approval in advance by the Faculty.

## Degrees, Diplomas and Certificates

The process for awarding Degrees, Diplomas and Certificates at the University of Missouri is governed by the Faculty Council. For a full listing of this process please see *Article IX of the Faculty Handbook* (<http://facultycouncil.missouri.edu/handbook/article-9.html>).

## Disability Accommodations (L)

It is the policy and practice of the University of Missouri School of Law to comply with the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and state and local requirements regarding students and applicants with disabilities. No individual shall be discriminated against by the University of Missouri School of Law because of a disability, nor shall any qualified individual with a disability be denied access to or participation in Law School services, programs, or activities because of the disability. The School of Law is committed to providing reasonable accommodations for individuals with disabilities, though the School is not required to make accommodations that are unduly burdensome or that fundamentally alter the nature of the program.

Students who have been accepted for admission are advised in their acceptance letter to contact the Associate Dean as soon as possible regarding disabilities that might require accommodation. Continuing students who believe they have acquired or developed a disability should also contact the Associate Dean as soon as possible. Early identification of disabilities is necessary to allow adequate time to

evaluate documentation and to coordinate accommodations required. The accommodation process takes some time, so the Law School may be unable to grant last-minute requests for accommodation.

## Accommodation Process

To accommodate students with disabilities, the School of Law and the Office of Disability Services have arranged the following accommodation process:

1. A student who believes he/she has a disability that requires any accommodation should notify the Associate Dean.
2. The Associate Dean will then refer that student to the Office of Disability Services, located in Room A038 of Brady Commons.
3. The Director of the Office of Disability Services will meet with the student, request medical records and other information from the student, and make a recommendation to the Associate Dean about what, if any, accommodations seem appropriate. Please note that the Office of Disability Services must first receive all necessary medical documentation from the student.
4. The Associate Dean and the Director of Disability Services will then decide what accommodations to provide, if any, in light of the student's medical information and the student's course schedule, exams, and/or graded exercises.
5. In the event the Director of Disability Services and the Associate Dean disagree about what accommodations are appropriate, the Associate Dean's determination will govern.
6. The Associate Dean will then provide the student with a letter identifying the accommodations the Law School will provide. At that time, the Associate Dean will ask the student to indicate his/her acceptance of the accommodations in writing.
7. The Law School and the Office of Disability Services will work in conjunction to coordinate the accommodations. Any problems that arise should be brought to the attention of the Associate Dean and/or the Office of Disability Services.

## Academic Dismissal and Readmission

If a student who is academically dismissed raises a previously undisclosed disability as a basis for academic difficulty, the burden will be on the student to explain why the disability was not previously brought to the attention of the administration, to explain why accommodations were not requested or why those provided were not adequate, and to demonstrate that the disability was the cause of the dismissal.

Readmission requests should be directed to the Associate Dean. The Associate Dean will forward the request to the Law School's Standards & Readmissions Committee which acts on the requests. For further information on the readmission process, please see the Student Handbook.

## Bar Examination

Law students with disabilities who believe they will require accommodations in taking the bar examination should inquire early in their legal education as to what will be necessary to obtain accommodations. Information on how to contact bar examiners in all states is available from the Office of Career Services. Many state boards of bar examiners will request that the law school provide information on accommodations provided during law school upon a written release from the student.

## Career Services

The Office of Career Services provides assistance to all students and does not discriminate on the basis of disability. Students who believe that an employer working through Career Services has discriminated on the basis of disability should bring their concerns to the attention of the Director of Career Services.

## Grievances

If a student who requests accommodations from the School of Law believes that he/she has been discriminated against on the basis of his/her disability, the student should bring this matter to the attention of the Associate Dean. The Associate Dean and the Office of Disability Services will attempt to resolve the matter and will communicate their decision to the student. If the student is dissatisfied with the decision, the student may file a grievance with the ADA Coordinator. Grievances filed with the ADA Coordinator must be in writing and must be filed within two weeks of the date the Associate Dean communicated the decision to the student.

## Confidentiality

Information related to a student's disability is treated as confidential information under applicable federal, state, and university laws.

## Dismissal

A dean may at any time, and following such procedures as are reasonable, dismiss a student from a class or from a school or college for failure to perform academic duties.

In addition, the director of the Student Health Center (<http://studenthealth.missouri.edu>) has the authority to exclude a student from classes and other University exercises and activities because of exposure to a communicable or contagious disease, or to require a student to withdraw from the University at any time if the student has a medical condition constituting a hazard to themselves, other students or the campus community.

*Adapted from the Faculty Handbook.* (<http://facultycouncil.missouri.edu/handbook/article-3.html>)

## Dismissal and Probation (L)

### A. Rules for Dismissal and Probation

1. For purposes of this section (Policies & Rules – Dismissal and Probation)
  - a. "First year" consists of that series of semesters or summer sessions, or both, at the end of which a student first receives grades in courses aggregating to not less than 24 hours.
  - b. "Semester" means either the fall or spring semester. The summer session is considered to be part of the next succeeding semester for the purpose of computing semester grade point averages.
2. A student is dismissed:
  - a. at the end of the student's
    1. first semester if the student's cumulative grade point average is equal to or less than 76.399 ; or
    2. second semester if the student's grade point average for that semester is equal to or less than 76.399



3. first year if the student's cumulative grade point average is equal to or less than 76.399; or
  - b. at the end of any semester after the student's first year if the student's grade point average for that semester is equal to or less than 76.399 ; or
  - c. at the end of any semester during which the student has been on probation if the student's grade point average for that semester is equal to or less than 77.499; or
  - d. at the end of any semester during which the student has been on probation if the student's grade point average for that semester is
    1. not sufficient to raise his or her cumulative grade point average to an average greater than 77.499 if continued in future semesters until the remaining requirements for graduation have been satisfied; or
    2. is less than the semester or cumulative grade point average which was imposed upon the student as a condition of probation or readmission;
  - e. at the end of any semester prior to the completion of the student's first year if
    1. the student has received grades in at least two sessions and
    2. has received grades in at least 12 hours of coursework; and
    3. has a cumulative grade point average of equal to or less than 76.399 ;
  - f. at the end of that semester where the student has a cumulative grade point average equal to or less than 77.499 after completing 89 or more hours of course work.
3. A student is placed or continued on probation:
    - a. at the end of the student's first year if the student's cumulative grade point average is greater than 76.399 but equal to or less than 77.399 ; or
    - b. at the end of any semester after the student's first year, if the student's grade point average for that semester is greater than 76.399 but equal to or less than 77.399 ; or
    - c. a student who is on probation will be continued on probation if the student's cumulative grade point average is equal to or less than 77.499 , but the semester grade point average is sufficient to raise his or her cumulative grade point average to a cumulative grade point average greater than 77.499 if continued in future semesters until the remaining requirements for graduation have been satisfied.
  4. Any first year student who does not achieve a grade point average greater than 77.499 in the fall semester will be required to take the course in Legal Reasoning during the second semester. Students who are required to take the course in Legal Reasoning under this provision will drop one of their courses. The course to be dropped will be decided in consultation with the Associate Dean for Academic Affairs.
  5. A student ceases to be on probation at the end of a semester when the student's cumulative grade point average and grade point average for that semester are both greater than 77.499

6. After the first semester of the first year, a student is in "good standing" at the School of Law if the student's cumulative GPA is greater than 76.399. Thereafter, a student is in good standing when both the student's current semester and overall GPA are greater than 77.499.

## **B. Rights of Students Petitioning for Readmission**

Students who petition the Law School for readmission following academic dismissal have the following rights:

1. Fair notice of the time and place of the meeting.
2. To submit any supporting written material to the Faculty Readmissions Committee and/or to the Faculty at large in advance of the meeting, or to present such material at the meeting.
3. To appear personally at the meeting and make a presentation of reasonable duration.
4. To be accompanied by a person of their own choosing.
5. To be informed promptly following the meeting of the Committee's recommendation or decision, or the Faculty's decision.

## **C. Readmission Procedures**

1. Readmission Procedures for students dismissed at the end of the first semester under Rule 2.a.1
  - a. A student dismissed at the end of the student's first semester whose grade point average for the first semester is equal to or less than 75.299 will not be permitted to attend law school for the succeeding spring semester. Such student will be permitted to enroll for the next fall semester provided the student gives notice of his or her intention to enroll by April 15 of the semester following the student's dismissal. A student so re-enrolling will retake all the first year courses, and will be required to obtain a grade point average greater than 77.499 for the repeated semester. If the student fails to obtain this grade point average, the student will be dismissed. At its discretion, the Faculty Readmissions Committee may require readmitted students or students on probation to drop one or more of their courses.
  - b. A student dismissed at the end of the student's first semester whose grade point average is greater than 75.299 and equal to or less than 76.399 may apply for readmission for the spring semester. Such student may not attend classes unless he or she has filed a written petition for readmission within the time limits indicated in the letter of dismissal issued by the School of Law. To qualify for readmission, an applicant for readmission must show that the applicant's poor academic performance was the result of facts other than intellectual inability to perform satisfactory law school work and that these factors will not continue to impair the applicant's performance in the future. If the Faculty Readmissions Committee denies readmission for the spring semester, or if the student requests readmission as of the next fall semester, the student shall be readmitted for the following fall semester subject to the same conditions described in paragraph C.1.a above, or under such conditions as the Readmissions Committee may determine. If the student is readmitted for the spring semester, the student will be subject to the dismissal rules under paragraph A.2.a.2 and A.2.a.3 above, but shall not be subject to dismissal under paragraph A.2.c or A.2.d above.

## 2. Readmission Procedures for students dismissed at any time after the first semester

- a. A student who has been dismissed may not attend classes unless the student has filed a written petition within the time limits indicated in the letter of dismissal issued by the School of Law.
- b. To qualify for readmission, an applicant for readmission must show: (1) that the applicant's poor academic performance was the result of facts other than intellectual inability to perform satisfactory law school work; (2) that these factors will not continue to impair the applicant's performance in the future; and (3) that there is reasonable probability that the applicant's grade point average can be raised to the graduation level by the time 89 credits have been accumulated.
- c. A petition for readmission by a student who has been dismissed shall be heard by the Faculty Readmissions Committee. A quorum of the Faculty Readmissions Committee, for purposes of deciding petitions for readmission, shall consist of one less than all voting members. If the Committee's decision is favorable for readmission, or is unanimous against readmission, that decision shall be final and the student shall have no right of appeal to the faculty at large. If the Committee's decision is unfavorable against readmission, but not unanimous, the petition shall be referred to the faculty at large for decision.
- d. A student who petitions for readmission has the right to appear personally before the Faculty Readmissions Committee and, if allowed under these rules, the Faculty at large. The student may be summoned to appear before either group by making a personal appearance or by supplying answers to written questions. (See above for a full statement of rights of petitioners.)
- e. A student who has been dismissed for scholastic reasons and whose readmission is approved will be on probation and subject to such conditions as may be imposed. The conditions below will apply unless varied by the Faculty or Faculty Readmissions Committee.
- f. It is the policy of the Faculty Readmissions Committee to make decisions on readmission prior to the end of the summer term for those students who are dismissed at the end of the spring semester and who may be enrolled in the summer term. Therefore, the readmission decision will not be delayed until summer grades are received.

## D. Standard Conditions for Law Students Readmitted after Scholastic Dismissal, and for Law Students on Probation

Students who are readmitted or are on probation are subject to the following conditions as well as any specific conditions stated in the readmission action:

- a. they will continue on academic probation until achieving academic good standing, which requires a cumulative grade point average greater than 77.499.
- b. students placed on probation at the end of the Fall semester of their first year, will be required to take the course in Legal Reasoning (5090) (<http://www.law.missouri.edu/academics/curriculum.html#5090>) during the second semester. At its discretion, the Faculty Readmissions Committee may require such students to drop one or more of their courses.
- c. until such time as they achieve a cumulative grade point average greater than 77.499, they must maintain a semester grade point average as set out in the readmission action. If no semester grade point average was specified, the student must maintain a semester grade point average sufficient to raise the student's grade point average to a cumulative grade point average greater than 77.499 by the time the other requirements for graduation are completed.
- d. their schedule of courses must be approved by the Associate Dean for Academic Affairs, and the dropping of any course during the semester must also be approved by the Associate Dean for Academic Affairs. In general, students will be required to take required courses before electives and take graded courses rather than pass-fail courses.
- e. during any session in which they are enrolled, they will not engage in any employment for compensation or spend a substantial amount of time on extra-curricular activities without the prior written approval of the Associate Dean for Academic Affairs. "Substantial amount of time on extra-curricular activities" is interpreted by the Standards and Readmissions committee to include participation in any internal or external competition sponsored by the Board of Advocates as well as any position of leadership on any student board or organization.
- f. Unless exempted by the Faculty Readmissions Committee, they are not allowed to take the following courses:
  - \* Externship
  - \* Independent Research
  - \* Courses taught outside Law School for Law School credit (e.g. graduate courses)
  - \* Courses taught by adjuncts
  - \* Seminars, except students classified as third-year students
  - \* Participate in any Study-Abroad Programs
  - \* Clinics or Clinic related courses including (Criminal Clinic, Clinical Skills, Family Violence Clinic, Innocence Project Legislative Practicum, Landlord/Tenant Practicum)

## Drug and Alcohol Policy

### Drug Free Schools & Community Act

Pursuant to the Drug-Free Schools and Communities Act Amendments of 1989, the University of Missouri is required to establish a drug and alcohol prevention program for its students and employees. Following is a description of the University of Missouri-Columbia's program. A biennial review of this program will be done to determine its effectiveness, to implement changes to the program if they are needed and to ensure that the University's disciplinary sanctions are consistently enforced.

A reference listing of MU resources for alcohol and other drug educational preventions efforts, counseling, and referral are listed below. Please feel free to contact any of the offices listed for more information.

### Standards of conduct

University of Missouri-Columbia regulations prohibit the unlawful possession, use, distribution, and sale of alcohol and illicit drugs by University students and their guests and for employees on University-

owned or controlled property and at University-sponsored or supervised activities.

## University Discipline

Violation of these University regulations can result in disciplinary action up to and including expulsion for students and discharge for employees.

## Legal sanctions

Local, state and federal laws also prohibit the unlawful possession, use, distribution, and sale of alcohol and illicit drugs. Criminal penalties for violation of such laws range from fines up to \$20,000 to imprisonment for terms up to and including life.

## Health risks

Specific serious health risks are associated with the use of alcohol and illicit drugs. Some of the major risks are listed below. For more information contact the Wellness Resource Center in G202 MU student Center or at [www.wellness.missouri.edu](http://www.wellness.missouri.edu).

### Alcohol and Other Depressants (barbiturates, sedatives, and tranquilizers)

Addiction; accidents as a result of impaired ability and judgment; overdose when used with other depressants; damage to a developing fetus; heart and liver damage.

### Marijuana

Impair short-term memory, thinking, and physical coordinations. Can cause panic reaction and increase the risk of lung cancer and emphysema. Can interfere with judgment, attention span concentration, and overall intellectual performance. Impairs driving ability. May cause psychological dependence and compromise the immune system.

### Cocaine

Addiction, cardiovascular system damage including heart attack, brain damage, seizures, lung damage, severe depression, paranoia, psychosis. Similar risks are associated with other stimulants, such as speed and uppers.

### Nicotine

Tobacco smoke contains thousands of chemical compounds, many of which are known to cause cancer. Nicotine, which is a central nervous system stimulant, produces and increase in heart and respiration rates, blood pressure, adrenaline production and metabolism. People can rapidly become physically and psychologically dependent on tobacco. Compromises the immune system.

### Inhalants

Inhalants are a diverse group of chemicals that easily evaporate and can cause intoxication when their vapors are inhaled. Most inhalants are central nervous system depressants. Use of these drugs slows down many body functions. High doses can cause severe breathing failure and sudden death. Chronic abuse of some of these chemicals can lead to irreversible liver damage and other health problems.

## Resources

A variety of resources exist for alcohol and other drug prevention education, counseling and referral. For detailed information concerning these resources available from the University and community agencies, students may contact the Wellness resource Center (<http://wellness.missouri.edu>), G202 MU Student Center, 882-4634 and/

or the Counseling Center (<http://counseling.missouri.edu/student-services>), 220 Parker Hall, 882-6601 and employees may contact the Employee Assistance Program (<http://counseling.missouri.edu/employee-assistance-program>), 205 Parker Hall, 882-6701. Such referrals will respect individual confidentiality.

## Wellness Resource Center -- Campus Alcohol and Drug Abuse Office

Alcohol and other drug abuse prevention programs, speakers, peer educators, and referral services and research. Provides leadership in the planning and coordination of Alcohol Responsibility Month, Wellness Month, Safe Springs Break and etc. Provides educational brochures and other printed materials and houses a large resource library of books, brochures, videos and other materials on a variety of wellness issues including alcohol and other drugs of wellness. Provides BASICS (Brief Alcohol Screening Intervention for College Students) workshops and individual assessments for students caught in violation of alcohol or drug policies or individual sessions for students who would like their alcohol or drug use evaluated.

**Counseling Center** (<http://counseling.missouri.edu>)  
Individual counseling, group counseling and alcohol or drug evaluations.

**Student Health Center** (<http://studenthealth.missouri.edu>)  
Offers medical services and individual consultation, presentations to campus groups, printed materials, peer educators on sexual health related issues and stop smoking, individual and group consultation.

**University Police crime prevention unit** (<http://www.mupolice.com/cp>)  
Provides presentations on the legal aspects of alcohol and other drugs as well as other related issues. 5 General Services Bldg.

**Total Person Program** (<http://www.mutigers.com/sports/acad/miss-acad-body.html>)  
Services for intercollegiate athletes include counseling, drug and alcohol abuse education and other wellness related issues.

## GAMMA (Greeks Advocating the Mature Management of Alcohol)

Greek student organization that provides alcohol awareness programs for fraternity and sorority members.

## Dual Enrollment

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### Dual Enrollment for Senior Undergraduates

Beginning Fall 2012, qualified undergraduate students will be eligible to enroll in up to 12 hours of graduate credit during the last 30 hours of their undergraduate program. The eligibility requirements are listed below.

### Eligibility Requirement

With the approval of the undergraduate advisor, the undergraduate divisional dean, the Director of Graduate Studies, and the Graduate Dean, eligible seniors may dually enroll as an undergraduate for up to 12 semester hours of graduate credit. To qualify, seniors must:

1. Rank in the upper half of their class.
2. Have a B average in the most recent 45 semester hours of credit.
3. Be within 30 hours of completing graduation requirements for the first bachelor's degree.

**Note:** Graduate degree programs may establish their own policies with regard to enrollment in and the applicability of senior dual enrollment credits.

Dual enrollment forms (<http://gradschool.missouri.edu/forms-downloads/repository/dual-enrollment.pdf>) (PDF) must be completed and approved by the Graduate School prior to registering for the graduate level courses.

This program also is available to seniors in other Missouri colleges. Additional information may be obtained from the Graduate School.

## Undergraduate/Law Enrollment (90-Credit Program)

With prior written approval, select undergraduate MU Arts and Science students may have up to 30 credits in courses from the School of Law, which are acceptable to the faculty of the College of Arts and Science, applied toward a Bachelor of Arts degree. This combined curriculum enables students to obtain both the Bachelor of Arts (BA) and the Juris Doctor (JD) degrees in six years.

Other university divisions, and some colleges and universities other than MU, accept the Juris Doctorate in lieu of the fourth year of college and award a baccalaureate degree upon graduation from MU's Law School. Students interested in this program should check with the dean of their college early in their undergraduate careers to ensure compliance with all requirements.

The undergraduate degree is a requirement for the Juris Doctor degree. Students entering law school under this combined degree program must make arrangements with their undergraduate schools to complete all requirements for their undergraduate degree.

Students with Bright Flight or MU awarded scholarships, such as Curators, Excellence, and Diversity, may use these awards in the law school. Check with the Office of Financial Aid.

*Please note: While not a problem in the state of Missouri, prior to participating in the 90-credit program, students should determine whether participation would adversely affect admission to the bar in the jurisdiction in which they expect to practice. Some states will not admit to their bar persons with fewer than 14 semesters of university work or who did not have their bachelor's degree before entering law school.*

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## Enrollment Requirements (G)

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### Enrollment Requirements for Master's and Educational Specialist Degree Candidates

After completing courses, students expecting to take examinations, present a thesis, manuscript, project, or portfolio must be enrolled when that activity occurs. If a master's and educational specialist candidate only needs to take exams or defend a thesis or project, the candidate can enroll for "Graduate Examination" hours in myZou. Registration in the "Graduate Examination" does not count toward enrollment certification. Students enrolled in the "Graduate Examination" would not be considered full-time or part-time. If students need to use the library or computers on campus, they should enroll in at least one hour of regular credit hour instead of "Graduate Examination".

## Enrollment Requirements for Doctoral Candidates

Candidacy for a doctoral degree is established by passing the comprehensive examination. Status as a continuous enrollment doctoral student begins the term after the term in which the comprehensive exam was successfully completed.

### Important Note on Continuous Enrollment Status and Financial Aid

Students with financial aid should check with the Student Financial Aid office before registering for the Graduate Examination option. Failure to do so could cause serious consequences for the student's financial aid status.

### Important Note for International Students on Continuous Enrollment and Your Visa Status

International students must check with the International Center before registering for the Graduate Examination option. Failure to do so could cause serious consequences for the student's visa status.

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## Examinations (U)

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### Evening examinations

If a conflict arises between a group evening examination and a regularly scheduled class, the regularly scheduled class has priority. The instructor giving the group evening examination is responsible for scheduling a makeup examination at a mutually convenient time for both the student and the instructor.

### Classes, Exams and Finals

For the schedule of evening exams and finals week schedule, refer to the Class, Exams and Finals (<http://registrar.missouri.edu/classes-exams>) on the University Registrar's website.

### Credits by Examination

<http://admissions.missouri.edu/apply/ap-ib-and-college-credits/credit-by-examination.php>

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## Examinations (L)

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### Exams on Computer

The following policy applies to student use of computers in taking examinations that (1) are administered during business hours within the law school building and (2) restrict student access to some reference materials during the writing of the examination. It therefore does not apply to "take-home" examinations (since it is impossible for the Law school to provide staff support for the examination software in that environment), nor to examinations taken within the building with no restrictions on the use of reference material (since the examination software is not needed in that situation). With respect to examinations that do not fall within the present policy, individual faculty members may establish their own reasonable policies for use of computers. Any such policy should be announced to students and support staff early in the term.

## Laptop Computer Requirements

In order to participate in exams on computers, you must meet the following requirements:

### System and Hardware Requirements

The following requirements are specifically for laptops used to take exams:

1. 10 MB free hard disk space
2. 800 x 600 screen resolution (minimum)
3. All laptop computers must have a supported internal or PCMCIA Wireless Network card configured for the university's wireless network including current WEP key. The network card must be in current working order and configured correctly.
4. All laptop computers must have an available and functioning USB port. The USB port will be used **ONLY** in the event that an exam cannot be sent electronically. The law school will provide a USB flash drive in the event that an exam cannot be sent electronically.
5. All laptop computers must have a fully charged battery. A second fully charged battery is also recommended. **NO AC POWER ADAPTERS WILL BE ALLOWED TO ANY STUDENT DURING THE EXAM. While "external" batteries may be permitted, the power source which recharges the laptop's internal battery or supplies external power shall be originally designed to operate a laptop computer substantially similar to the laptop it is proposed to now support. For example... automotive, marine, motorcycle batteries, or UPS units for power outages and the like ARE NOT acceptable power sources. Exam proctors and MU IT staff are ultimately responsible for accepting or rejecting any "external" battery use during an exam and may reject any such use for perceived safety concerns.**

Recommended system requirements for individual laptop computers may be viewed at the following URL: <http://law.missouri.edu/library/technology/recommendations.html>.

#### Currently Supported Operating Systems

Windows Vista (32 & 64 bit)  
Windows 7 (32 & 64 bit)  
Windows 8 (32 & 64 bit)  
Mac OS X 10.5 (Leopard)  
Mac OS X 10.6 (Snow Leopard)  
Mac OS X 10.7 (Lion)  
Mac OS X 10.8 (Mountain Lion)

#### NOT supported...

Any Windows version prior to Windows Vista  
Mac OS X 10.4 and prior operating systems  
Any flavors of Linux or Unix  
Any pirated versions of any operating system

#### NOT allowed...

Bootcamp  
Parallels  
PC or Mac emulators

*View the most recent list of Exam4 supported and non-supported operated systems.*

## Software Requirements

Students are required to have the **most current version** of the Exam4 software downloaded and installed successfully on their laptops prior to

taking the exam. Students arriving on the day of an exam without the current software downloaded and installed will not be able to use their laptops for the exam and must complete the exam using a blue-book.

- Each exam cycle there is an updated version of the Exam4 software created for the MU School of Law. Thus, even if you have previously taken exams with Exam4, you will need to download the updated version of the software for the current semester. Thus, if you took a mid-term examination, you will need to download another version of Exam4 for finals for that semester. Similarly, if you downloaded Exam4 for Fall exams, you need to download a new version for mid-terms or finals for the Winter semester or Summer School.
- Notifications and specific instructions will be emailed to your university email account when the new version of Exam4 is available for each exam cycle.

## Laptop Computer Use Policy

1. Use of computers to write an examination must be authorized by the individual faculty member teaching each course. Depending on the number of students in a course, exams on computer may not be offered. A faculty member may authorize computer use for all, part, or none of an examination. Faculty members should announce to students, early in the term, whether computer use will be permitted on the examination(s) in each course.  
To offer exams on computer, it must be feasible for the law school to do so. As a result, there must be sufficient student interest in exams on computer to allow such use. Accordingly, the following guidelines may be used:
  - a. In classes with less than 15 students, all students must opt in for an exam to be offered on computer.
  - b. Where the class size is 15 or more, but less than 25, no determination can be made until AFTER students make their selection about exams on computer. When those numbers are known, the law school will then determine if there are enough students wishing to take the exam on computer to make it feasible to so offer the exam.
  - c. For classes with 25 students or more, at least 25% of the students must elect to take the exam on computer for it to be feasible to be so offered.
  - d. These guidelines are just that: guidelines, and will be viewed as such.
2. No student will be required to use a computer for an examination. Whether an examination is offered on computer is subject to paragraph 1.
3. All students who use computers to write their examinations will be required to use the software approved by the Law school (Exam4) and follow the procedures established by the law school. Individual faculty members may impose supplemental procedures for examinations in their courses that are not inconsistent with those established by the School of Law.
4. AC power outlets **WILL NOT** be provided to any student taking an exam on computer and **MAY NOT BE USED** during the taking of an exam on computer. Students who use computers will be expected to furnish their own computers with a fully charged battery. An additional laptop battery (also fully charged) is highly recommended. **NO AC POWER ADAPTERS WILL BE ALLOWED TO ANY STUDENT DURING THE EXAM.** While "external" batteries may be permitted, the power source which recharges the laptop's internal battery or supplies external power shall be originally

designed to operate a laptop computer substantially similar to the laptop it is proposed to now support. For example... automotive, marine, motorcycle batteries, or UPS units for power outages and the like **ARE NOT** acceptable power sources. Exam proctors and MU IT staff are ultimately responsible for accepting or rejecting any "external" battery use during an exam and may reject any such use for perceived safety concerns.

5. The Law school computer lab will not be available for examination use.
6. Proctors will be available during all periods that the examination software is in use by students. However, those providing assistance will not attempt to resolve technical computer problems, and will simply witness and log any restarting of a computer by a student. Students should understand that a technical failure is possible and in that event should be prepared to complete their examinations using blue-books.
7. The implementation of this policy may involve use of software that will run only on English language-enabled Windows-based PCs and Macs with OS 10.4 or later operating systems only. **While the UMC Law Help Desk does NOT CURRENTLY SUPPORT Apple or Macintosh computers, it will provide assistance with download, installation and troubleshooting of the Exam4 software on Macs with OS 10.4 or later. Mac users MUST use the Exam4 client developed for Macs. Apple or Mac users may NOT use Bootcamp, Parallels or any other Windows emulator for the Windows version of the Exam4 client.**
8. Students will be required to download the examination software and **MUST** submit a practice exam before the examination begins in order to familiarize themselves with the software. Students will bear the risk that their computers are incompatible with the examination software.
9. Students will also bear the risk of a power failure or computer failure during the examination, and should therefore appear at the examination with a fully-charged laptop battery (again, a fully charged backup battery is highly recommended).
10. In the event I am a **Non-Law student** (a student not pursuing a J.D. degree at this time), I will pay a computing fee of **\$10** for a **one-semester license** to take law exams on computer. I understand that I am subject to all School of Law exams on computer policies.

## Pre-Exam Procedures

The individual instructors determine which classes will be available for exams on computers. Notice of those classes using computers will be published on this site.

- Carefully again review the Requirements and Policies contained on this page.
- Download the appropriate and current version of the exam software. A new version of the exam software will be available a few weeks before each exam period. At that time you will be notified via email, and directions will be posted in the **News** section of this page. You must download a new version of the software for each exam cycle. For example, the Exam4 software you download for mid-term exams CANNOT be used for finals in the same semester. Likewise, downloading for Fall finals will not suffice for Winter exams. Availability of the software for download will be announced on this site.
- Take and submit a practice exam (required). **You MUST use your Pawprint as your Exam ID in order to receive email confirmation that your exam was successfully submitted.** If you do not receive

such a confirmation within 48 hours of submitting your exam, please contact the UMC Law Help Desk at 884-7800, or . PLEASE NOTE: The confirmation will be different from the Pop-Up screen that comes up immediately after you submit your exam. That Pop-Up screen will ONLY indicate that the exam has left your computer. It will NOT indicate your exam has been received. It is ONLY when you receive confirmation from the UMC Law Help Desk that we are sure you are communicating with us. **YOU MUST submit a practice exam EACH SEMESTER and for Midterm exams. The practice exam MUST be submitted after students are advised that the current version of Exam 4 is available. Again, you MUST use your Pawprint as your Exam ID in order to receive email confirmation that your exam was successfully submitted.**

- Attend a training session for taking exams on computer (optional). Times and dates for training sessions will be posted in the **News** section of this page.
- Submit a Notice of Intent to Take Exams on Computer by the published deadline. Failure to submit the notice by the deadline will result in inability to take exams on computers. There are absolutely no exceptions to this requirement. **YOU MUST submit a separate Notice of Intent EACH SEMESTER. The Notice of Intent MUST be submitted after students are advised that the current version of Exam 4 is available.**
- Monitor this site for announcements and deadlines.

## Exam Day Procedures

Bring your laptop, fully charged battery (and backup battery) and wireless network card (if not internal) to the appropriate exam room. If you normally use an external keyboard and/or mouse, be sure to bring those as well. Arrive at least 15 minutes prior to the beginning of the exam. In the exam room, you will be provided with a blue-book for the exam, exam questions, pencils, and scrap paper. The proctor in your exam room will guide you through the following procedures -- you should practice them on your own prior to exam day:

1. Turn on your laptop, and start the Exam4 software
2. From the Exam4 software menu pick: **Prepare to start a new exam**
3. Pick the **Next** button
4. Enter your Exam ID from your blue-book twice in the fields shown
5. From the pull down menu select the exam that you will be taking.
6. From the pull down menu select the exam that you will be taking (again). The 2 selections must match or you will receive an error.
7. Pick the **Next** button
8. If you would like to set the optional timer and alerts do so. **NOTE: The proctor will keep official exam time**
9. Pick the **Next** button
10. Read the Notice of Instructions. Check to see that your computer's date and time are correct. If not, correct them per the instructions. Additionally, read the information for disabling your computer's hibernation and sleep settings and make the corrections necessary.
11. When you have read the Notice of Instruction, check the box labeled **Got it?**
12. Pick the **Next** button
13. On the Exam Mode screen type in CLOSED and then place a check in the confirmation box.
14. Pick the **Next** button

15. Review the next screen to make sure that your Exam ID and Course are correct. **WAIT** until the instructor/proctor gives you permission to begin the exam. If an exam is started before the instructor/proctor advises, an honor code violation will be issued.
16. When the instructor/proctor says to begin pick the **Begin Exam** button
17. The Exam4 software will perform a security scan for approximately 30-60 seconds on your computer, and will then display a basic word processor screen where you will type your answers.
18. Type your answer to question 1. When you have completed question one, insert an answer separation at the end. Go to **TOOLS** pull down menu, and select **Insert Answer Separation**.
19. Start typing the answer to question 2 and insert an answer separator, and so on.

### Note the Following:

- In a computer exam room, after the proctor starts the pre-exam start-up procedure, a student who enters the exam room to take an exam on computer **MAY NOT** then take the exam on computer, because that person will delay the exam for other students arriving on time. The late arriving student **MUST**, however, remain in the computer room and will be allowed to write the exam.
- Time spent resolving computer failures will not be added to the time allowed to a student to complete an examination. However, individual faculty members will retain their traditional discretion in grading, including the making of such adjustments as they deem appropriate when grading examinations in which there has been a technical failure.
- Reasonable attempts will be made to separate those taking exams on computers from those who are writing their exams. It may not be possible to provide different rooms for both groups. During Make-up or conflicted exams, students taking exams on computers may be commingled with those who are writing exams.
- Earplugs are permitted in any exam room.
- Any attempt to disable or tamper with the security features of the examination software will be prosecuted as a violation of the honor code.
- Students who take examinations on computer will have the same length of time to take the examination as those who hand write their examination.

### In Case of Problems

If your computer freezes during the examination contact the proctor immediately. **DO NOT** reboot your computer or attempt to close or re-launch the Exam4 software. When the proctor arrives you can restart the computer and reenter the exam in the amount of time it normally takes to reboot Windows. Upon reboot, the proctor will guide you through this procedure:

1. In the Exam4 dialog box choose **Select previous exam**
2. Highlight the exam you were working on
3. Pick **Begin Exam**
4. Enter the following start code: **EXAM4MULCH**
5. Type a brief reason for why the exam had to be restarted (i.e. computer froze up, battery died, etc.) The proctor will note the reboot procedure and attach a log sheet to your final exam

6. The Exam4 software will perform the security scan again, and will recover your exam up to the last automatic save. Pick **OK** to continue the exam

7. Continue with the exam until time is called.

If you are unable to get back into an exam after a lockup, battery failure, or other event, the portion of the exam that was completed prior to the freeze will almost certainly be recoverable for grading purposes. You will need to complete the rest of the exam by hand. Students should understand that an unrecoverable technical failure is possible and in that event should be prepared to complete their examinations using blue-books. Exams will not be delayed or suspended due to computer problems. The proctor will not attempt to resolve technical computer problems, but will simply witness and log any restarting of a computer by a student. When the rest of the exam is completed you **MUST** take your computer to the IT staff of the law school for recovery of the typed portion of your exam. **DO NOT** attempt to recover the data yourself.

**ANY ATTEMPT TO DISABLE OR TAMPER WITH EXAM4'S SECURITY FEATURES WILL BE CONSIDERED A VIOLATION OF THE STUDENT HONOR CODE.**

**COMMENCEMENT OR CONTINUATION OF AN EXAM WILL NOT BE DELAYED DUE TO A HARDWARE PROBLEM WITH YOUR LAPTOP.**

### Completing the Exam

When the proctor calls time you must stop typing immediately. Failure to comply will result in an honor code violation. To complete the exam process, the proctor will guide you through this procedure.

1. From the pull down menu select **End Exam Now**
2. Check the **Confirm** button
3. Pick **OK**, end exam
4. Select **Submit Electronically**. The law school **WILL NOT** accept submissions by floppy, USB flash drive, or cdrom unless your computer fails to send the exam electronically. (*See ITEM 4 under the Laptop Computer Requirement's Additional Requirements section of this page*).
5. After you pick the submit electronically button you will receive a message indicating that your exam was successfully sent to the server, pick **OK**.
6. A dialog box will appear with some information regarding your exam (i.e. number of sections and words per sections, etc.). Review the information then pick **OK**.
7. **Close** the status dialog box
8. From the **File and Save Options** pull down menu select **Exit**
9. Read the Exit Exam dialog box to make sure that your exam has been successfully sent and that you are sure you want to exit the Exam4. Check the **I'm Sure** dialog box, then pick **Exit Exam**.
10. Wait for any additional information from your instructor

### Post-Exam Procedure

There could still be a problem retrieving your exam from the receiving station. Do not uninstall Exam4, or attempt to tinker with any encrypted files on your computer, until after you receive your exam grades.

## Full-time/Part-time Status

Undergraduate students who register for fewer than 12 hours and graduate students who register for fewer than nine hours during the fall or spring semesters will be considered as enrolled part time. Undergraduate

students may not enroll in a program part time without the express permission of the academic advising unit of the school or college in which the student is, or plans to be, enrolled.

- A full-time undergraduate student is enrolled in at least 12 semester hours during the fall and spring semesters, or an equivalent number of hours during the summer session.
- A three-quarters-time undergraduate student is enrolled in at least nine semester hours during the fall and spring semesters, or an equivalent number of hours during the summer session.
- A half-time undergraduate student is enrolled in at least six semester hours during the fall and spring semesters, or an equivalent number of hours during the summer session.

Full-time enrollment for graduate and professional students:

- Graduate student — nine hours
- Law student — 12 hours
- Medical student — 14 hours
- Veterinary medicine student — 12 hours

## Grades

### GPA of Record

The grade point average for any period is obtained by dividing the quality points earned by the total number of credits for which the student was enrolled during that period. Grades of *S*, *U*, *H*, *W*, *NR*, or *I* are not included in determining the grade point average.

The undergraduate CUM GPA is the University of Missouri GPA, which will include all grades, credits, and honor points attempted at any University of Missouri campus, including all grades and credits. In computing the undergraduate GPA the grade points assigned to students' transfer work are the grade points that would have been assigned if the courses had been taken on the University of Missouri System campus, including any adjustments made under policies related to course repeats and/or Academic Renewal/Forgiveness.

### GPA Calculator Web Site

To calculate a grade point average, go to the GPA Calculator Web Site at <http://registrar.missouri.edu/grades-transcripts-records/gpa-calculator.php>

### Plus-Minus Grading System

The purpose of the grading system is to provide a framework in which the faculty can report evaluation of student performance and achievement. For undergraduates, all teachers are expected to use the grading scale approved by the faculty. This precludes any department or unit from opting to use a modification of the scale.

The A through F grading system is appropriate for those subjects and situations that allow discrimination in quality of achievement and performance. The S/U grading system is more appropriate for students wishing to take elective courses in a subject matter field in which they will be competing with majors, for mastery learning situations, and for courses graded primarily on the basis of attendance.

Grades carrying credit are: *A+/-*, *B+/-*, *C+/-*, *D+/-*, and *S*. Grades calculated in the grade point average are *A+* (4.00), *A* (4.00), *A-* (3.7), *B+* (3.3), *B* (3.00), *B-* (2.7), *C+* (2.3), *C* (2.00), *C-* (1.7), *D+* (1.3), *D* (1.00), *D-* (0.7), and *F* (0). The grades of *S*, *U*, *NR*, and *W* are not incorporated in the grade point average.

Students must have a cumulative GPA of 2.00 to remain in good academic standing.

All regulations currently applicable on a course-by-course basis and currently tied to a specific letter grade would be interpreted to mean a specific letter grade range. Hence, if a student must achieve a *C* in one course in order to proceed to another course, under the plus-minus grading system, that student must achieve a grade in the "C range," which would include the grade of *C-*.

All regulations currently tied to a specific grade average are interpreted to mean the numerical average currently associated with that specific grade. Hence, the required "C average or better" on all courses is a "2.00 average or better."

The grade of *S* (on S/U basis) is defined as equivalent to the letter grade of *C-* or higher.

### Satisfactory/Unsatisfactory Grading System

Students may elect to take courses under the S/U (pass/fail) grading system in several MU colleges and schools. Before electing to take a course on a pass/fail basis, the student should evaluate the advantages and disadvantages of the S/U grading system. The S/U grading status is indicated in the appropriate column on the registration or add/drop form. Students may change to or from the S/U status only through the tenth day of classes in a semester.

In general, the teacher of a course does not know which students, if any, are enrolled on the S/U system, and a grade of *A-/+*, *B-/+*, *C-/+*, *D-/+* or *F* for each student is reported to the Office of the University Registrar. The Office of the University Registrar staff members ascertain which students are enrolled on the S/U system and assign a grade of *U* to those reported for grades of *D-/+* or *F*, and a grade of *S* for those reported *A-/+*, *B-/+* or *C-/+*. Grades of *S* and *U* are not included in the computing of grade point averages.

Enrollment in courses under the S/U system is subject to the following restrictions by the University faculty:

- Students cannot change from one grading system to the other after the tenth day of classes in the fall or spring semesters, or the equivalent thereof in a shorter session.
- Students cannot elect to enroll in more than one course on an S/U basis in a given semester. This excludes courses taught only with the S/U grading system.
- First-semester freshmen and students on scholastic probation are not eligible to enroll in courses on an S/U system. This excludes courses taught only with the S/U grading system.
- *A+/-*, *B+/-*, and *C+/-* grades are recorded on the transcript as an *S*. *S* grades are not included in the semester or cumulative grade point average on the transcript. Full credit is earned for courses completed with a grade of *S*.
- *D+/-* and *F* grades are recorded on the transcript as a *U*. *U* grades are not included in the semester or cumulative grade point average on the transcript and no academic credit is awarded for courses completed with a grade of *U*.
- Courses completed with a grade of *S* may be accepted in an area of concentration only with the prior approval of the area advisor.

Courses completed with a grade of *S* may constitute no more than 20 percent of the total credits for the baccalaureate degree.



- Taking S/U courses may affect eligibility for Latin or other graduation honors for undergraduate students. Contact the academic advising unit for information.
- Some specified courses may not be taken on S/U basis to meet graduation or degree program requirements. Contact the academic advising unit for S/U approval.

## Selecting Grading Options (S/U vs. A through F)

Students must choose to change their grading option no later than after the expiration of two weeks following the first day of classes in regular session or the equivalent thereof in a shorter session. Students' academic advising unit must approve and change their grading option in myZou for the change to become official. See the University Registrar's website at <http://registrar.missouri.edu/dates-deadlines.php> for deadlines for each term.

## How Dropping/Withdrawing from a Class Affects the GPA

Students may drop a course through the end of the business day of the fifth week or the 25th class day of the semester. It will have no effect on the grade point average. After the 25th class day, the signature of the course instructor and/or dean of the academic unit is required. After the last day to drop, students are withdrawing from a course if they choose to leave the course. Students may withdraw from a course through the end of the business day of the 10th week or 50th class day of the semester. At this point a grade of W for withdraw is recorded if the student was passing at the time of withdrawal. If the student was failing at the time of withdrawal, the course grade is F. The instructor determines which grade to assign. A W grade does not affect the grade point average, while a grade of F does. The grade generally will not appear until all grades for the course are submitted at the end of the semester.

## Grades for Students Who Officially Withdraw from the University

No grade will be assigned to a student who officially drops prior to the 26th day of the fall or spring semester or an equivalent period in a summer session (other non-standard classes are also adjusted accordingly).

Students who officially withdraw from a standard 16-week course on or after the 26th day may be required to obtain the signature of the course instructor on the Course Withdrawal Form, available from the academic advising unit. This will inform the student of the grade (*W* or *F*) that will be submitted to the Office of the University Registrar at the end of the semester. A grade of *F* is assigned if the student is judged to be failing at the time of the withdrawal and will be calculated into the grade point average. Once the course withdrawal form is completed, students should return the form to their academic advising unit to obtain the dean's signature (stamp of approval) on an add/drop form. The add/drop form is submitted to 125 Jesse Hall for processing.

Dropping or withdrawing from all classes for a term is considered withdrawing from the University. If done after the first day of standard classes the student remains eligible to pre-register for the following term. If a term elapses (other than summer) between enrollments, the student must apply for readmission. **NOTE:** Refund dates are different from withdrawal dates. (See Withdrawal from the University section on

the University Registrar's website: <http://registrar.missouri.edu/policies/withdrawal-university.php>.)

## Grade Appeal

Guidelines for grade changes are as follows:

- Students who believe that they have been graded unfairly or incorrectly should see the course instructor.
- If still dissatisfied, the student may appeal to the chair of the department. (If the course has a large number of sections, it may have a course director. If so, the student should see the director before appealing the grade to the department chair.)
- The chair of the department will conduct an investigation. The chair cannot substitute his or her judgment for that of the instructor concerning the quality of the student's work.
- If the instructor of the course also is the department chair, the dean of the school or college will handle grade appeals.
- No one may substitute personal judgment for that of the instructor concerning the quality of the student's work. However, mathematical or mechanical errors in scoring examinations may be corrected.
- No grade shall be otherwise changed unless there is clear, convincing and unequivocal evidence that it was a direct result of arbitrary and capricious conduct by the instructor.

## Incomplete Grades (Grade of I)

Whenever students cannot be assigned a grade at the end of a course in which they have been enrolled because their work is for good reason incomplete, the instructor will postpone the grades, reporting *I* grades to the University Registrar.

An *I* grade may be assigned only when:

1. The completed portion of the student's work in the course is of passing quality AND
2. There is such evidence of hardship as to make it unjust to hold the student to the limits previously fixed for the completion of the work.

Each department of the schools and colleges maintains a record of *I* grades in courses of that department. (Exemptions are made for research courses and problems courses related to research assignments.) This record, kept in the electronic student information system, will include:

- The name of the student
- The course number, title and credits
- Semester and year of enrollment
- A brief statement of the reason for delaying the grade
- An adequate guide for the removal of the *I* grade along with a suggested final grade in the event of the departure or extended absence of the instructor from the campus

An undergraduate student who receives an *I* grade must complete the course requirements either:

1. within one year from the date it was recorded (unless the course is numbered 4950-4959 or 4995), OR
2. before the date of graduation (whichever comes first).

When an incomplete is satisfactorily resolved, the faculty member responsible for the grade change will notify the University Registrar of the revised grade.

Otherwise, the University Registrar will remove the *I* and record a grade of *F* in classes graded A-F or a grade of *U* in classes graded S/U. Any

student planning to graduate with an unresolved *I* grade should be aware that translation to an *F* could drop the GPA below the requirements for graduation. As with any academic deficiency, the low GPA would delay the student's graduation until all requirements for graduation are met.

**Note:**

- A grade of *I* is not figured into the grade point average.
- Students should not re-enroll in a course for which they have been assigned a grade of *I*.
- For further information, see the Faculty Handbook, Academic Regulations (<http://facultycouncil.missouri.edu/handbook/intro.html>).
- Exceptions to unresolved incomplete grades changing to an *F* are as follows:
  - Courses taken for graduate level credit
    - Courses taken prior to Fall 2003
    - Undergraduate research, honors research or problems courses that are approved for multiple terms of continuous research
  - Grades of *I* and the reason for the delay of grade may also be entered directly into myZou.

Questions may be directed to the Office of the University Registrar, (573) 882-4249.

## Unassigned or Erroneous Grades

To correct a grade erroneously reported, proper notification is sent from instructors and their department chairs to the Office of the University Registrar on a form provided for that purpose.

**Note:** Grade corrections must be processed within one year of the original reporting date.

In situations when there is a failure to record a grade on the official grade sheet, the University Registrar will record a *NR* (not reported) and send a written notification of this action to the faculty member and relevant department chair. The faculty member is responsible for submitting a corrected entry. After 12 months *NR* will change to an *F*.

No student may be re-examined for the purpose of changing a grade after a final grade has been reported to the University Registrar. For further information see the Faculty Handbook, Academic Regulations (<http://facultycouncil.missouri.edu/handbook/intro.html>). Questions may be directed to the Office of the University Registrar, (573) 882-4249.

## Grades & Credits (G)

### Grading Scale

Graduate students' grades in all courses counting toward an advanced degree may be reported as: A +/-, B +/-, and C +/- . Faculty members are not required to use a plus/minus grading scale; that decision should be based on the faculty member's evaluation of student performance and/or policies of their academic program.

Grade point averages are calculated as: A+ (4.0), A (4.0), A- (3.7), B+ (3.3), B (3.0), B- (2.7), C+ (2.3), C (2.0), and C- (1.7).

The Graduate School considers grades of C+, C and C- as passing grades; however, grades in the C range may not be acceptable for specific program-matic requirements and may result in the student being unable to maintain a 3.0 cumulative average. No D grade may be awarded graduate student, and a grade of F means the work has not

satisfied the minimum requirements of the course. W denotes withdrawn passing and does not affect a student's grade point average.

### S/U Grading

Graduate students may be graded satisfactory/unsatisfactory (S/U) in graduate-level courses only when those courses are designated as "graded on S/U basis only" in the online Schedule of Courses available through myZou.

### Incompletes

An incomplete grade (I) may be recorded when the student's work is incomplete but otherwise worthy of credit, or when the instructor is unable to assign a grade at the end of the semester. The student must finish this work (Problems and Research courses exempted) within the next calendar year of residence.

If the work is not completed after one calendar year, the request to change an "I" grade will require an accompanying letter of justification from the instructor. Although grades of "I" do not automatically convert to an "F" if not completed, academic programs or the instructor may establish conditions or regulations pertaining to "I" grades that are more stringent.

### Unreported Grades: NR

When grades are not reported by the instructor, these "Blank Grades" will be recorded as "NR" (Not Recorded). The NR designation will remain on the student's transcript until a letter grade is submitted. If a letter grade is not submitted, the NR can remain on the student's record indefinitely and will not revert to an "F".

### Grade Changes by Faculty

Faculty members may change grades within the policies set by the faculty. Grade Change Forms, available from the faculty member's academic unit, must be completed, signed and submitted to the Office of the University Registrar - Records Dept., 126 Jesse Hall.

### Graduate-Level Credit

No graduate credit is given for courses numbered below 7000. Graduate students taking 7000-level courses that are cross-leveled with 4000-level courses will be given additional course requirements in order to warrant graduate credit received for those courses. Courses at 8000/9000 level are primarily for graduate credit. 8090/9090 research (8990/9990 Research for Engineering students) is reserved for master's and doctoral degree students working on a thesis or dissertation.

### Grade Point Average

A graduate student's grade point average is based on the student's entire graduate record at MU. To remain in good standing, a graduate student must maintain a cumulative GPA of 3.0 or better.

### GPA and Probation

At the end of each semester, graduate students with a cumulative GPA below 3.0 are placed on probation. If at the end of the following semester the cumulative GPA is 3.0 or better, the probationary status is removed. A student on probation failing to raise the cumulative GPA to 3.0 may, on the recommendation of the department or area program, be allowed a second probationary semester.

A student is subject to dismissal upon failure to raise the cumulative GPA to 3.0 by the end of the second probationary semester, or at any time a

semester/term or cumulative GPA falls below 2.0. Note: Summer session is not counted as a semester.

## GPA and Graduation

To graduate, a student must have an overall GPA of 3.0 in all graduate courses taken at MU and not just those courses listed on a plan of study.

For more information on grading, credit and related policies go to <http://gradschool.missouri.edu/policies/progress/grading/>.

## Grades & Ranks (L)

### Class Rankings

At the end of each semester, students are included in the first year, second year or third year class lists and are given a class rank based on their position in their class list. Classes are ranked by expected date of graduation.

When calculating the class rankings for the first year and second year classes, summer grades are included in the rankings for the following Fall semester.

The graduating class ranking is determined as of the end of the summer semester and includes all students graduating within the academic year (preceding fall and spring semesters and current summer session).

### Rules for Determining Class Levels

In order to register for courses students are assigned a class level. Those class levels are determined as follows:

1. **First Year Students:** A first year student is one who has received less than 24 hours of law school grades;
2. **Second Year Students:** A student who has between 25 and 56 (inclusive) of law school grades;
3. **Third Year Students:** A third year student is one who has received more than 56 hours of law school grades;
4. **Law School Grades:** As used herein, "law school grades" means grades counting towards credit at the School of Law. Failing grades do not count as "law school grades;"
5. **Effect of Summer School.** The determination of class level is made ONLY at the conclusion of the fall and spring semesters. A student's class level will NOT, therefore change at the end of summer school;
6. **Exceptional Circumstances:** In cases of students in unusual situations, including, for example part-time or unusually heavy or light-load semesters, a determination will be made on the basis of dividing the student's law school career into relatively equal periods for the first, second and third years.

### Computation of Grade Point Average (GPA)

Grade point averages are based only on law school courses taken at this school and only upon "graded courses." For the purpose of computing grade point averages a "graded course" is one which is graded on the 65-100 scale.

A grade point average is obtained as follows:

1. The "grade points" for a graded course are obtained by multiplying the numerical grade for the course by the credit hours for the course.

2. The "grade point average" is obtained by dividing the total grade points for all graded courses by the total number of hours for all graded courses.

In computing grade point averages, all graded courses are included. When a course is repeated, the grade and hours for both takings are included in computing cumulative grade point averages subject to the following exception:

A student who is required to repeat a course will have his or her cumulative grade point average computed as follows: If the grade on the repeated course is 81 or higher, neither the hours nor the grade for the previous taking of the course will thereafter be used in the computation of the student's cumulative grade point average. The earlier grade will, however, remain on the transcript.

Grade point averages are computed for each student by semester, year, and cumulatively. The fall semester grade point average includes the courses taken in the fall semester and courses taken in the preceding summer session. The yearly grade point average is based upon courses taken during a student's first, second and third years.

### Course Repeat Policy

The School of Law's Standards and Readmissions committee has adopted the following course repeat policy:

1. Students who petition the Standards Committee for readmission may be required to repeat any or all courses previously completed;
2. Students who achieve a grade in a course above the graduating average are not eligible to repeat that course;
3. Students who achieve a passing grade in a course that is below the graduating average are eligible to petition the Standards Committee for permission to repeat the course. The Standards Committee may grant such petition based on exceptional circumstances;
4. Students who fail a non-required course are eligible to petition the Standards Committee for permission to repeat the course. The Standards Committee may grant such petition based on exceptional circumstances.
5. Students who fail a required course are required to repeat that course, unless, in exceptional circumstances, repeating the course is waived.

Note: When a course is repeated only the hours for one taking may be credited toward meeting the graduation requirement of having passed 89 hours, without regard to how the course is treated for computing grade point averages.

### Dean's List

A student qualifies for inclusion on the Dean's List with a semester average greater than 85.999.

### Good Standing

After the first semester of the first year, a student is in "good standing" at the School of Law if the student's cumulative GPA is greater than 76.399. Thereafter, a student is in "good standing" at the School of Law when both the student's current semester and overall GPA are greater than 77.499.

### Grades and Grading

The grades recorded in the School of Law are the official grades and the determination of grade point averages and satisfaction of law school requirements is based on the grades recorded in the School of Law.

Grades are recorded in the School of Law as numerical grades ranging from 65 through 100 or, where authorized, by the letters "S" (Satisfactory) and "U" (Unsatisfactory). The grades of S and of 70 through 100 are passing grades and carry course credit. The grades of U and of 65 through 69 are failing grades and carry no course credit. A 70 is the lowest passing grade and a cumulative grade point average greater than 77.499 is the minimum required for graduation.

With the exception of Independent Research, and any of the activities that satisfy the writing requirement, if grading is to be done other than anonymously, the syllabus shall so state. Professors do not know the names of students until after grades are turned in to the Dean's Office. Professors may not obtain the names of students prior to assigning a class rank order for grades. The rank order may not be changed after the names are known.

Explanation of the Grading Scale (<http://law.missouri.edu/students/pdf/gradingscale.pdf>) (PDF)

## Grades from myZou

Students may obtain their grades from MyZou. In addition to the student's PawPrint, when checking grades for only one course, students must know the course number.

## Student Honors

### J.D. Degree Cum Laude

Any student with a graduating grade point average greater than 96.999 is eligible for the designation of Juris Doctor Summa Cum Laude upon graduation.

Any student with a graduating grade point average within the top 7% of the graduating class is eligible for the designation of Juris Doctor Magna Cum Laude.

Any student with a graduating grade point average within the top 12% of the graduating class is eligible for the designation of Juris Doctor Cum Laude.

### Order of the Coif

The Order of the Coif is a national law school honor society, founded for the purpose of encouraging legal scholarship and of advancing the ethical standards of the legal profession. It has established chapters in the leading law schools of the country. Its members are selected by the faculty from the top ten percent of the graduating class and rank highest in scholarship and whose achievements as students make them worthy of this distinction. Selections are made after sixth semester grades and rankings have been determined. To be eligible for membership in the Order of Coif students must complete 75% of their law studies in graded courses. Accordingly, transfer students generally will not be eligible for membership.

### Order of the Barristers

The Order of the Barristers is a national law school honor society founded for the purpose of promoting legal advocacy and of advancing the ethical standards of the legal profession. Members are selected based upon participation and excellence in the advocacy programs of the School of Law.

## Graduate Academic Minors

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### Nondesigned minors

Nondesigned minors consist of course work constituting a unified plan of study that includes a minimum of nine hours of graduate course work. These minors should be listed on a student's plan of study; however, they are not listed on a student's transcript.

### Obtaining approval for a minor

Both designated and non-designated minors must be approved by the student's major adviser, the student's academic program director of graduate studies, and the Graduate School.

In addition, the inclusion and completion of a designated minor must be approved by the director of graduate studies (or academic program chair/program director) of the academic program or interdisciplinary group offering the minor.

## Graduate Assistants and Fellows

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### Graduate Assistantships

Graduate assistantships give students opportunities for professional experience, academic training and financial support while pursuing advanced degrees. Specific assignments vary by type of assistantship. Graduate assistantships generally entail 10-20 hours of work per week (.25 to .50 full-time exempt). Students who hold graduate assistantships are discouraged from working more than 20 hours per week for more than one semester during the period of the assistantship.

### Fellowships

Fellowships are a type of aid granted to graduate students to help support their education. Some fellowships include a tuition waiver or a payment to the university in lieu of tuition. Most fellowships include a small stipend to cover living expenses. Unlike a loan, a fellowship is a form of gift aid and does not have to be repaid. However, fellowships may be taxable and reportable to the Internal Revenue Service. No service or work requirement is associated with a fellowship.

### Assistantship and Fellowship Policies

The complete set of policies regarding graduate assistantships and fellowships may be found on the Graduate School's website (<http://gradschool.missouri.edu/policies/graduate-assistantships-fellows.php>).

## Graduate Certificates

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A graduate certificate is not a graduate degree. Rather, it is a document verifying the successful completion of a specified group of graduate courses. Certificates are intended to help students acquire (or enhance) discipline-related knowledge and skills. Upon completion of a designated set of courses and other requirements, the name of the graduate certificate will appear on the student's official University of Missouri Transcript.

To accommodate a variety of learners' needs, MU offers two types of graduate certificate programs:

- Stand-alone graduate certificates allow individuals to earn graduate credit hours without having to enroll in a specific degree program. Prospective students have an option to apply to the Graduate School

as a Certificate-Seeking Student only. Degree seeking students may also pursue this type of certificate as complementary to (or independent of) their graduate degree program.

- Degree-dependent graduate certificates are designed for degree-seeking students only. Further, the students must be enrolled in the particular degree program offering the certificate. In other words, this type of certificate is intended for degree seeking students who wish to pursue specialized courses or related, complementary study.

#### Federal Disclosure Requirements for Stand Alone Graduate Certificates

"Final regulations published in the Federal Register on October 29, 2010, require institutions to report certain information about students who enrolled in Title IV eligible educational programs that lead to gainful employment in a recognized occupation (GE programs). those regulations also provide that institutions must disclose to prospective students certain information about the institution's Ge programs.

Finally, the new regulations require institutions to notify the Department if they wish to add an additional GE Program to its list of Title IV eligible programs. All of these requirements are effective July 1, 2011. The Secretary published additional regulations related to the program eligibility metrics that will be calculated for gainful employment programs in the Federal Register on June 13, 2011."

Source: Federal Student Aid, see <http://www.ifap.ed.gov/GainfulEmploymentInfo/index.html>

At the University of Missouri, the Graduate School's Stand Alone certificates are subject to federal Gainful Employment disclosure requirements. A disclosure form for each Stand Alone certificate may be found in the last section of this catalog and on our web site.

## Certificate Admission Information

Stand-Alone Certificate Applicants. All students enrolled in a stand-alone graduate certificate program will be classified as Graduate Certificate-seeking graduate students. As such, to qualify for admission, they must have successfully completed the baccalaureate degree at an accredited college/university. Specific graduate certificate programs may have admission standards that exceed those for post-baccalaureate graduate students. New graduate applicants wishing to pursue a stand-alone certificate only should complete the Graduate School's online application for admission and meet the Graduate School's minimum admission requirements for all programs.

## Degree-Dependent Certificate Applicants

New applicants applying for a degree program should complete the Graduate School's online application for admission for the degree program. Once enrolled at MU, the Application for Graduate Change of Division, Program, Degree Emphasis or Adviser Form (pdf) should be completed to add a graduate certificate.

## Financial Aid

Check eligibility on both types of certificates Degree-dependent graduate certificate programs are federal financial-aid-eligible. Students only enrolled in stand-alone graduate certificates are potentially eligible for federal financial aid. Read our disclosure pages to learn more about the costs (tuition & fees); time needed to complete the certificate; and future placement (e.g., degree programs, jobs) of certificate holders. Next, check with MU Student Financial Aid Office to determine eligibility. Students enrolled only in a stand-alone graduate certificates are not eligible for scholarships, fellowships, assistantships, tuition waivers, etc. from the Graduate School or University of Missouri.

## Stand-Alone Certificate Admission Requirements for Non-Degree Seeking Students

A non degree-seeking student who is admitted into a stand-alone certificate program will be officially classified as "certificate-seeking" graduate student. To be admitted, the student must have successfully completed a baccalaureate degree at an accredited college/university. Specific graduate certificate programs may have admission standards that exceed those for post-baccalaureate graduate students.

Transfer credit for stand-alone certificate seekers. A maximum of three graduate credit hours which correspond directly to the MU graduate certificate program course requirements may be used as transfer credit from another university to satisfy the requirements for the certificate program. An original transcript from the other university, verifying graduate credit received for the requested hours of transfer credit, must be submitted to the Graduate School when the Plan of Study form is submitted. Please refer to the certificate program's site for certificate policy updates.

## Credit Hours Necessary for Certificate Completion

Graduate certificates vary in completion requirements, including the minimum credit hours. Please refer to the certificate program's site for credit hour requirements.

Up to 12 hours of graduate credit earned for graduate certificate may be applied to degree requirements for a graduate degree upon approval of the degree program.

## Grievances (L)

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The School of Law is a charter member of the Association of American Law Schools. Information on the AALS may be found at their web page <http://www.aals.org/>.

The School of Law is fully accredited by the American Bar Association. Questions regarding ABA accreditation may be directed to the Office of the Consultant on Legal Education, American Bar Association, 321 N. Clark Street, 21st Floor, Chicago, IL 60654-7597, (312) 988-6738.

Student complaints implicating compliance with the standards imposed by the American Bar Association Section on Legal Education and Administration to the Bar shall be filed in writing with the Associate Dean for Academic Affairs, or if the complaint involves the person serving in that capacity, with the Dean of the Law School. The complaint shall include the date in which the complaint is being filed; the name and address of the complainant; and a description of the complaint. The description of the complaint shall include a description of the accreditation standard which the law school's action or inaction implicates. The Associate Dean for Academic Affairs (or the Dean of the Law School) will investigate the complaint and respond to the complainant in writing within 30 calendar days from receiving the complaint. The response will indicate whether the Law School has taken any corrective action, or if not, the reasons for not taking any action.

Students who have a grievance not implicating the ABA accreditation standards may file it with the Student Bar Association which has a Grievance Committee that meets periodically with the Dean or Associate Dean.

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## Holds

There are several types of holds, which are restrictions that may block registration. Students are notified on myZou if they have a hold. They should go to the office indicated on the individual hold to resolve the hold.

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## Late Registration

A student cannot register in classes offered by any school or college after one week following the first day of classes in a regular semester or the equivalent period of time for other sessions or classes. Class session meeting dates may be found in the class details on myZou (<http://myzou.missouri.edu>).

A late registration fee equal to the tuition for one undergraduate credit hour will be assessed starting the first day of classes for the regular session for the term.

Exceptions to this rule are enrollments in class sections of graduate exam, internships, problems, research and special readings.

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## Leave of Absence (G)

### Key Terms

#### Leave of Absence

The student anticipates a need to discontinue enrollment for one or more semesters.

#### Active Duty Leave or Withdrawal

Students who are members of the US Military (e.g., Reserve or National guard) may be called into active duty by the government. As a result of the assignment, the student may need to request an active duty leave or may decide to withdraw from the University.

#### Contact Adviser and Director of Graduate Studies

Students considering a leave of absence that will result in a break in enrollment of one or more semesters must first contact their graduate adviser and the academic program's director of graduate studies to inform them of their intent, the reason requesting leave and the expected duration.

#### Letters to the Graduate School Office

After approval of the leave at the academic program level, the director of graduate studies and the student will submit letters to the vice provost/dean of the Graduate School. The DGS letter will verify that the academic program has been informed and that a leave of absence has been approved. The letter from the student will provide an explanation for the request as well as the anticipated departure and return date.

#### Resolving Financial Support Responsibilities

It will be the responsibility of students to resolve all issues pertaining to their support (e.g., research or teaching assistantship, scholarship) with their adviser or other relevant authority before departure. These issues include the date when support will be terminated and whether or under what conditions the student will be reinstated for support upon their return.

## Notification for Re-Entry

Before the completion of the Leave of Absence, the student must notify the academic program's director of graduate studies and the Graduate School so that the re-entry process can be initiated.

## Contact with the University During Leave

Students on a Leave of Absence may not make significant use of University resources and services or engage in significant consultation with the faculty.

## Extension of Degree Time, Continuous Enrollment

Time spent on leave does not automatically extend limits for completion of the graduate degree but can be considered in a request for an extension.

Doctoral students who are required to maintain continuous enrollment may petition for an exception to this policy while they are on an approved Leave of Absence.

## International Students

International students in F-1 and J-1 non-immigrant status must also obtain authorization from the International Center before the initiation of a Leave of Absence and before returning to campus to ensure compliance with current SEVIS regulations and visa restrictions.

F-1 and J-1 students approved for a leave of absence may not remain in the United States during the leave period unless authorized by the International Center. For students who must depart the United States, leave periods exceeding five months will necessitate updated student immigration documentation for re-entry.

All international students considering a leave of absence should meet with an international student adviser to determine the appropriate steps to safeguard their immigration status.

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## Military - Active Duty

Enrolled students called into active service in the armed forces of the United States prior to the completion of the semester, whether voluntarily or involuntarily, but not including active service for training, shall be eligible for either of the options listed as follows: **NOTE: Students must choose either option 1 or 2**

Students taking distance / online classes who reside in states other than Missouri where a conflicting law may require other options than listed below will be given the accommodations required by that law when the student provides documentation of the law's existence and proof of its applicability to him/her. **Please note:** Students who are enrolled at the University of Missouri and reside in a state outside of Missouri should review the information below related to unique military deployment benefits:

State of Iowa "Code Section 261.9(1)"g" (<http://www.iowacollegeaid.gov/PostsecondaryRegistration/iowacodechapter261b.html#ComplianceRequirements><http://www.iowacollegeaid.gov/PostsecondaryRegistration/iowacodechapter261b.html>)

## Option 1 - Withdrawal from all courses for semester

They may choose to withdraw from all classes. In such cases, a student may request either:

1. That the official transcript indicate the courses from which he or she has withdrawn, the date of withdrawal and the reason for withdrawal. Students choosing this option will have their tuition and fee charges and their student financial aid eligibility calculated effective with their official withdrawal date.
2. Or the student may request that all courses for that semester be expunged from the student's academic record. Students taking this option will receive a complete refund of all educational and incidental fees paid by the student for enrollment for that semester. However, students who have received federal, state or institutionally funded financial aid must return all aid disbursed to them for the semester

**NOTE:** Students must see their Academic Advising Unit to withdraw and return the form to Office of the University Registrar, 125 Jesse Hall.

Refunds will not be immediately available. Refunds are based on your last method of payment (i.e. credit card, check, etc). Refund checks will be sent to your mailing address unless a forwarding address is left with the University.

## Option 2 - Receive Incompletes in all courses for the semester

The student may choose to receive an incomplete in all courses not yet completed for the semester. In that case the following rules apply:

- The student must complete all course work for the semester to the satisfaction of the instructor(s), and the time a student spends on active military duty shall not be counted against time allowed for the completion of an "Incomplete" grade.
- **I to F policy:** Students called to active military duty will be exempted from the one-year automated changes of I to F grades for the term of deployment and the year prior to deployment. In accordance with State statute, students may complete work upon their return from duty or may choose to maintain the I grade. Therefore, I grades for students called to active military duty will remain listed as "I" until a change of grade is submitted by the faculty member, or indefinitely, if so desired by the student.
- **NR to F Policy:** Military duty will be exempted from the one -year automated changes of NR to F grades for the term of deployment and the year prior to deployment. In accordance with State statute, students may choose to maintain the NR grade. Therefore, NR grades for students called to active military duty will remain listed as "NR" indefinitely, if so desired by the student.

Upon completion of all course work for the semester, the student may choose either to:

1. Have the grade earned for the course and have the "Incomplete" expunged from his or her official record  
OR
2. Have the "Incomplete" grade remain as the final grade with reason for the "Incomplete" noted on his or her official record

**NOTE:** No refunds will be given for option 2.

**Residential life:** Residential life will be contacted and informed of your intent to exit the University. Room, board and social fees will be prorated

and applied to your University student account based on the effective date of your official check out from the residence hall or other University accommodations.

**Financial Aid:** The Office of Student Financial Aid will be informed of your student status and your official withdrawal date and may make adjustments according to federal, State of Missouri and institutional guidelines.

**Scholarships:** Scholarships may or may not be applicable upon the student's return to the University. For example, Section 41.948.2, RSMo, provides that if a student has been awarded a scholarship to be used to pursue an academic program in any higher education institution in Missouri and he or she is not able to complete the term for which the scholarship was granted, the student shall be awarded that scholarship at any subsequent academic term provided the student returns to the academic program at the same institution at the beginning of the next academic term after the completion of active military service. If a student has any scholarships or other aid or award, he or she should contact the issuer to determine whether it will be applicable on his or her return and whether he or she will need to satisfy any other conditions.

### Contact:

Office of the University Registrar  
125 Jesse Hall  
The University of Missouri - Columbia  
Columbia, MO 65211  
Office: (573) 882-7881  
Fax: (573) 884-4530

### The Office of the University Registrar will require the following information:

- A copy of your military orders, as soon as possible
- Forwarding Address
- Name, address and phone number of a contact or your representative
- Your name as it is on MU records
- MU ID number
- Which option student wishes to choose for classes

This information may be brought to 125 Jesse Hall or faxed to (573) 884-4530.

## Re-admission of previously enrolled students

**Undergraduate** students who are returning to MU after an absence of at least one semester must complete a request for re-admission for undergraduate studies (<http://admissions.missouri.edu/apply/re-admission>) and return it to the Office of Admissions, 230 Jesse Hall, Columbia, MO 65211-1300 or fax to 573-882-7887.

Degree-seeking **graduate** students who are returning to MU after an absence of at least two semesters must complete a graduate school re-activation form (PDF) (<http://gradschool.missouri.edu/admission/former-grad/reenroll.pdf>) and return it directly to the academic program for approval. Post-baccalaureate (non-degree seeking) graduate students should return the completed form to the Graduate Admissions Office, 210 Jesse Hall, Columbia, MO 65211-1160 or fax it to 573-884-5454.

View Missouri Revised Statutes Chapter 41 (41.948) (<http://www.moga.mo.gov/statutes/C000-099/0410000948.HTM>). This policy is implemented to assure that students called to active duty prior to

the end of a term receive fair and just treatment, both financially and academically.

Contact the Office of the University Registrar-Registration for more information at 573-882-7881.

## Name Changes

Current students and alumni of the University of Missouri may change their names in the student records system for the University of Missouri during or after attendance according to the following:

1. For a student to change his/her name, legal documentation is required of the student's new name and verification that he/she was previously known as the name in the MU records system.

For Undergraduate students, a name change may be processed either in person, at the Office of Admissions, 230 Jesse Hall, or through the mail provided the necessary documentation is submitted. The mailing address is: Office of Admissions, 230 Jesse Hall, University of Missouri, Columbia, MO 65211.

For Graduate and Professional students, a name change may be processed either in person, at the Graduate School, 210 Jesse Hall, or through the mail provided the necessary documentation is submitted. The mailing address is: Graduate School, 210 Jesse Hall, University of Missouri, Columbia, MO 65211.

2. The student must submit a **minimum of two of the documents** listed below, one from list a. Proof of use of former name and one from list b. Proof of legal change to new name. **At least one of the documents must have date of birth, a photograph, and a signature:**
  - a. Proof of use of former name
    - i Former government issued government ID card such as a driver's license, military ID, passport
    - ii A federally recognized Indian tribe's enrollment card or a US Bureau of Indian Affairs identification card containing the signature and photograph of the individual
    - iii School yearbook with photo
    - iv Previously-issued Social Security Card
  - b. Proof of legal change to new name
    - i Current, government-issued ID card such as a driver's license, military ID, passport
    - ii Current, valid Social Security Card with new name
    - iii A federally recognized Indian tribe's enrollment card or a US Bureau of Indian Affairs identification card containing the new name, the signature and photograph of the individual
    - iv A certified copy of a court order or a marriage certificate or a dissolution decree reflecting the new name in full
3. Students may abbreviate their middle name(s) without documentation. Documentation is required if a student is adding or deleting a middle name or changing an initial to a name.

## Non-Degree Graduate Study

The Non-Degree Graduate Student Program allows post-baccalaureate students to complete graduate courses without being formally accepted into a degree-granting program. Many students use this enrollment option to explore a discipline, take courses for career advancement, prepare for

application to a graduate degree program, or as personal enrichment. This program is administered by the Graduate School.

Once enrolled, the non-degree graduate student may take undergraduate- or graduate-level courses but hours earned are not credit toward a graduate degree. However, if the student is later admitted to a degree-granting program, up to 12 hours of earned graduate credit may be applied toward a graduate degree program, at the discretion of faculty in the admitting academic program.

Students admitted under the non-degree seeking status have access to MU libraries, museums, laboratories, and recreational and athletic facilities.

Note: To manage course enrollment, some academic programs may limit available courses to non-degree graduate students. Contact the academic program in which you wish to take courses for more information.

## Eligibility

Applicants who hold a baccalaureate degree or its equivalent from a U.S. university or a university in which instruction is in the English language may be admitted to MU as non-degree graduate students.

## International Student Eligibility

International students residing in the United States who do not satisfy the above requirement and are seeking admission as post-baccalaureate graduate students must provide evidence of proficiency in English. Either a minimum score on the TOEFL or IELTS or a minimum of 24 semester credit hours in which the student maintains a 2.0 GPA (A=4.0) in a degree program in which English was the primary language is required. The minimum required TOEFL score for entrance to the Graduate School is 500 paper-based, 61 internet-based. The Graduate School also accepts a 5.5 Academic IELTS score for admission to the Graduate school. Please consult your academic program of interest to determine if it requires higher TOEFL or IELTS scores for admission.

The University of Missouri will not issue I-20s to international students so that they may enter the United States to become non-degree graduate students.

## Tuition and Fees

Non-degree graduate students must pay graduate educational and student activities fees regardless of whether they take graduate or undergraduate courses.

## Financial Aid

Non-degree graduate students are not eligible to receive federal financial aid or veteran's benefits or to hold campus-sponsored assistantships.

## How to Apply for On-Campus Non-Degree Study

- Complete and submit the Graduate School Application ([https://app.applyyourself.com/AYApplicantLogin/fl\\_ApplicantLogin.asp?id=umc-grad](https://app.applyyourself.com/AYApplicantLogin/fl_ApplicantLogin.asp?id=umc-grad)). The Graduate School encourages applicants to use the online application. The submission of a hard-copy application (PDF) (<http://gradschool.missouri.edu/forms-downloads/repository/gradapp.pdf>) will slow the application review process.



- Submit the application fee, (<http://gradschool.missouri.edu/admissions/eligibility-process/non-degree-applicants/application-fee.php>) which is \$55 (US) for domestic applicants and \$75 (US) for nonresident international applicants. You can pay the fee online through the Graduate School's online application.
- Official transcripts or mark sheets must be sent directly from each university or college you have attended to the Graduate Admission Office, 210 Jesse Hall, Columbia, MO 65211. Transcripts/mark sheets for all baccalaureate degrees or their equivalents and any additional degrees must be sent. At this time, the Graduate School only accepts hard copies of transcripts. All transcripts/mark sheets become the property of MU.
- Standardized test scores, such as the GRE, are not required for non-degree graduate applicants. See below for the transfer and use policies for non-degree courses taken at MU.

## How to Apply for Online Non-Degree Study

If you are planning to take course work online or at a distance, please contact Mizzou Online (<http://online.missouri.edu>) about course offerings and registration. The application process is different for online-only students.

## Maintaining Good Standing

Non-degree graduate students must maintain a 3.0 GPA. If the cumulative GPA is less than 3.0, the student will be given one automatic probationary semester. If, after one semester of probation, the student's cumulative GPA does not reach 3.0, the student may be granted a second probationary semester following a successful written petition made directly to the dean of the Graduate School. (Summer sessions are not counted as probationary semesters.) If the student fails to achieve a cumulative GPA of 3.0 following the second probationary semester, the student will be made ineligible to enroll as a non-degree or degree-seeking graduate student. If at any time a student's term or cumulative GPA falls below 2.0, the student will be ineligible to enroll as a non-degree or degree-seeking graduate student.

## Switching Student Status from “Non-Degree” to “Degree-Seeking”

Non-degree graduate students who want to earn a graduate degree (master's, doctoral or educational specialist) must:

- Submit official scores, if required by the degree program of interest (<http://gradschool.missouri.edu/academics/programs>), from an appropriate graduate admission examination (GRE, GMAT, MAT). The scores must be sent directly from the examination service to Graduate School Admissions, 210 Jesse Hall, Columbia, MO 65211.
- Meet Graduate School minimum admission requirements (<http://gradschool.missouri.edu/admissions/eligibility-process>).
- Apply directly to the degree program of interest using a Change of Degree form (PDF) (<http://gradschool.missouri.edu/forms-downloads/repository/change-degree.pdf>).

## Posthumous Degree Awarding (G)

### Honoring Deceased Graduate Students

The following policies and procedures apply in instances in which a graduate student dies before being awarded a degree.

### Student Completed All Degree Requirements

If the student has completed all degree requirements, the college or school's representative (dean, assistant/associate dean or director) will contact the Office of the Provost and the vice provost for advanced studies and dean of the Graduate School to nominate the individual to receive a posthumous degree.

The diploma for the degree that the student was pursuing will be prepared in the same manner as if the student had lived. This diploma may be presented to the family of the deceased in a special ceremony, at Commencement or in whatever manner is deemed appropriate.\*

### Student Did Not Yet Complete Degree Requirements

If the student had not completed degree requirements but was making satisfactory progress at the time of death, a dean's certificate honoring the student can be provided by the appropriate academic unit(s). These certificates may be designed and presented in a manner that is fitting to the circumstances.\*

\* In some instances, presentation of the degree or certificate to family members may be made at a remembrance ceremony.

## Refund of Fees Policy

### Exceptions to published tuition and required fees assessment policy and charges

1. The Office of the University Registrar and the vice provost for enrollment management are charged with considering and approving exceptions to published tuition and required fees assessment policy.
2. Any change in assessment can be adjusted or pro-rated only to a rate already established in the published university tuition and required fees schedule.
3. Only tuition required related to a student's assessment for registration in credit hours are covered by these guidelines. Other required fees such as those for residence halls, the bookstore, etc. need to be directed to departments responsible for assessment of those required fees.
4. Grade assignments and other academic issues are not within the scope of these procedures and should be addressed to the dean of the college or school in which the student is enrolled for further direction.

### Initial appeal by a student

1. An appeal and all pertinent written documentation must be submitted in writing within 90 calendar days of notification of assessment, adjustment or refund. In cases of incapacitation, exceptions may be made on a case-by-case basis.

Minimally, each written appeal must be dated and include the student name, address and phone number, student number, signature of the student, statement describing specifically what is being requested and for what term, statement of any extenuating circumstances, and why the request should be honored.

2. All appeals must be submitted to the Office of the University Registrar, 125 Jesse Hall. Appeals must meet one or more of the following criteria to be considered and approved:
  - a. Written documentation of an illness, accident, injury or situation that could not be influenced, planned for, or prevented by the student or the institution and which subsequently caused a change in the student's enrollment, thus changing the assessment. This provision specifically excludes conditions or chronic illnesses that remain static and are known to the student at the time of enrollment.
  - b. Written documentation of substantiated circumstances involving deadlines where a student has in good faith relied on information provided by a named University official, or the official's interpretation of the text of a University document or publication, and was consequently misled or mistaken about its terms.
  - c. In individual cases and when it is in the best interest of the student and the institution, the University registrar or his/her designated assistant registrar may grant an exception that is not deemed to be served appropriately by the exception criteria stated elsewhere in this document.
3. Decisions will address only whether an adjustment of charges will be made. Grade assignments and other academic issues are not within the scope of these procedures and should be addressed to the dean of the college or school. Record changes, such as requests to withdraw, drop, add or enroll for courses in a term that has ended must be submitted on a separate form to the Revision of Records Committee, c/o the Office of the University Registrar, 130 Jesse Hall.
4. Generally, grounds for consideration of an appeal will be restricted to those circumstances personally experienced by the enrolled student with whom the University has a direct relationship.
5. Decisions will be rendered by the designated official of the Office of the University Registrar and will be based solely upon any and all pertinent written documentation.
6. Notification of the status of the tuition appeal will be made in writing within 10 calendar days of receipt of the written appeal.

## Appeal of the decision rendered by the Office of the University Registrar

1. Upon written request a student may appeal the decision rendered by the Office of the University Registrar.
2. A written appeal must be submitted to the Office of the University Registrar.
3. The written appeal must request a review of the original decision and may contain additional written documentation to support the appeal.
4. The appeal will be reviewed by the same designated official. If the appeal information is sufficient to overturn the original decision, the designated Office of the University Registrar official can direct staff to issue a tuition refund or adjustment in accordance with appropriate fiscal procedures.

If denied within 10 calendar days of receipt, the information must be forwarded to the University Registrar. If the appeal is denied a second time by the University Registrar, it may be forwarded to the vice provost for enrollment management for further consideration, upon the student's request.

The decision rendered by the vice provost for enrollment management is the final University determination on the matter.

## Refund of tuition and fees in the event of a student death

1. When a student dies prior to completing the current academic semester, a full refund of or credit for tuition and required fees will be made after the deduction of the following:
  - a. Any required adjustments to scholarships, grants or loans determined by federal formula applied by the Office of Student Financial Aid.
  - b. Any other debts owed to the University that occurred prior to the death of the student.
2. Any refund will be made payable to the student.
3. If, after all adjustments are made, there still remains a debt to the University, generally the University would not attempt to recover the debt from the estate of the deceased student.

## Students called to active military duty

Enrolled students called into active service in the armed forces of the United States prior to the completion of the semester, whether voluntarily or involuntarily, but not including active service training, and unable to complete their course work, shall be eligible for two options. The options are implemented to assure that students called to active duty prior to the end of a term receive fair and just treatment, both financially and academically. Contact the Office of the University Registrar at 573-882-7881 for more detailed information.

## Students called to jury duty

Full refunds (100 percent) of required tuition and any applicable required fees for all credit hours from which a student withdraws, when following University procedures announced by the provost.

## Residency (L)

The School of Law residence rules satisfy the requirements of the American Bar Association and the Association of American Law Schools. The purpose of the residency requirements is to assure that the study of law will be spread evenly over a minimum period of six semesters or the equivalent.

The rules regarding the size of a student's course load -- the number of hours a student enrolls for in a given semester -- and residency rules -- are not the same.

The residency requirement means that students may not graduate in less than six semesters or the equivalent. Students who plan to attend summer school for two years and graduate a semester earlier, should visit with the Associate Dean for Academic Affairs concerning their summer course loads.

For residency purposes a minimum load of twelve hours is required for a semester. For purposes of accelerated graduation, minimum residency hours for a summer session are five if combined with another summer session of no less than seven hours. Two summer sessions of six hours

each serve the same purpose. If fewer hours are taken in a summer session, they may not be used toward residency for the purpose of accelerated graduation but may be combined with an appropriate number of hours in a regular semester in order to fulfill a twelve hour semester residency requirement.

Students completing more than twelve hours in a semester may not use surplus hours over twelve toward residency in any other session; hence the three surplus hours from a fifteen hour semester cannot be added to a subsequent nine hour semester to give residency for two semesters. On the other hand, a nine hour semester can be combined with a three hour summer session to give residence for one semester.

In cases of extreme hardship the Faculty may make a slight variance in the residency requirements, but cannot go below the standards set by the American Bar Association and the Association of American Law Schools.

## Revision of Records

The Committee for Revision of Records reviews petitions from students asking for changes to their academic records. Students should discuss the petition process with their adviser before appealing to the committee to verify that changes are warranted and will benefit the student.

### Instructions for completing petition to the committee

Students must:

- Obtain forms from the appropriate school or college advising office and discuss their case with their adviser.
- Complete the forms, being as thorough and specific as possible. You must sign and date the petition(s).
- Leave the petition with the class instructor, who will forward it to the department chairperson. The chairperson will return it to the dean's office, which will send it to the Office of the University Registrar. Signatures of the instructor, department chairperson and dean *must* be obtained before the committee will consider the petition.
- Provide specific dates if requesting to backdate a withdrawal from the University. A separate form is required for each class.
- Supply documentation or evidence to support the petition. For example, if a student has a medical justification, please supply the medical certification form. Obtain forms from the academic units.

### General guidelines

- The committee cannot change a grade given by an instructor. If a student disagrees with a grade, they must contact their instructor and then follow the appropriate appeals process. An instructor cannot change a letter grade to "W" unless a withdrawal has been approved.
- If the committee approves a requested change and additional charges apply, payment must be made before the transcript changes.
- The committee reviews all complete petitions, and its decisions are based on the information presented. Decisions are communicated in writing to the student. If the petition is approved, a transcript reflecting any changes will be included.
- The committee cannot grant refund appeals. Students must complete a refund appeal form (PDF) (<http://registrar.missouri.edu/forms/fee-adjustment-appeal-form.pdf>).

The committee is composed of faculty appointed by the chancellor. Members are anonymous and students are not allowed to

communicate directly with them. Forward questions to Victor Price at [PriceV@missouri.edu](mailto:PriceV@missouri.edu).

## Student Conduct (L)

The academic life of students at the MU School of Law is governed by a Code of Honor that has been adopted by the Faculty and the Student Bar Association.

Students should note that they generally will be required to report any Honor Code violation on state bar application forms.

The Honor Code is available at <http://www.law.missouri.edu/students/policies/conduct.html>.

## Student Employment (L)

In December 1998 the American Bar Association Section of Legal Education Accreditation Committee requested the Law School establish a faculty approved policy on student employment in accordance with Standard 304(c) of the ABA Standards for the Accreditation of Law Schools. At its meeting on February 16, 1999, the Faculty of Law adopted the following policy which mirrors the ABA requirement:

**"The Law School shall not award full-time residence credit to a student who does not devote substantially all of the student's working hours to the study of law or engages in employment for more than 20 hours per week, whether outside or inside the Law School."**

Further, the faculty acknowledged ABA Interpretation 304-7 which requires that:

**"a law school shall demonstrate that it has adopted and enforces policies ensuring that individuals enrolled as full-time students devote substantially all working hours to the study of law including the implementation of policies relating to...limitation on employment..."**

This memo serves as notice to the entire Law School community of the policy, with the expectation that it will be followed. The enforcement of this policy will be undertaken as follows:

**For all law students who are employed by the School of Law in any capacity, including research assistant or other part-time student employment, the School of Law cannot process for payment time sheets which indicate more than 20 hours per week of work. Law School faculty and staff are not authorized to permit or require law student employees to work more than 20 hours per week.**

The 20-hour rule does not apply to the period of time between semesters, or the summer (unless the student is enrolled full-time in law school,) or spring and fall breaks.

## Student Level

Students are assigned to a particular class level based upon the number of credits they have completed in accordance with the following limitations:

Class	Credits
Freshman	0 to 29 credits
Sophomore	30 to 59 credits

Junior	60 to 89 credits
Senior	90 or more credits

For registration purposes, student level will be determined by earned credits plus those credits in progress at MU. Undergraduate students pursuing degree programs at other institutions who enroll at MU as visiting students will generally be considered as freshmen, non-degree students. They are not assigned to a school or college. This applies to students who enroll under agreements with the Mid-Missouri Associated Colleges and Universities as well as those from other colleges and universities.

## Theses and Dissertations: Submission Deadline, Review and Public Disclosure

### Formatting the Thesis

A thesis, when required for a master's program, must be written on a subject approved by the candidate's advisory committee. The thesis must be the student's own work and must demonstrate a capacity for research and independent thought. Refer to the Master's Degree section for details.

Thesis formatting guidelines may be found at <http://gradschool.missouri.edu/policies/thesis-dissertation/guidelines/>. Students must follow the style manual recommended by their academic program. All work must be properly cited and permission to use copyrighted materials must be obtained prior to submission.

### Formatting the Dissertation

A dissertation is required for all doctoral programs and must be written on a subject approved by the candidate's advisory committee. The dissertation must include the results of original and significant investigation, and it must be the candidate's own work. Refer to the Doctoral Degree section for details.

Dissertation formatting guidelines may be found at <http://gradschool.missouri.edu/policies/thesis-dissertation/guidelines/>. Students must follow the style manual recommended by their academic program. All work must be properly cited and permission to use copyrighted materials must be obtained prior to submission.

### About Third-Party Copyright

If your work contains material that has been copyrighted by another party, you may need to seek permission to use the material in your thesis or dissertation. Examples of materials for which you would need to seek copyright permission include but are not limited to: third-party software, images, graphics, large portions of text and maps. If copyright permission is needed, you must submit written approval for the use of the copyrighted material along with your thesis or dissertation.

### Substituting for Copyrighted Materials in Theses and Dissertations

The Graduate School encourages students to seek permission to use copyrighted material in their theses and dissertations. Your work is published after it is submitted in approved form to the Graduate School, and it will be available to audiences who wish to know more about the subject you investigate. The more full and complete the thesis or dissertation, the better the experience for your reader and therefore

the better the response to the fruits of your hard work. However, if you are unable or unwilling to obtain copyright permission for some of the materials in your research, you may substitute for the copyrighted material as described below.

*Acceptable substitutions include:*

- Redrawing or tracing of maps, images, graphics, etc
- References to URLs, printed documents, or physical locations where the copyrighted material can be found

A student whose thesis or dissertation has had copyrighted material removed prior to submission must have his or her adviser sign a document reading:

[Student's name] has removed copyrighted material from the copy of the thesis or dissertation submitted to the Graduate School for electronic publication. I certify that:

- I approve the thesis or dissertation in this form;
- The student has presented accurate information as to where the removed, copyrighted material can be found

Adviser's name (signature line) Date (date line)

### Submission Deadline for a Thesis or Dissertation Following Committee Approval

Each semester the Graduate School establishes semester deadlines for the Report of the Examining Committee (master's & EdS students), Report Dissertation Defense (doctoral students), and submission of theses, dissertations and supplemental materials. Those deadlines may be found on the Graduate School's page.

<http://gradschool.missouri.edu/about/news-events/events/index.php>

After successful defense of the thesis or dissertation, students must comply with their academic program's and/or the International Center's enrollment requirements.

Generally, based upon input from the thesis/dissertation committee, a student will make corrections to a thesis/dissertation. The student will prepare the final document and supplemental materials in the required format (<http://gradschool.missouri.edu/policies/thesis-dissertation>) and submit everything to the Graduate School by the semester deadline. In the event the student misses the current semester deadline, the student is required to submit the final dissertation or thesis by the end of the following semester after a successful defense. If an extension is needed, the student's advisor and program's DGS must submit a request for an extension letter to the Graduate School Dean.

### Submission Requirements and Forms

A thesis or dissertation must be presented before the deadline to the MU Graduate School on a high-quality CD. The thesis or dissertation must be contained in a Portable Document Format (PDF) file (<http://gradschool.missouri.edu/policies/thesis-dissertation/guidelines/technology-ch7.php>), with the appropriate margins and formatting. For the 2009-2010 academic year, the CD must be readable on a standard PC running Windows XP. Additional electronic files must be included (<http://gradschool.missouri.edu/policies/thesis-dissertation/guidelines/supplements-cd-ch4.php>) on the CD as PDF documents with the appropriate file name. If all files will not fit on one CD, a DVD or multiple CDs may be used, as long as no single file is split between CDs.

## Paper Documents that Accompany the Electronic Submission

Several paper documents must be submitted with the CD, including the original signed Approval of the Committee page, paper copies of the Short Academic Abstract and Title Page, fees forms, release forms, and copyright agreement forms. See <http://gradschool.missouri.edu/academics/thesis-dissertation/diss-thesis-guideline/supplemental-paper-materials/index.php> for more information.

## Review of Theses and Dissertations by the Graduate School

Before a manuscript can be accepted for publication in scholarly journals, it is examined by editorial board members, for conformance to specific format style guidelines in addition to validity of content. In much the same manner, MU Graduate School staff, acting as an editorial board, reviews every submitted thesis and dissertation for conformance to University guidelines. Failure to meet the appropriate standards will result in the rejection of your work.

## Copies of Theses and Dissertations

The MU library catalogs all thesis and dissertations in the Merlin system. To locate a thesis or dissertation go to the Merlin search engine. Theses and Dissertations submitted Fall 2004 and later are available electronically from the MU Graduate School's searchable Thesis and Dissertation Archive.

## Specific Questions about MU Theses or Dissertations?

Specific questions should be directed to the academic advising staff of the MU Graduate School, 210 Jesse Hall, (573) 882-9575 or (573) 882-3885 or 1-800-877-6312.

## Thesis and Dissertation Research Must be Open to Public Disclosure

Students are prohibited from using research (data, results, methods or other content) in their theses or dissertations that could restrict subsequent publication or public disclosure of these documents.

Examples of restricted information include classified or proprietary materials. It is important to note that these restrictions do not apply to non-thesis or non-dissertation research that is approved by the student's adviser and allowed by University of Missouri policies. Questions regarding the applicability of this policy to thesis or dissertation content should be referred to the MU Graduate School.

## Transfer Credit and Degree Applicability

- Transfer from a Regionally Accredited Missouri College
- Transfer from a Community College
- Transfer Within the UM System
- Military Transfer Credits
- Transfer Students and University General Education Requirements

## Credits and Transfers

After students are admitted to the University of Missouri (MU), an admissions evaluator will evaluate whether any college credit earned

elsewhere is transferable to MU. Coursework being transferred from schools outside of Missouri may need faculty review, which can delay the evaluation process.

- Advanced Placement (<http://admissions.missouri.edu/apply/ap-ib-and-college-credits/advanced-placement-program.php>) credit is only awarded based on official score reports sent to MU directly from the College Board, and not based on scores reported on transcripts.
- Dual credit (<http://admissions.missouri.edu/apply/ap-ib-and-college-credits/dual-credit.php>) must be evaluated by Admissions prior to being awarded.
- All courses transferring from community colleges will transfer as lower-division credit.
- Students should check MU's transfer course equivalencies ([https://myzou.missouri.edu/psp/prdpa/EMPLOYEE/HRMS/c/UM\\_SELF\\_SERVICE.UM\\_TRNSFR\\_EQUIV.GBL?PORTALPARAM\\_PTCNAV=UM\\_TRNSFR\\_EQUIV&EOPP.SCNode=HRMS&EOPP.%2520Credit&EOPP.SCPTfname=HCCC\\_TRANSFER\\_CREDIT&AITS\\_HDR\\_CO](https://myzou.missouri.edu/psp/prdpa/EMPLOYEE/HRMS/c/UM_SELF_SERVICE.UM_TRNSFR_EQUIV.GBL?PORTALPARAM_PTCNAV=UM_TRNSFR_EQUIV&EOPP.SCNode=HRMS&EOPP.%2520Credit&EOPP.SCPTfname=HCCC_TRANSFER_CREDIT&AITS_HDR_CO)) for detailed information on most schools in Missouri and select out-of-state institutions. Students interested in seeing how transfer courses might apply toward MU degree requirements can go online to [transfer.org](https://www.transfer.org) (<https://www.transfer.org/uselect/login.htm>) to enter course data, review equivalencies, and produce an unofficial degree audit.
- The Mizzou Connection Program (<http://admissions.missouri.edu/apply/transfer/mizzou-connection>) is available for students wishing to transfer from Moberly Area Community College of MU.
- Advanced standing credit in a foreign language awarded by previous institutions will not transfer to MU. It can be requested after you have successfully completed a course at MU at or above that level.
- Military veterans may be awarded some credit if they meet certain criteria (<http://admissions.missouri.edu/documents/military-credit.pdf>).

Generally, coursework completed at a regionally accredited institution and oriented toward a baccalaureate degree will be accepted if each grade is C or better. Generally, the following types of credit are exceptions that are excluded from transferable courses: Technical, vocation or remedial courses; Courses not intended for a baccalaureate degree and/or terminal vocational degree or certificate program; Courses from non-regionally accredited institutions, though there is an appeal process.

Questions should be directed to the MU Office of Admissions (<http://admissions.missouri.edu>).

## Transfer from a Regionally Accredited Missouri College

Students may transfer more than 64 credit hours of lower division courses from either Missouri associate degree-granting or baccalaureate degree-granting institutions. Any additional lower division course credits above 64 credit hours will be accepted in transfer if the credits are applicable to the baccalaureate degree or are prerequisites for an upper division course in the major, in accordance with the Missouri Coordinating Board's policy.

## Transfer from a Community College

Community college courses can only have transferable equivalents at the 1000 or 2000 level. At no time can a community college course be the equivalent of a University of Missouri-Columbia course of 3000 or greater.

If a 2000 level course title from a community college is similar to a 3000 level title on this campus, that course can be an elective in that department at the 2000 level. Individual schools and colleges can waive the requirement for a student to take a course with similar or same title on this campus, however there will be no direct transfer equivalency.

If a college or department wants to accept a course from a community college as an equivalency to a course numbered 3000 or greater, they need to give that course a new number of less than 3000.

Courses from a community college can account for six of the last 36 credits, but only for students who have general education or other 1000-2000 level courses remaining for their degree. (The University is not prohibited from accepting community college credit for juniors and seniors if it is at the 1000-2000 level.)

For additional information, contact the college or school from which the degree is sought or see Credits and Transfers (<http://admissions.missouri.edu/apply/transfer/credits-and-transfers.php>) information from the MU Office of Admissions (<http://admissions.missouri.edu>).

## Articulation Agreements

Contact departmental advisors for information on articulation programs and agreements.

## Associate of Arts Degree

An Associate of Arts degree (AA) is a two-year program that indicates the completion of a student's lower-division education. It also is a specific transfer degree for entry, at the junior level, into the general range of baccalaureate degree programs offered by the University.

Students transferring to MU from a regionally-accredited Missouri college or university with an AA degree and a certified 2.0 GPA will be accepted with junior standing. They will also have completed lower-division, general education requirements if the AA degree consisted of at least 60 credits of college-level work. These 60 credits must include completion of an institutionally-approved, general-education program of not fewer than 39 credits.

Students holding the AA degree are admissible to MU, but are not necessarily admissible to specific programs. Some of the specific programs with specialized lower-division requirements are the colleges of Business, Education, Human Environmental Sciences and the schools of Health Professions, Journalism, Nursing and Social Work. The transfer requirements for all academic units may be found in this catalog on the degree specific pages. Students applying with an AA degree from another state will have their courses reviewed for equivalency on an individual basis.

## Associate of Science Degree

An Associate of Science degree (AS) is a specialized degree intended for transfer into a specific, preprofessional program. Junior standing is guaranteed to the transfer student only if curricular details have been agreed on by MU and the institution granting the AS. Students who receive a specialized AS degree do not automatically qualify for junior standing in all MU programs. To enroll in some degree programs, students may have to take additional, general-education courses.

## Students without Associate Degrees

Students transferring without associate degrees must meet regular MU transfer admission standards.

## Transfer within the UM System

Students may transfer among campuses within the University of Missouri System. University of Missouri Policy states that "Any course that leads to an undergraduate degree on any campus of the University of Missouri shall be accepted in transfer toward the same degree on each campus of the University offering said degree." Students transferring within the UM system are still required to satisfy the course and residency requirements of the campus from which they wish to graduate. Grades, including D and F grades, and grade points earned will also transfer and be included in the cumulative UM grade-point-average.

For more information contact the following offices:  
University of Missouri - Columbia, Office of Admissions, 800-225-6075, [mu4u@missouri.edu](mailto:mu4u@missouri.edu)  
University of Missouri - Kansas City, Registration & Records Office, 816-235-1125, [registrar@umkc.edu](mailto:registrar@umkc.edu)  
Missouri University of Science and Technology, Registrar's Office, 573-341-4181, [registrar@mst.edu](mailto:registrar@mst.edu)  
University of Missouri - St. Louis, Office of the Registrar, 314-516-5545, [registration@umsl.edu](mailto:registration@umsl.edu)

## Military Transfer Credits

Military veterans, with at least two years of honorable service are allowed to transfer military course credit. The transcript coursework must have been accredited by the American Council of Education (ACE). Veterans are advised to contact University Admissions regarding specific transfer credit policies. An exception to current transfer credit policies is that military veterans be allowed a maximum of 9 hours credit as general electives. This policy began with military veterans enrolled for the Fall 2010 semester.

## Transfer Students and University General Education Requirements

All University, general-education requirements are considered completed for students who transfer to MU with an AA degree from a regionally-accredited Missouri institution. Transfer credits for other students are evaluated on a course-by-course basis. All students must complete University graduation requirements beyond the University general education requirements.

NOTE: Many departments, degrees and majors have more specific requirements for foundation course work in addition to the University, general-education requirement. However, the reverse is not true. Departments or academic units may not have fewer general education requirements than described by the University general education requirements. Careful planning will allow students to simultaneously meet University, general-education requirements and prepare for many of the more specific foundation courses required by their field of study.

## Transfer Credit (L)

### Credit Earned at Other Law Schools

A student may earn credits at another law school to be applied toward the JD graduation requirements of MU School of Law, on the following conditions:

- a. No more than 31 semester credits may be so applied. Grades in courses taken at other law schools are reflected in the transcript. However, those grades do not calculate in the student's grade point average.
- b. The law school at which the credits are earned must be, at the time of the student's work there, approved by the American Bar Association.
- c. The Standards Committee must approve, in advance of the student's work, the particular law school and the course of study the student will pursue there. In the case of work done in a Summer session, the approval of the Dean or Associate Dean may be substituted for that of the Standards Committee.

## Credit Toward LL.M. Requirements for Non-Law Courses/Transfer Credit

With approval of the Director of the LL.M. Program, students may apply to the LL.M. graduation requirements up to six (6) graduate credits of university or college courses from outside the MU School of Law. This limit includes independent study courses supervised by faculty in units other than the School of Law. Credit toward the LL.M. degree for a non-law school course will be granted only under the following conditions:

- The course must be a graduate-level course and clearly marked as such on the transfer transcript complete with credit hours and a grade. If taken at the University of Missouri-Columbia, it must be numbered 5000 or above.
- The transfer coursework is from a regionally accredited institution in the U.S. or an overseas institution that is recognized by its country's Ministry of Education as a graduate degree-granting institution.
- The course must involve at least 14 class-hours per credit (based on 50-minute class-hours).
- The course must be related to the student's program of study. Students must submit a copy of the course syllabus if possible.
- The semester hours of the non-law school course will be counted in the student's total number for the semester.
- The grade must be B or higher.
- The transfer coursework is not online, extension or correspondence credit.

Normally, the Director of the LL.M. Program must approve the course in advance of the student's work. In unusual situations, the Director of the LL.M. Program may approve application of credits earned within four (4) years prior to initial enrollment in the LL.M. Program if the credits were for work closely related to the student's work in the LL.M. Program and were taken for graduate credit. Credits will not be applied from the student's J.D. degree program or equivalent. A written request must be submitted to the Director of the LL.M. Program and include the following:

- (a) Institution, course name, number, and instructor;
- (b) Description how the course relates to the student's program of study.

## UM Course Work Required

MU requires that 30 of a student's last 36 credits must be MU course work. Mizzou Online-Self Paced courses authored by MU faculty are acceptable as are courses offered for credit through Mizzou Online. (NOTE: This policy has replaced the requirement for courses to be taken "in residence.")

## Visiting Graduate Student Program

Effective Fall 2011, the UM Visiting Graduate Student Program replaces the UM Traveling Scholars Program. The UM Visiting Graduate Student Program offers eligible graduate students a streamlined process for applying and registering for graduate courses on other UM campuses. To participate in the UM System Visiting Graduate Student Program, a graduate student must be a degree-seeking graduate student and in good-standing on the **home** campus and **host** campus.

To apply for this program, a "UM System Visiting Graduate Student Application (<http://gradschool.missouri.edu/forms-downloads/repository/um-system-visiting-graduate-student-application.pdf>)" should be completed and submitted to the **home** campus Graduate office for certification, at least two weeks before the beginning of the semester. The graduate student's **home** campus Graduate office will review the form; if approved, the **home** campus Graduate office will transmit the approved form to the **host** campus Graduate office. The **host** campus will notify the student when they are eligible to register for courses.

All course fees are paid to the **host** campus. Graduate students should contact their **home** campus Financial Aid office for more information on financial aid.

International (non-U.S. citizen) students should consult the International student office on their **home** campus to determine eligibility for this program.

Important Points:

- No application fee is required for this program.
- The **home** campus determines maximum enrollment requirements and the transferability of courses taken at other UM campuses. At MU, all courses taken in UM Visiting Graduate Student Program will be considered "transfer courses" and are subject to MU's graduate course transfer policies.
- Visiting UM Graduate Students are subject all **host** campus registration requirements and restrictions.
- To officially transfer courses from the host campus to the **home** campus, students must order an official transcript from the **host** campus and comply with the home campus's transfer policies and processes.

## Withdrawing from a Course

If a student wishes to drop a course after the last day to drop a course without a grade, the process is referred to as "withdrawing" from a course. To withdraw from a course, students must begin in their academic advising unit. Following the approval from the academic advising unit, the student takes the form for processing to the Office of the University Registrar, 125 Jesse Hall. See Academic Policies: Grades (p. 672) for more information on withdrawing from a course

**NOTE: Students may not withdraw from all courses or their last course via myZou after the tenth day prior to the start of the semester or term. This must be done in the academic advising unit.**

## **Withdrawal from the University**

### **From the Term**

A student who wishes to withdraw from the Term (University) must process the appropriate Term Withdraw Form (<http://registrar.missouri.edu/policies/withdrawal-university.php>) (PDF). Dropping all classes is considered a withdrawal from the Term (University) and must be initiated in the students academic school or college and completed prior to the last day the class meets, by the last day to withdraw from the term or prior to completing the final in a self-paced course.

Withdrawal forms will normally be dated according to the date the request was first received with the following exception: When health or other critical circumstances constitute the reason for withdrawal, the dean may designate an earlier date to which academic rules will apply.

### **Withdrawal from the University (L)**

Formal withdrawal from MU is arranged through the Graduate School using a Notice of Withdrawal form that is signed by the Director of the LL.M. Program and the Dean of the Graduate School. If the student is making a C or better at withdrawal time, a grade of W is recorded. If the student is doing failing work at withdrawal time, a grade of F is recorded. Students are responsible for notifying their instructors of their intention to withdraw and for determining if their work qualifies for a W grade. Students who leave MU without filing a statement of formal withdrawal are given a grade of F in all courses. If the reason is so urgent that an official withdrawal cannot be obtained, the student should notify the LL.M. Program as soon as possible and officially request to be withdrawn.



# Course Numbering

Course	Number	Description
Basic skills courses	0000-0999	Courses that do not count toward degree requirements- primarily used for skill development.
Freshmen-level courses	1000-1999	Entry-level courses that have only skill development courses for course prerequisites. (Test scores, etc. are acceptable prerequisites.) Considered lower-division. Community college courses will be considered equivalent to this level.
Sophomore-level courses	2000-2999	Intended primarily for second-year or sophomore students who have the essential prerequisites or background. Considered lower-division. Community College courses will be considered equivalent to this level as well.
Junior/Senior-level courses (Upper Division)	3000-3999	Upper-division courses that may NOT be listed as cross level with 5000-8999. Intended primarily for third and fourth-year (juniors and seniors) students who have the essential prerequisites or background. Often restricted to students admitted to junior-level entry degree programs.
Junior/Senior-level courses (Upper Division)	4000-4999	Upper-division courses that may be listed as cross level with 5000-7999. Intended primarily for juniors and seniors. Note special sub-ranges for capstone, research and departmental honors courses.

Undergraduate Research courses	4950-4959	Upper-division, undergraduate research courses
Capstone courses	4970-4990	
Capstone/Honor courses	4991	Courses that are both capstone and departmental honors courses
Capstone/Reading courses	4992	
Capstone/Internship courses	4993	
Capstone/Research courses	4994	
Extended Research & Departmental Honors course	4995	Multiple term duration courses based on research
Departmental Honors courses	4996-4999	Used only for departmental honors courses. Include Dept. Honors in title or course description. No "H" is listed after the catalog number.
Professional-level courses	5000-6999	Professional-level courses for Law, Vet. Med and Medicine. Generally, not for undergraduate credit. May be listed as cross-level with 4000- 4999 courses.
Beginning Graduate courses	7000-7999	Graduate-level courses for beginning and mid-level graduate students primarily. Generally not for undergraduate credit, but may be listed as cross-level with 4000-4999 courses.
Mid-level Graduate courses	8000-8999	Graduate-level courses intended primarily for mid-and upper-level graduate students. Not for undergraduate credit. May not be listed as cross-level with 4000-4999 courses.
Upper-level Graduate courses	9000-9999	Graduate-level courses intended primarily for upper-level graduate students. Not for undergraduate credit. May not be listed as cross-level with 4000-4999 courses.

"H" after a number indicates that it is an Honors course, approved by the Honors College for use toward Honors Certificate or University Honors. Not applicable to courses only designated for departmental honors.

## Undergraduate Topics Courses

Final two digits represent the distribution category within the University requirements.

Distribution Category	Description
01	General
02	Biological/physical/mathematical sciences
03	Behavioral sciences
04	Social sciences
05	Humanities

## Guidelines for Cross-Listed and Cross-Level Courses \*

\* Approved by Faculty Council February 13, 2003

Per the faculty approved policies, only 4000 and 7000 level courses may be cross-level listed. Courses that are cross-listed should be from different departments, but cover the same content, with matching course descriptions.

### Cross-Listed Courses *must*:

- Be at the same level
- Cover the same content

### Cross-Listed Courses *may*:

- Meet different general education requirements (i.e. social science for one and humanities for another)
- Not have the exact same number, but it is preferred that they do
- Have different additional fees. However, students may need to enroll in a specific course to meet a requirement and may or may not be allowed to substitute the cross-listed course to avoid the fee. There are limits on enrollment and space may not be available in the non-fee course or section.
- Exceptions: Fine art and music "skills" classes such as painting or drawing may have different levels meeting in the same room at the same time, such as 1000, 2000, etc. with the instructor requiring the appropriate additional quality and/or quantity of work for the respective level.

### Cross-Level Courses:

- Only 4000 and 7000-level courses may be cross-level listed.
- The 7000-level course must require work appropriate for graduate credit and be approved as such by the Graduate Faculty Senate.

Courses that are not cross-level may not meet in the same room at the same time or near each other are the same time so that they attempt to "get around" this rule.

# Curriculum Designator Abbreviations

The abbreviations listed below are used in course descriptions. They may be called Curriculum Designators.

Designator	Subject Area	Academic Unit
ACCTCY	Accountancy	BUS
AERO	Aerospace Studies	A&S
AFNR	Agriculture, Food and Natural Resources	CAFNR
AG_EC	Agricultural Economics	CAFNR
AG_ED	Agricultural Education	CAFNR
AG_S_M	Agricultural Systems Management	CAFNR
ANESTH	Anesthesiology	MED
AN_SCI	Animal Science	CAFNR
ANTHRO	Anthropology	A&S
ARABIC	Arabic	A&S
ARCHST	Architectural Studies	HES
ART_CERM	Art-Ceramics	A&S
ART_DRAW	Art-Drawing	A&S
ART_FIBR	Art-Fibers	A&S
ART_GNRL	Art-General	A&S
ART_GRDN	Art-Graphic Design	A&S
ART_PHOT	Art-Photography	A&S
ART_PNT	Art-Painting	A&S
ART_PRNT	Art-Printmaking	A&S
ART_SCUL	Art-Sculpture	A&S
AR_H_A	Art History and Archaeology	A&S
ASTRON	Astronomy	A&S
ATHTRN	Athletic Training	HP
ATM_SC	(Atmospheric Science) Soil, Environmental and Atmospheric Sciences	NAT R
BIOCHM	Biochemistry	CAFNR
BIOL_EN	Biological Engineering	CAFNR
BIO_SC	Biological Sciences	A&S
BIOMED	Biomedical Sciences	VET M
BL_STU	Black Studies	PRVST
BUS_AD	Business Administration	BUS
CPD	Cardiopulmonary and Diagnostic Sciences	HP
CH_ENG	Chemical Engineering	ENGR
CHEM	Chemistry	A&S
CH_HTH	Child Health	MED
CHINSE	Chinese	A&S
CV_ENG	Civil Engineering	ENGR
CL_HUM	Classical Humanities	A&S

CLASS	Classics	A&S
CL_L_S	Clinical Laboratory Sciences	HP
COMMUN	Communication	A&S
C_S_D	Communication Sciences and Disorders Program	HP
CMP_SC	Computer Science	ENGR
DERM	Dermatology	MED
DMU	Diagnostic Medical Ultrasound	HP
ECONOM	Economics	A&S
EDUC_H	Education Honors	EDUC
ED_LPA	Educational Leadership and Policy Analysis	EDUC
ESC_PS	Educational, School and Counseling Psychology	EDUC
ECE	Electrical and Computer Engineering	ENGR
EMR_ME	Emergency Medicine	MED
ENGINR	Engineering	ENGR
ENGLSH	English	A&S
ELSP	English Language Support Program	ELSP
ENV_SC	Environmental Science	NAT R
ENV_ST	Environmental Studies	PRVST
F_C_MD	Family and Community Medicine	MED
FILM_S	Film Studies	A&S
FINANC	Finance	BUS
FINPLN	Personal Financial Planning	HES
F_W	Fisheries and Wildlife	NAT R
F_S	Food Science	CAFNR
FOREST	Forestry	NAT R
FRENCH	French	A&S
GN_HES	General Human Environmental Sciences	HES
G_STDY	General Studies	A&S
GEOG	Geography	A&S
GEOL	Geological Sciences	A&S
GERMAN	German	A&S
GRAD	Graduate School	GRAD
GREEK	Greek	A&S
HMI	Health Management and Informatics	MED
HTH_PR	Health Professions	HP
HLTHPSYC	Health Psychology	HP
HLTH_SCI	Health Sciences	HP
HEBREW	Hebrew	A&S
HIST	History	A&S

GN_HON	Honors General	PRVST	MUSIC_NM	Music-Courses for Non- Majors	A&S
HSP_MGMT	Hospitality Management	CAFNR	NAT_R	Natural Resources	NAT R
H_D_FS	Human Development and Family Studies	HES	NAVY	Naval Science	ENGR
IMSE	Industrial and Manufacturing Systems Engineering	ENGR	NEUROL	Neurology	MED
IS_LT	Information Science and Learning Technology	EDUC	NEUROSCI	Integrative Neuroscience	A&S
INFOINST	MU Informatics Institute	MED	NU_ENG	Nuclear Engineering	GRAD
INFOTC	Information Technology	ENGR	NUCMED	Nuclear Medicine	HP
INTDSC	Interdisciplinary Studies	A&S	NURSE	Nursing	NURS
IN_MED	Internal Medicine	MED	NUTRIT	Nutrition	CAFNR
INTL_S	International Studies	A&S	NUTR_S	Nutritional Sciences	H E S
ITAL	Italian	A&S	OB_GYN	Obstetrics – Gynecology	MED
JAPNSE	Japanese	A&S	OC_THR	Occupational Therapy	HP
JOURN	Journalism	JOURN	OPHTH	Ophthalmology	MED
KOREAN	Korean	A&S	P_R_TR	Parks, Recreation and Tourism	NAT R
LAB_ST	Labor Studies	A&S	PTH_AS	Pathology and Anatomical Sciences	MED
LAB_AN	Laboratory Animal Medicine	VET M	PEA_ST	Peace Studies	A&S
LATIN	Latin	A&S	PHIL	Philosophy	A&S
LAW	Law	LAW	PM_REH	Physical Medicine and Rehabilitation	MED
LINGST	Linguistics	A&S	PH_THR	Physical Therapy	HP
LTC	Learning, Teaching & Curriculum	EDUC	PHYSCS	Physics	A&S
LTC_V	Learning, Teaching & Curriculum - Vocational	EDUC	PLNT_S	Plant Science	CAFNR
MANGMT	Management	BUS	POL_SC	Political Science	A&S
MRKTNG	Marketing	BUS	PORT	Portuguese	A&S
MATH	Mathematics	A&S	PSCHTY	Psychiatry	MED
MAE	Mechanical and Aerospace Engineering	ENGR	PSYCH	Psychology	A&S
MPP	Medical Pharmacology and Physiology	MED	PUB_AF	Public Affairs	GRAD
MED_ID	Medicine – Interdisciplinary	MED	P_HLTH	Public Health	GRAD
MIL_SC	Military Science	A&S	RA_SCI	Radiological Sciences	HP
MICROB	Molecular Microbiology and Immunology	MED	RADIOL	Radiology	MED
MUS_APMS	Music-Applied Music	A&S	REL_ST	Religious Studies	A&S
MUS_ENS	Music-Ensemble Courses	A&S	RS_THR	Respiratory Therapy	HP
MUS_GENL	Music-General	A&S	RM_LAN	Romance Languages and Literatures	A&S
MUS_H_LI	Music-Music History and Literature	A&S	RU_SOC	Rural Sociology	CAFNR
MUS_I_VR	Music-Instrumental and Vocal Repertory	A&S	RUSS	Russian	A&S
MUS_I_VT	Music-Instrumental and Vocal Techniques	A&S	SCI_AG_J	Science and Agricultural Journalism	CAFNR
MUS_THRY	Music-Music Theory	A&S	SOC_WK	Social Work	HES
			SOCIOL	Sociology	A&S
			SOIL	Soil Science	NAT R
			S_A_ST	South Asia Studies	A&S
			SPAN	Spanish	A&S
			SPC_ED	Special Education	EDUC
			STAT	Statistics	A&S
			SSC	Student Success Center	PRVST

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SURGRY	Surgery	MED
T_A_M	Textile and Apparel Management	HES
THEATR	Theatre	A&S
V_BSCI	Veterinary Biomedical Science	VET M
VMED_I	Veterinary Medicine - Interdisciplinary	VET M
V_M_S	Veterinary Medicine and Surgery	VET M
V_PBIO	Veterinary Pathobiology	VET M
WGST	Women's and Gender Studies	PRVST

# University Terms Defined

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Below are definitions of the academic terms used throughout the catalog. Additional policy information can be found in the catalog and in the *Faculty Handbook* (<http://facultycouncil.missouri.edu/handbook>).

**Academic Action:** Students who do not meet requirements for University academic standing requirements are subject to academic action, such as being placed on probation or being declared ineligible to enroll, which is often called dismissal. NOTE: Academic units may have more restrictive standards. (Also refer to Academic Standing and Satisfactory Progress for additional policy information.)

**Academic Plan:** A primary field of specialized study also referred to as a degree program or major.

**Academic Program:** The academic organization to which a student applies, is admitted, and ultimately graduates. These will, in most cases, correspond to schools and colleges.

**Academic Progress for Financial Aid:** Students who have attempted at least 60 credits will not be making satisfactory progress for financial aid purposes if their cumulative GPA is less than 1.67.

**Academic Standing:** For further information see, Academic Policies: Academic Standing.

**Academic Sub-plan:** An emphasis area or concentration within a specific academic plan.

**Academic Unit:** Colleges and schools are approved to offer degree programs or oversee degree or non-degree programs approved by the state Coordinating Board of Higher Education. Because the organization of these units varies across the campus, these entities are referred to as academic units, or AUs for short.

**Add/Drop:** The process for changing/dropping class; may require an advisor's approval.

**Applied Course:** A course that is focused on the personal practice of the subject matter. Applied courses are typically found in music, art, and courses preparing for certain vocations.

**Audit:** A method of taking a course in which student receives no grade or credit. Sometimes referred to as Hearer. See Academic Policies: Auditing a Course (Hearer (p. 661)).

**Basic Skills Courses:** Courses for which credit does not apply to the degree to be earned. These courses may be considered remedial or preparatory for course work that follows. These courses are numbered lower than 1000.

**Capstone Experience:** An academic activity that integrates general knowledge with the specialized knowledge each student has developed in the major area and, when appropriate, the related field.

**Certificate:** A program of study that requires completion of a minimum of 12 credits. It is part of a degree program or may be completed in addition to a degree program. Officially approved Certificates are listed on transcripts.

**Class Number:** A 5-digit unique identifier for each class, for each term.

**Commencement:** In May and December, each MU school and college holds commencement ceremonies for graduates, during which students walk across the stage and are recognized individually. Ceremonies are

not held for summer session graduates; however, these students are invited to participate in May or December commencements.

**Concurrent Courses:** Two or more courses that must be taken in the same term. They may or may not have inter-dependent information. Exceptions may be made with permissions.

**Consent Required:** Courses that require the permission of the instructor, department or division.

**Co-requisite:** A course or requirement that must be met prior to or concurrent with enrolling in a course. Exceptions may be made with permissions.

**Core Requirements:** The basic, required courses or standards that students must meet for a given major, degree, minor, emphasis or concentration.

**Course Components:** A portion or part, (i.e. subset) of a course.

- **Lecture/Standard:** Faculty delivered instruction to multiple students often in, but not always, a classroom setting. A lecture or standard class is the primary portion of the course that is often delivered face to face, but does not have to be. It may be presented on-line or via other delivery methods. While it is usually presented in a small or large group setting led by a faculty member the course might also be very interactive and include group activities. It may be offered in a traditional lecture format, a seminar format, sections with group interaction, etc.
- **Discussion:** A small group that meets to discuss topics introduced in a related lecture to supplement the instruction and allow for discussion.
- **Lab:** A class or the "practice" portion of a course in which experimentation, class projects or other exercises or skills conjunction with material presented, are performed.
- **Individual Study:** One-on-one instruction allowing for greater individualized learning and self direction. Individual study may be directed studies that are based upon an agreed upon topic between instructor and student. Titles may include but are not limited to research, problems and readings.
- **Lesson:** Typically a musical or other performance art instruction delivered one-on-one or in a small group.
- **Studio:** Hands-on, interactive, project-oriented instruction that is delivered one-on-one or in a small group. May apply to art, architectural studies, textile and apparel management, broadcast media, film creation, and communication instruction.
- **Exam-only:** Graduate student enrollment required to complete the final, comprehensive examination.
- **Internship/Externship:** Provides opportunity for students to gain experience in their field outside the classroom. Instruction is hands-on, experimental learning that may require additional research and written assignments. Titles may include, but are not limited to, preceptorships, clinical, practicums.
- **Field Study:** Off-campus, hands-on instruction directed by a faculty member with one or more students. Typically part of science and social science, as well as some humanities instruction.

**Course Attribute:** Characteristic of the instructional delivery or related aspects of a course, such as "BlackBoard", Honors, Writing Intensive, A-F grading, Study Abroad, Mizzou Online, etc.

**Credit by Exam:** Credit earned by passing advanced-standing examinations in a subject-matter field. Examinations can include:

departmental exams, CLEP subject-matter exams and International Baccalaureate and Advance Placement exams given by the College Entrance Examination Board of Princeton, N.J. See Academic Policies: Advanced Standing - Credit By Exam. (p. 660)

**Credit:** One credit represents approximately three hours of a student's time each week for one semester. This may mean one hour in lecture or standard classroom instruction, in addition to two hours spent in preparation. (Also referred to as Units.)

**Cross-level Course:** A cross-level course is a course offered at both the undergraduate and the graduate level. Undergraduate students enroll in a course numbered in the 4000 range and graduate students enroll in a course numbered in the 7000 range. Lectures and discussions may be held jointly, but different graduate level work will be required of students in the 7000-level courses. (They are also referred to as combined sections.)

**Cross-listed Course:** A course that is considered the same as, and often may meet with a section of, another course with a different curricular abbreviation and possibly a different course number. (They are also referred to as combined sections.)

**Curriculum:** An organized program of study arranged to provide integrated cultural or professional education.

**Curriculum Designator (Subject Area):** A specific area of instruction within an academic organization. These are the subject matter headings that appear in the Course Catalog and the Schedule of Classes.

**Degree Audit Report:** MU uses a degree audit system called DARS for short, which tracks degree programs. Many academic units and departments use these reports to assist in advising students. Students may look at their own DARS reports using myZou.

**Dean's Signature:** The dean's signature is the mark of approval for certain academic actions, such as approvals to withdraw at certain points in the term. Usually a "dean's signature" refers to a stamped signature from the academic advising office within the academic unit. A dean's signature may also be the signature of the dean or associate dean of the college or school. When instructions indicate that a student should obtain a dean's signature for approval of a process, students should first inquire in the academic advising office for their degree program.

**Degree:** A formal award or title conferred upon an individual for the completion of a program or courses of study.

**Degree Component:** A portion or part, (i.e. subset) of a degree requirement.

**Degree Program:** A primary field of specialized study also referred to as a major or academic plan.

**Discipline:** A branch of learning or field of study (e.g., mathematics, history or psychology).

**Dual Degree:** The completion of two degrees simultaneously. All requirements for both degrees must be met and at least 12 credits beyond the first degree must be successfully completed for the second. See Faculty Handbook (<http://facultyouncil.missouri.edu/handbook/article-9.html>).

**Emphasis Area:** A subarea of specialized study within a major that has been formally approved. Emphasis areas are printed on students' transcripts.

**Enrollment Dates:** A specific time period in which registration is allowed for a specific upcoming term in myZou. Time period is narrowed by a specific date and time.

**Enrollment Requirement:** A condition the student must satisfy prior to enrolling in a course. (i.e., "Sophomore Standing, ENGLSH 1000.") (Also referred to as requisites or prerequisites.)

**General Education (University):** The MU Faculty has developed a comprehensive program of University general education course work that equips students with the skills, knowledge and foundations in the disciplines required of all informed citizens. All MU students must satisfy University general education requirements as a part of their undergraduate degrees. See General Education Requirements. (p. 18)

**GPA of Record:** The GPA stands for grade point average. A GPA of record is the official GPA. See Academic Policies: Grades. (p. 672)

**Graded Course:** A course in which credit is awarded if successfully completed. A course in which a student has enrolled as a "Hearer/Auditor" is not regarded as a graded course for that student.

**Grading Basis:** The grading system used to assign a grade. See Academic Policies: Grades (p. 672).

**Graduation:** The act of having the degree(s) conferred.

**Honors Course-Departmental:** See Academics at MU: Course Numbering section (p. 689). Catalog number is not followed by an "H".

**Honors Course-General:** A course limited to honors-eligible students. Course has been approved by Honors college for use towards Honors Certificate or University Honors. Catalog number is followed by an "H".

**Honors Eligibility:** See Undergraduate/Graduate: Honors College (p. 641) for more information.

**Instructional Mode:** The dominant delivery method of instruction of the class content.

- **Traditional:** No online technology used -- content is delivered in writing or orally. May have a video of the class that is used during the initial delivery and viewed later. Course attributes should indicate this.
- **Web Facilitated:** Includes face-to-face instruction. Includes those courses in which zero to 29 percent of the content is delivered online. May have a video of the class that is used during the initial delivery and viewed later. Course attributes should indicate this.
- **Blended class instruction:** Defined as having between 30 percent and 80 percent of the course content delivered online. It is sometimes called hybrid.
- **On-line:** A course where most or all (80% or greater) of the content is delivered online. Typically these sections have no face-to-face meeting, but there may be some or face-to-face exams, etc.
- **E-Learning (EL):** A course where 100% of the content is delivered online. (May have proctored exams)

**Interdisciplinary or Multidisciplinary:** A course of study that combines two or more academic disciplines.

**Location:** An indication of where a student is taking a course for billing and informational purposes.

**Lower Division:** Undergraduate courses numbered less than 3000.

**Major:** A primary field of specialized study also referred to as a degree program or academic plan.

**Minor:** A secondary field of specialized study.

**Mizzou Online:** Mizzou Online partners with academic units to develop, market, and deliver programs and courses designed for distance students.

**Mizzou Online-Self Paced:** Students may enroll in self-paced, online courses year-round, (minimum six weeks, maximum nine months) and complete coursework at their own pace. Students with 60 or more approved credit hours may complete a bachelor of general studies degree online.

**Mizzou Online-Semester Based:** Semester-based courses have specific start and end dates and follow the University semester calendar. Students participate with other students and instructors in the courses and have assignment due dates and deadlines. Enrollment periods are the same as campus sections.

**myZou:** MU's online student information system.

**Option:** A track or other portion of a major that may be required or optional. A separate designation is not made on the transcript or diploma for an option or track.

**Prerequisite:** A course or requirement that must be met prior to enrolling in a course. Exceptions may be made with permissions.

**Readmission:** See Admissions Office (<http://admissions.missouri.edu/apply/re-admission>) for information on the readmission process and standards.

**Recommended course:** A course that is beneficial or preferred for the student to have taken before enrolling in a subsequent course. It is a strong suggestion, but not a requirement.

**Registration:** The act of enrolling in classes for a given semester or term. At the University of Missouri, registration refers to the process in which students select course work for a term and, reserve spaces (enroll) in the courses in the University's computer system. This may be done through myZou.

**Repeat for Credit:** Courses that may be taken more than once for credit (e.g., music performance courses.)

**Requirement:** A course, activity or accomplishment that must be completed successfully.

**Satisfactory Progress:** The time progression in meeting the requirements of the student's established educational objective, typically, the completion of a degree program. Satisfactory progress is based on two concepts:

- Minimum number of credits completed expressed as a percentage of total credits attempted
- Maximum time to complete the degree as expressed by a total number of credits attempted

The term may also refer to financial aid requirements. See *Financial Aid* (<http://financialaid.missouri.edu>).

**Second, Undergraduate Degree:** A second undergraduate degree a student pursues after earning one degree.

**Section:** Multiple sections of the same course will be identified by different class numbers.

**Sequence of Courses:** Two or three closely related courses that must be taken in specified order.

**Service Indicators/Holds:** An indication to the student that enrollment actions may be restricted from the student. Clicking on the details of

the indicator will tell the student what the restriction may be and who to contact regarding the restriction. (i.e. financial holds, probation, etc.)

**Session:** A class scheduling/enrollment control time period within an academic term.

**Student Center:** The page in myZou where a student can view a synopsis of all their information. (i.e. schedule, service indicators, enrollment dates, financial information.)

**Student Level:** Students are assigned to a particular class level based upon the number of credits they have completed. (i.e. freshmen, sophomore, junior and senior.) See Academic Policies: Student Level (p. 683).

**To-Do List:** A place in the Student Center that administrative or academic departments may place a list of things a student still must complete. (i.e. Admissions, Financial Aid)

**Track:** An option or other portion of a major that may be required or optional. A separate designation is not made on the transcript or diploma for an option or track.

**Upper Division:** Undergraduate courses numbered 3000-4000.

**Variable Credit(Units):** For some courses, the student may choose the number of credits.

**Waive:** To set aside without credit certain requirements for a degree.



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## Accountancy (ACCTCY)

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### **ACCTCY 2010. Introduction to Accounting. 3 Credits.**

Introduction to accounting for non-business majors. Emphasis on introducing students to business operations, as well as preparing and using management information and financial accounting information for business decisions (does not count as either Accountancy [ACCTCY] 2036 or 2037).

### **ACCTCY 2026. Accounting I. 3 Credits.**

An introduction to the field of accounting, this course covers the fundamentals of financial accounting. Business students at UMC must have advisor's approval. Credit may not be earned for both Accountancy [ACCTCY] 2026 and 2036. Course only offered through the Mizzou Online (self paced).

### **ACCTCY 2027. Accounting II. 3 Credits.**

This course covers the fundamentals of managerial accounting and additional topics in financial accounting. Business students at UMC must have advisor's approval. Credit may not be earned for both Accountancy [ACCTCY] 2027 and 2037. Prerequisite: Accountancy [ACCTCY] 2026. Course only offered through Mizzou Online (self paced).

### **ACCTCY 2036. Accounting I. 3 Credits.**

First half of two-part course focusing on the business environment and the use of managerial and financial accounting information for decision making in various business settings. Emphasizes the use of accounting information about a retail company (sole proprietorship) by internal and external users, followed by an introduction to other forms of business and, then, planning for corporate operations. Prerequisite: sophomore standing.

### **ACCTCY 2037. Accounting II. 3 Credits.**

Second half of two-part course focusing on the business environment and the use of managerial and financial accounting information for decision making in various business settings. This half emphasizes the use of accounting information about a manufacturing company (corporation) by internal and external users. Prerequisite: Accountancy [ACCTCY] 2036 or 2136H.

### **ACCTCY 2136H. Honors Accounting I. 3 Credits.**

First part of two-part course focusing on the nature and use of managerial and financial accounting information for decision making in various business settings. Emphasizes use of accounting information by internal and external users. Prerequisite: sophomore standing in Accounting or Business, 3.3 or higher GPA. Honors eligibility required.

### **ACCTCY 2137H. Honors Accounting II. 3 Credits.**

Continuation of Accountancy [ACCTCY] 2136H. Prerequisite: C or better Accountancy [ACCTCY] 2136H. Honors eligibility required.

### **ACCTCY 2258. Computer-Based Data Systems. 3 Credits.**

Introduces the computer as a tool in the efficient operation of a business. Skills developed in the course include electronic information retrieval, information analysis using a spreadsheet, what-if analysis macro development, and information presentation. In addition, computer components, data storage, networks, and information technology are discussed. Prerequisite: Accountancy [ACCTCY] 2036 or 2136H.

### **ACCTCY 3326. Financial Accounting Theory and Practice I. 3 Credits.**

Institutional structure, conceptual framework, and reporting standards and practices of financial accounting, with special emphasis on

accounting for assets. Prerequisite: Accountancy [ACCTCY] 2037 or 2137H.

### **ACCTCY 3328. Accounting Information Systems. 3 Credits.**

Introduction to accounting information systems (AIS). General AIS concepts. Transaction processing systems and accounting cycles. Alternative platforms for computerized transaction processing. Database management and data modeling. Control concepts and design. Prerequisite: Accountancy [ACCTCY] 2258.

### **ACCTCY 3346. Financial Accounting Theory and Practice II. 3 Credits.**

Continuation of Accountancy [ACCTCY] 3326, with special emphasis on income recognition and accounting for liabilities and ownership equity. Prerequisite: Accountancy [ACCTCY] 3326.

### **ACCTCY 3347. Cost and Managerial Accounting. 3 Credits.**

Activity based and traditional job order and process cost systems for service, merchandising, and multinational manufacturing companies; Cost accounting techniques and procedures for financial reporting by multinational companies. Strategic focus to management accounting measurement and reporting. Standard costs and variances, capital budgeting. Prerequisites: Accountancy [ACCTCY] 2037 or 2137H and 2258.

### **ACCTCY 4000. Accountancy Professional Speakers and Symposia. 0 Credits.**

This non-credit course, recommended for all accountancy majors, will provide exposure to issues in the accounting profession through professional speaker series and symposia. Components will include the Dawdy Speaker Series, Orin Ethics Symposium, and Symposia delivered by accounting firms and/or professional accounting organizations. Prerequisites: Accountancy [ACCTCY] 2036, 2037, and 2258; Accountancy Majors. This will be a non-credit, non-billed, no hours course.

### **ACCTCY 4301. Topics in Accounting. 1-3 Credit.**

Independent investigations, reports on approved topics. Prerequisites: instructor's consent.

### **ACCTCY 4353. Introduction to Taxation. 3 Credits.**

Introduction to the structure and conceptual foundation of the U.S. federal income tax system for individual taxpayers. Topics include income recognition, deductions, property transactions, trusts, and family wealth planning. This course also introduces students to legal tax research and preparation of individual income tax returns. Prerequisite: Accountancy [ACCTCY] 2037 or 2137H. Restricted to TCoB professional program students only.

### **ACCTCY 4356. Financial Accounting Concepts. 3 Credits.**

Current issues in the financial reporting of business corporations to external parties. Not open to accountancy majors. Prerequisite: Accountancy [ACCTCY] 2037 or 2137H.

### **ACCTCY 4365. Governmental Accounting and Budgeting. 3 Credits.**

Introduction to government and not-for-profit accounting. Concepts and principles of fund accounting, budgeting, auditing, and financial reporting in government and not-for-profit entities. Prerequisite: Accountancy [ACCTCY] 3326.

### **ACCTCY 4373. Taxation of Business Entities. 3 Credits.**

The course focuses on federal tax laws related to various business entities which include (C Corporations, Partnerships and S Corporations) and their owners. We will follow the life cycle of these business entities and discuss the tax issues involved with the formation, operation,

distribution to owners, liquidations, and sales of interest to other owners of each type of business entity. Graded on A-F only. Prerequisites: ACCTCY 4353 or ACCTCY 7353.

**ACCTCY 4384. Auditing Theory and Practice I. 3 Credits.**

Introduction to the auditing profession, assurance function, and generally accepted standards for conducting audits. Prerequisites: Accountancy [ACCTCY] 3328 and 3346.

**ACCTCY 4940. Professional Accounting Internship. 3-6 Credit.**

Provides full-time professional accounting work experience of at least eight weeks duration. Completion of first 105 hours of 150-hour accountancy curriculum (or equivalent) and consent of Internship Coordinator. Graded on S/U basis only.

**ACCTCY 7000. Accountancy Professional Speakers and Symposia. 0 Credits.**

This non-credit course, recommended for all accountancy majors, will provide exposure to issues in the accounting profession through professional speaker series and symposia. Components will include the Dawdy Speaker Series, Orin Ethics Symposium, and Symposia delivered by accounting firms and/or professional accounting organizations. Prerequisites: Accountancy [ACCTCY] 2036, 2037, and 2258; Accountancy Majors. This will be a non-credit, non-billed, no hours course. Graded on S/U basis only.

**ACCTCY 7310. Accounting for Managers. 3 Credits.**

Introduction to understanding how accounting information is used to help make informed decisions in various business settings. Includes an introduction to basic financial and management accounting concepts and procedures. Prerequisites: MBA or MSPA candidate, or departmental consent.

**ACCTCY 7353. Introduction to Taxation. 3 Credits.**

Introduction to the structure and conceptual foundation of the U.S. federal income tax system for individual taxpayers. Topics include income recognition, deductions, property transactions, trusts, and family wealth planning. This course also introduces students to legal tax research and preparation of individual income tax returns. Prerequisites: Accountancy [ACCTCY] 2037 or 2137H.

**ACCTCY 7356. Financial Accounting Concepts. 3 Credits.**

Current issues in the financial reporting of business corporations to external parties. Not open to accountancy majors. Prerequisite: Accountancy [ACCTCY] 2037 or 2137H or 7310.

**ACCTCY 7365. Governmental Accounting and Budgeting. 3 Credits.**

Introduction to government and not-for-profit accounting. Concepts and principles of fund accounting, budgeting, auditing, and financial reporting in government and not-for-profit entities. Prerequisite: graduate standing and Accountancy [ACCTCY] 3326.

**ACCTCY 7384. Auditing Theory and Practice I. 3 Credits.**

Introduction to the auditing profession, assurance function, and generally accepted standards for conducting audits. Prerequisites: graduate standing and Accountancy [ACCTCY] 3328 and 3346.

**ACCTCY 7940. Professional Accounting Internship. 3-6 Credit.**

Provides full-time professional accounting work experience of at least eight weeks duration. Completion of undergraduate portion of 150 hour program (or equivalent) and consent of Internship Coordinator. Graded on S/U basis only. Prerequisite: graduate standing.

**ACCTCY 8358. Systems Analysis and Design. 3 Credits.**

Modern information systems analysis and design, focusing on business process modeling. Prerequisite: Accountancy [ACCTCY] 2258. Computer Science [CMP\_SC] 1001 or 1050 also recommended.

**ACCTCY 8373. Taxation of Corporations and Shareholders. 3 Credits.**

Life cycle of a corporation including formations, operations, distributions, and liquidations of corporations. Prerequisite: graduate standing and Accountancy [ACCTCY] 4353 or 7353.

**ACCTCY 8383. Taxation of Flow-Through Entities. 3 Credits.**

This course covers formations, operations, distributions, and liquidations of partnerships and S-Corporations. Prerequisites: Accountancy [ACCTCY] 4353 or 7353. Course graded on A/F basis only. Graduate Standing required.

**ACCTCY 8393. Taxation of Trust, Gifts and Estates. 3 Credits.**

This course covers two main topics. Students are introduced to the construction, operation and income taxation of trusts. After this portion of the course students will learn about the gift tax consequences of completed exchanges. Finally, students will learn the basic rules regarding the estate tax. Prerequisites: Accountancy [ACCTCY] 4353/7353. Graded on A/F basis only.

**ACCTCY 8401. Topics in Accounting. 1-3 Credit.**

Independent investigations, reports on approved topics. Prerequisite: instructor's consent.

**ACCTCY 8404. Internal Auditing. 3 Credits.**

This course covers the concepts, practices, and application of internal audit activities. The course will review the entire internal audit process including annual audit and engagement planning, fieldwork, reporting, and management communication. Other topics including internal controls, enterprise risk management, and key behavior skills will be discussed. The Professional Practices Framework and industry best practices will be incorporated throughout the semester. This course will prepare students for entry-level internal audit positions. Graded A-F only. Prerequisites: Accountancy [ACCTCY] 4384/7384. Graduate standing required.

**ACCTCY 8408. Advanced Accounting Information Systems. 3 Credits.**

Emerging concepts and technologies in accounting information systems, with an emphasis on E-Business. Prerequisite: Accountancy [ACCTCY] 3328.

**ACCTCY 8414. Information Systems Assurance and Control. 3 Credits.**

A combination of control theory, concept application, demonstration of actual practice, and student research to develop an understanding of the concepts and practices used in the design, development or assurance of information systems (IS) controls. Prerequisites: Accountancy [ACCTCY] 3328, and 4384/7384.

**ACCTCY 8419. International Accounting. 3 Credits.**

Introduction to accounting regulations and practices outside of the U.S., accounting regulations for foreign registrants on the NYSE and NASDAQ, international accounting standards and international management control issues. Review of cultural frameworks; transfer pricing methods and international accounting standards. Prerequisites: Accountancy [ACCTCY] 3346 and 3347.

**ACCTCY 8423. Tax Research and Planning. 3 Credits.**

Applied tax research using print and electronic data bases; heuristic biases in tax judgments; responsibilities of professional tax practices.

Prerequisite: Accountancy [ACCTCY] 8373 (or concurrent enrollment in 8373).

**ACCTCY 8424. Fraud Examination. 3 Credits.**

A study of the methods and techniques of fraud examination, particularly with regard to frauds perpetrated by the company against the public. The ethical and professional standards that underlie the accountant's responsibility for fraud detection and prevention are emphasized. Prerequisite: Accountancy [ACCTCY] 4384/7384, graduate standing. Graded on A/F basis only.

**ACCTCY 8425. Accounting for Governments and Other NonProfit Entities. 3 Credits.**

Role of accounting information in planning, managing, and controlling nonbusiness organizations; reporting to external parties; concepts of governmental auditing. Prerequisites: Accountancy [ACCTCY] 4365/7365 or instructor's consent.

**ACCTCY 8428. Data Warehousing and Data Mining. 3 Credits.**

Enterprise-wide view of data and transaction processing. Concepts and techniques of data warehousing and data mining of business-critical data. Prerequisite: Accountancy [ACCTCY] 3328 or departmental consent.

**ACCTCY 8434. Applications of Auditing Concepts. 3 Credits.**

Application of auditing concepts and techniques in various phases of audit engagements. Prerequisite: Accountancy [ACCTCY] 4384.

**ACCTCY 8436. Financial Accounting Theory and Practice III. 3 Credits.**

Continuation of Accountancy [ACCTCY] 3346. Addresses a series of special financial accounting topics including income taxes, pensions, leases, business combinations, consolidated statements, and foreign currency translation. Prerequisite: Accountancy [ACCTCY] 3346.

**ACCTCY 8437. Strategic Cost Analysis. 3 Credits.**

Analysis to support organizational strategy including cost management, performance evaluation, and control of responsibility centers. Prerequisites: Accountancy [ACCTCY] 3347, Mathematics [MATH] 1320 and Statistics [STAT] 3500, or the equivalent.

**ACCTCY 8438. Forensic Accounting. 3 Credits.**

Coverage of forensic accounting processes and tools used in the detection and prevention of fraud against the company. Topics include skimming, cash larceny, check tampering, billing schemes and others. An emphasis of the course will be upon the use of computer aids. Prerequisite: Accountancy [ACCTCY] 3328, 4384/7384, graduate standing. Graded on A/F basis only.

**ACCTCY 8446. Application of Financial Accounting Pronouncements. 3 Credits.**

Development, content and application of authoritative pronouncements in financial accounting. Problems and case studies. Prerequisite: Accountancy [ACCTCY] 8436.

**ACCTCY 8448. Emerging Issues in Accounting Information Systems. 3 Credits.**

Current developments in the implementation of accounting information systems. Topics may vary. Prerequisite: Accountancy [ACCTCY] 8408.

**ACCTCY 8450. Accounting and Strategic Business Analysis. 3 Credits.**

Capstone course in the Master of Accountancy program. Emphasis on case analysis to develop critical thinking and analytical skills in the use of accounting reports for broad-based business analysis. Prerequisites: Accountancy [ACCTCY] 3346 or equivalent and graduate standing.

**ACCTCY 8453. Taxes and Business Strategies. 3 Credits.**

This class examines the role taxes in business decisions. The analysis involved considers 1) tax consequences of all parties to a transaction, 2) both explicit and implicit taxes, and 3) tax as well as non-tax costs. Prerequisites: graduate standing.

**ACCTCY 9090. Research in Accounting. 1-99 Credit.**

Each student is under direction and guidance of an accountancy professor in writing a dissertation. Periodic seminars discuss research projects. Graded on a S/U basis only. Prerequisites: doctoral candidacy and instructor's consent.

**ACCTCY 9401. Doctoral Research Problems in Accounting. 1-3 Credit.**

Independent investigations, reports on approved topics. Prerequisite: instructor's consent and director's consent. Restricted to Doctoral level students only.

**ACCTCY 9444. Seminar in Auditing Research. 3 Credits.**

The economic role of auditing; the audit process; audit reports and the consequences of auditing on financial statements; new audit directions and perspectives. Prerequisites: doctoral candidacy or instructor's consent.

**ACCTCY 9455. Seminar in Governmental and Nonprofit Accounting. 3 Credits.**

Critical review of the governmental and nonprofit accounting research literature, with emphasis on auditing issues and research methods. Prerequisite: doctoral candidacy or instructor's consent. Prerequisites: Accountancy [ACCTCY] 4384/7384 and 4365/7365.

**ACCTCY 9457. Quantitative Methods in Accounting. 3 Credits.**

Application of mathematics and statistics to managerial and financial accounting problems. Prerequisites: Accountancy [ACCTCY] 3347, Mathematics [MATH] 1300 and 1320 and Statistics [STAT] 3500, or instructor's consent.

**ACCTCY 9460. Research Methods in Accounting. 3 Credits.**

Application of research methods to the investigation of current accounting issues. A research paper is required. Prerequisite: doctoral candidacy or instructor's consent.

**ACCTCY 9466. Seminar in Financial Accounting Research. 3 Credits.**

Theory of financial accounting and regulated disclosure; empirical tests of financial accounting theory, with emphasis on the nature of the research question addressed, and the method used to address the research question. Prerequisite: doctoral candidacy or instructor's consent.

**ACCTCY 9467. Seminar in Behavioral Accounting Research. 3 Credits.**

Critical review of the Behavioral accounting research literature with emphasis on issues and research methods. Prerequisite: doctoral candidacy and instructor's consent.

**ACCTCY 9468. Seminar in Information Systems Research. 3 Credits.**

Overview of research related to advanced systems and how accounting information is processed, with emphasis on current issues and research methods. Prerequisite: doctoral candidacy or instructor's consent.

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## Aerospace Studies (AERO)

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**AERO 1100. The Foundations of the United States Air Force. 2 Credits.**

Introduces the Air Force and Air Force ROTC. Topics include professional appearance, military customs and courtesies, core values, equal opportunity and treatment, officer opportunities, group leadership problems. Applies communicative skills. Leadership lab.

**AERO 1200. The Foundations of the United States Air Force. 2 Credits.**

Continues the introduction to the Air Force and Air Force ROTC. Topics include Air Force origins, organizations, major commands, installations, sister services (Army and Navy), group leadership problems. Applies communicative skills. Leadership lab.

**AERO 2100. The Evolution of USAF Air and Space Power. 2 Credits.**

A survey course designed to facilitate the transition from Air Force ROTC cadet to Air Force ROTC officer candidate. Explores Air Force heritage, Air Force leaders and Air Power doctrine. Applies communicative skills. Leadership lab.

**AERO 2200. The Evolution of USAF Air and Space Power. 2 Credits.**

Continues the examination of air and space power from the Vietnam era through the present. Topics include the Vietnam War, the Persian Gulf War, and overseas contingency operations. Applies communicative skills. Leadership lab.

**AERO 3100. Air Force Leadership Studies. 3 Credits.**

An integrated leadership and management survey course emphasizing development of the individual as an Air Force leader. Special topics include situational leadership, principle centered leadership, corrective supervision and counseling. Leadership lab.

**AERO 3200. Air Force Leadership Studies. 3 Credits.**

Air Force leadership principles are examined from the foundation developed in AERO 3100. Ethical decision making, personal core values, and character development are discussed. Military evaluation systems are outlined. Leadership lab.

**AERO 4100. National Security Affairs/Preparation for Active Duty. 3 Credits.**

Examines the national security process, regional studies, Air Force and joint doctrine. Special topics include the military as a profession and civilian control of the military. Continued emphasis on communicative skills. Leadership lab.

**AERO 4200. National Security Affairs/Preparation for Active Duty. 3 Credits.**

Examines civilian control of the military, officership, the military justice system, and current issues affecting military professionalism. Continued refinement of communicative skills. Leadership laboratory.

## **Agricultural Economics (AG\_EC)**

**AG\_EC 1010. Introduction to Agribusiness Management. 1 Credit.**

Management concepts and techniques. Coordination of business activity, motivation, and decision-making approaches used by industry leaders in global food chain. Unique aspects of managing enterprises in the agriculture-food sector.

**AG\_EC 1011. Survey of Global Agribusiness. 1 Credit.**

Economic, social and political forces and trends and the impact on U.S. and global agribusinesses. Global production, consumption trade, and

investment patterns in agriculture-food sector. Developing management strategy in changing economic political environment.

**AG\_EC 1041. Applied Microeconomics. 3 Credits.**

Introduction to the microeconomic principles and their application to decision-making in agribusinesses. Consumer decision analysis, producer goals and optimization and the market environment where they meet and trade. Applications to current issues. Students who complete Agricultural Economics [AG\_EC] 1041 may not have credit for Economics [ECONOM] 1014.

**AG\_EC 1042. Applied Macroeconomics. 3 Credits.**

Introduction to macroeconomic principles and their application to agriculture-food sector and natural resource issues. Using macroeconomic principles in decision making and in evaluating national and regional economic problems and issues. Students who complete Agricultural Economics [AG\_EC] 1042 may not have credit for Economics [ECONOM] 1015.

**AG\_EC 2070. Environmental Economics and Policy. 3 Credits.**

(same as Environmental Studies [ENV\_ST] 2070). Examines current environmental and natural resource issues using a systems perspective and key economic concepts. Explores connections between the environment and the economy based on problems at the local, national, and international levels. Prerequisite: English [ENGLISH] 1000 and sophomore standing.

**AG\_EC 2123. Quantitative Applications in Agricultural Economics. 3 Credits.**

Familiarize students with the use of calculus and other quantitative tools in developing and analyzing fundamental economic concepts. Prerequisites: Agricultural Economics [AG\_EC] 1041 and Mathematics [MATH] 1400.

**AG\_EC 2156. Introduction to Environmental Law. 3 Credits.**

Environmental issues from a legal perspective, using current controversies from both the USA and other countries. Major environmental laws dealing with water, air, noise, endangered species, waste disposal, and land use.

**AG\_EC 2183. The Agricultural Marketing System. 3 Credits.**

Analysis of marketing systems that transforms agricultural products into food products. Examines functions and institutions in marketing and distributing food from both micro and macro perspectives. Prerequisite: AG\_EC 1041, AG\_EC 1042 and ENGLISH 1000.

**AG\_EC 2223. Agricultural Sales. 3 Credits.**

Principles of salesmanship in agricultural input and output markets; buyer motivations; time and territory management; communication models and techniques; planning and executing sales calls; after-sale service. Prerequisites: AG\_EC 1041.

**AG\_EC 2225. Statistical Analysis. 3 Credits.**

Elementary statistical inference. Prerequisite: AG\_EC 1041 and MATH 1100. Math Reasoning Proficiency Course.

**AG\_EC 2940. Practicum in Agricultural Economics. 1-3 Credit.**

Off-campus integrated working and learning experience for departmental majors and minors. Application of economic concepts in business or government. Prerequisites: 6 credit hours Agricultural Economics, 3 credits communications, and 30 total University credits. Graded on S/U basis only.

**AG\_EC 3150. International Agribusiness. 3 Credits.**

This course covers the primary factors that shape the business environment for food and agricultural firms conducting business across

borders. The course examines how culture, institutions and public policy affect business operations and business strategies. Prerequisites: AG\_EC 2183 or instructor's consent.

**AG\_EC 3224. New Products Marketing. 3 Credits.**

Learning experience to develop skills in marketing new agriculture products. To include market analysis, goals and objectives, action plan, financial evaluation and monitoring and measurement. In small groups, students will develop complete marketing plan for a new product. Prerequisites: ENGLSH 1000 and either AG\_EC 1041 or ECONOM 1014.

**AG\_EC 3230. Agricultural and Rural Economic Policy. 3 Credits.**

Study and analysis of past and present government policies affecting agriculture and rural economy. Prerequisite: AG\_EC 1041 and AG\_EC 1042 or equivalent.

**AG\_EC 3241. Ethical Issues in Agriculture. 3 Credits.**

The study of how economics, philosophy, and science inform on and impact important ethical problems in agriculture, such as the environment, biotechnology, animal welfare, farm structure, the role of agribusiness, development, sustainability, and agriculture-related public policy. Course may be repeated once for credit. Prerequisite: AG\_EC 1041 or equivalent and junior standing.

**AG\_EC 3251. Agricultural Prices. 3 Credits.**

Variations in prices of agricultural products; underlying factors. Prerequisites: AG\_EC 1041, AG\_EC 1042, AG\_EC 2123 and AG\_EC 2225 or STAT 2500.

**AG\_EC 3256. Agribusiness and Biotechnology Law. 3 Credits.**

Legal concepts applicable to agribusiness and biotech firms. To include contracts, torts, product liability, warranties, corporate farming laws, UCC, corporations/partnerships/limited liability companies, labor laws, patent copyrights/trademark laws, international and ethical perspectives. Prerequisites: 3 hours of Agricultural Economics or Economics.

**AG\_EC 3257. Rural and Agricultural Law. 3 Credits.**

Everyday practical legal problems facing rural residents, farmers, agribusiness, and local government. Laws include statutes, common law (cases), customs, and administrative regulations. Topics include corporate/contract farming, right-to-farm, leases, fence laws, estate planning and water rights. Prerequisites: 3 hours of Agricultural Economics or Economics.

**AG\_EC 3260. General Farm Management. 3 Credits.**

Economics and management principles applied to planning and operating farm businesses. Includes enterprise combination, resource acquisition, water management, profit maximizing techniques and annual adjustments to changing conditions. Prerequisite: AG\_EC 1041.

**AG\_EC 3270. Conservation and Use of Protected Areas. 3 Credits.**

Evaluation of socioeconomic, cultural and ecological values influencing the development and management of protected areas including parks, forests, wildlife refuges, wilderness and wild/scenic rivers. Prerequisites: AG\_EC 1041 or equivalent, or AG\_EC 2070 and introductory natural resources courses, or instructor's consent.

**AG\_EC 3271. International Agricultural Development. 3 Credits.**

Examines world food problem; analyzes its causes; economic and noneconomic policy alternatives for modernizing agriculture in less-developed countries. Prerequisites: AG\_EC 1041 and AG\_EC 1042 and junior standing.

**AG\_EC 3272. International Food Trade and Policy. 3 Credits.**

Examines food trade; develops economic analyses of trade impacts on domestic agricultural policies; examines international trade agreements;

and interface of trade and environment. Prerequisites: AG\_EC 1041 and AG\_EC 1042.

**AG\_EC 3282. Agribusiness Finance. 3 Credits.**

Application of the concepts and methods of finance to the management of agribusiness firms, including cooperatives. Special attention is given to the working capital needs of agribusiness and to the specialized lending institutions in the agricultural economy. Prerequisite: AG\_EC 1041 and ACCTCY 2037.

**AG\_EC 3283. Fundamentals of Entrepreneurship. 3 Credits.**

Introduce students to entrepreneurial way of thinking. Entrepreneurship is a way of thinking about identifying/creating opportunities and transforming those opportunities into new businesses, new institutions, or solutions to problems. Students will participate in the process of formulating and evaluating solutions to problems and identifying and exploiting opportunities. Prerequisites: AG\_EC 1041 and ACCTCY 2036 or equivalent.

**AG\_EC 3285. Problems in Agricultural Economics. 1-3 Credit.**

Supervised study in a specialized phase of agricultural economics. Prerequisite: AG\_EC 1041 and AG\_EC 1042; instructor's consent. Graded on S/U basis only.

**AG\_EC 3286. Economics of Managerial Decision Making. 3 Credits.**

Introduces tools and concepts from price theory, game theory, industrial organization and organizational economics, and applies them to managerial decision making activities for businesses in the agrifood system and for natural resource and environmental management. Prerequisite: AG\_EC 1041, AG\_EC 2123 and AG\_EC 2183.

**AG\_EC 3294. Agricultural Marketing and Procurement. 3 Credits.**

Content of course focuses on marketing issues in the agriculture supply chain. Topics covered include price discovery, basis, futures/options, contracting, logistics, and management decision making. Prerequisites: AG\_EC 2183 and AG\_EC 2225.

**AG\_EC 3295. Commodity Futures/Options Trading. 3 Credits.**

Familiarize students with the learning components of commodity future/option trading. Students learn through involvement by investing in a commodity pool and trading futures/options. Students apply both fundamental and technical analysis. Students taking this course are required to invest from \$100 to \$300 in \$100 increments. Prerequisites: AG\_EC 2183, AG\_EC 3294 or instructor's consent.

**AG\_EC 3321. Economic History of Agriculture. 3 Credits.**

Emphasizes Europe and U.S. historical interpretation; usefulness in evaluating present and probable future developments in agriculture. Prerequisite: AG\_EC 1041.

**AG\_EC 3383. Rural Entrepreneurship II. 3 Credits.**

Rural Entrepreneurship II is designed for students that realize they may need to create their own career or opportunity if they want to return to their rural community and for students who would like to better understand how to create that option in their career choice set. Prerequisites: AG\_EC 1041, AG\_EC 3283 and ACCTCY 2036.

**AG\_EC 4110. In-Service Course in Agricultural Economics. 2-10 Credit.**

A. Profit Maximizing Principles B. Farm Planning C. Farm Records and Analysis D. Business Management E. Using Computers in Farm Management Decision Making. Basic principles of farm management. Applications of principles and subject matter in successful classroom presentation primarily for high school teachers. Course is offered in

sections A-E as listed, for 2 hours each. Prerequisites: 10 hours credit in Agricultural Economics, including AG\_EC 3260, or instructor's consent.

**AG\_EC 4230. Understanding the Agricultural Policy Process. 3 Credits.**

The goal of this course is to prepare students for a career in agricultural policy and will build the skill set needed in the agricultural policy environment. Prerequisites: AG\_EC 3230 and instructor's consent.

**AG\_EC 4295. Agricultural Risk Management. 3 Credits.**

This class will examine the range of risks business face and explore ways of characterizing and evaluating those risks. Prerequisites: AG\_EC 2183 and AG\_EC 2225 or instructor's consent.

**AG\_EC 4301. Topics in Agricultural Economics. 1-6 Credit.**

Current and new topics not currently offered in applied and/or theoretical areas in Agricultural Economics.

**AG\_EC 4310. Local Economic Analysis. 1 Credit.**

Economic based theory, including multipliers and how local economies are affected by external events. Methods for local economic analysis: trends, location quotients, shift-share, and retail analyses. Prerequisite: junior standing.

**AG\_EC 4340. Rural Real Estate Appraisal. 3 Credits.**

Principles, techniques, practices of rural real estate appraisal. Field trips. Prerequisites: AG\_EC 3260.

**AG\_EC 4356. Environmental Law and Policy. 3 Credits.**

Legislative, administrative, and common law dealing with the environment. Introduces the fundamental concepts and classic issues underlying the body of law and policy dealing with the environment. Includes air and water quality, endangered species preservation, land use, and waste disposal. Prerequisites: senior or graduate standing. For non-law students. Recommended AG\_EC 2156, AG\_EC 3256 or AG\_EC 3257.

**AG\_EC 4940. Internship Experiences in Agricultural Economics. 1-3 Credit.**

Combines study, observation, and employment in a public agency or private firm in marketing, farm management, or credit. Staff supervision and evaluation. Reports required. Prerequisites: 2.5 GPA; 75 hours of course work and instructor's consent. Graded on S/U basis only.

**AG\_EC 4962. Planning the Farm Business. 3 Credits.**

Economic analysis and planning of the farm business and its organization. Applications of computerized management techniques to farm business including resource acquisition, tax management, enterprise analysis, and business analysis through farm records and budgets. Prerequisites: AG\_EC 3260 or AFNR 1111 or equivalent.

**AG\_EC 4971. Agribusiness Management Strategy. 3 Credits.**

Analysis of industry forces in agriculture and food sector. Assessing risks and firms' capabilities. Development of firm's competitive strategy, including vertical integration, diversification, international business option, and financial planning and performance measurement. Prerequisites: AG\_EC 2183, AG\_EC 3282, AG\_EC 3286, ENGLSH 1000 and AFNR 1111.

**AG\_EC 4972. Agri-Food Business and Cooperative Management. 3 Credits.**

Risk management in the global agrifood chain, including managing the unique uncertainties of biological production processes, global market analysis, and government intervention, of risk management tools and institutions unique to strategic decision making in agribusiness and

cooperative firms. Prerequisites: AG\_EC 2183, AG\_EC 3256, AG\_EC 3286 and AG\_EC 4971.

**AG\_EC 4983. Strategic Entrepreneurship in Agri-Food. 3 Credits.**

Strategic entrepreneurship is the search for opportunities to generate income streams from innovation, development of new markets, and altering the rivalry positions in existing markets. Prerequisites: AG\_EC 3257, AG\_EC 3282, AG\_EC 3283, and AG\_EC 3383; senior standing.

**AG\_EC 4990. Agricultural Economics Capstone Seminar. 3 Credits.**

Apply key concepts of agricultural economics in traditional and non-traditional settings. Prerequisites: AG\_EC 3230, AG\_EC 3251, and senior standing.

**AG\_EC 4995. Economics of Agricultural Production and Distribution. 3 Credits.**

Applies economic principles to agricultural production including price theory, linear programming and uncertainty. Prerequisites: ECONOM 3251, STAT1400 or equivalent.

**AG\_EC 7110. In-Service Course in Agricultural Economics. 2-10 Credit.**

A. Profit Maximizing Principles B. Farm Planning C. Farm Records and Analysis D. Business Management E. Using Computers in Farm Management Decision Making. Basic principles of farm management. Applications of principles and subject matter in successful classroom presentation primarily for high school teachers. Course is offered in sections A-E as listed, for 2 hours each. Prerequisites: graduate standing and 10 hours credit in Agricultural Economics, including AG\_EC 3260, or instructor's consent.

**AG\_EC 7295. Agricultural Risk Management. 3 Credits.**

This class will examine the range of risks businesses face and explore ways of characterizing and evaluating those risks. Prerequisites: AG\_EC 2183 and AG\_EC 2225 or instructor's consent. Graduate standing required.

**AG\_EC 7301. Topics in Agricultural Economics. 1-6 Credit.**

Current and new topics not currently offered in applied and/or theoretical areas in Agricultural Economics. Prerequisite: graduate standing.

**AG\_EC 7310. Local Economics Analysis. 1 Credit.**

Economic based theory, including multipliers and how local economies are affected by external events. Methods for local economic analysis: trends, location quotients, shift-share, and retail analyses. On-line course.

**AG\_EC 7340. Rural Real Estate Appraisal. 3 Credits.**

Principles, techniques, practices of rural real estate appraisal. Field trips. Prerequisites: graduate standing and AG\_EC 3260.

**AG\_EC 7356. Environmental Law and Policy. 3 Credits.**

Legislative, administrative, and common law dealing with the environment. Introduces the fundamental concepts and classic issues underlying the body of law and policy dealing with the environment. Includes air and water quality, endangered species preservation, land use, and waste disposal. Prerequisites: graduate standing. For non-law students. Recommended AG\_EC 2156, AG\_EC 3256 or AG\_EC 3257.

**AG\_EC 7940. Internship Experiences in Agricultural Economics. 1-3 Credit.**

Combines study, observation, and employment in a public agency or private firm in marketing, farm management, or credit. Staff supervision and evaluation. Reports required. Prerequisites: graduate standing and 2.5 GPA; 75 hours of course work and instructor's consent. Graded on S/U basis only.



**AG\_EC 7962. Planning the Farm Business. 3 Credits.**

Economic analysis and planning of the farm business and its organization. Applications of computerized management techniques to farm business including resource acquisition, tax management, enterprise analysis, and business analysis through farm records and budgets. Prerequisites: graduate standing and AG\_EC 3260 or AFNR 1111 or equivalent.

**AG\_EC 7971. Agribusiness Management Strategy. 3 Credits.**

Analysis of industry forces in agriculture and food sector. Assessing risks and firms capabilities. Development of firm's competitive strategy, including vertical integration, diversification, international business option, and financial planning and performance measurement. Prerequisites: graduate standing and AG\_EC 2183, AG\_EC 3282, AG\_EC 3286, ENGLISH 1000 and AFNR 1111.

**AG\_EC 7972. Agri-Food Business and Cooperative Management. 3 Credits.**

Risk management in the global agrifood chain, including managing the unique uncertainties of biological production processes, global market analysis, and government intervention, of risk management tools and institutions unique to strategic decision making in agribusiness and cooperative firms. Prerequisites: graduate standing and AG\_EC 2183, AG\_EC 3256 and AG\_EC 3286.

**AG\_EC 7995. Economics of Agricultural Production and Distribution. 3 Credits.**

Applies economic principles to agricultural production including price theory, linear programming and uncertainty. Prerequisites: graduate standing and ECONOM 3251, STAT 1400 or equivalent.

**AG\_EC 8001. Advanced Topics in Economics. 3 Credits.**

Analyzes economic logic problems. Current agricultural economic problems. Prerequisite: graduate standing.

**AG\_EC 8010. Research Methodology. 3 Credits.**

Students explore the roles of theory and methods in economics research, develop a program of research, and critique published research. Students also study the scientific methods and the research process, including problem definition, research design, data collection and analysis, and generalization. Prerequisite: graduate standing.

**AG\_EC 8024. Advanced Production Economics. 3 Credits.**

Production function analyses and advanced theory of the firm as applied to agricultural production problems. Concepts of input demand, production supply, quality, time and technology, dynamic analysis and production under uncertainty. Prerequisites: MATH 1500, AG\_EC 4995; ECONOM 8451; STAT 4510 or ECONOM 8472.

**AG\_EC 8050. Economics of Institutions and Organizations. 3 Credits.**

This course expands upon the fundamental principles of neo-classical economics by relaxing traditional behavioral and informational assumptions and by introducing the importance of transaction costs and institutions for economic analysis. Prerequisite: graduate standing.

**AG\_EC 8060. Mathematical Modeling for Social Scientist. 3 Credits.**

Introduction to mathematical programming, emphasizing problem formulation and solution interpretation. Computer applications are stressed. Prerequisite: STAT 4510.

**AG\_EC 8085. Masters Problems in Agricultural Economics. 1-99 Credit.**

Supervised study, research in specialized phases of agricultural economics. Prerequisite: instructor's consent.

**AG\_EC 8087. Seminar in Agricultural Economics. 1 Credit.**

Lectures, reports on economic problems in agriculture.

**AG\_EC 8090. Masters Thesis Research in Agricultural Economics. 1-6 Credit.**

Independent investigation of advanced nature, leading to dissertation. Graded on a S/U basis only.

**AG\_EC 8210. Theory of Markets. 3 Credits.**

Development of theories of monopolistic, monopolistic competition; application to agricultural markets. Market structure influence on price, nonprice competition in buying, selling of farm products and inputs. Prerequisites: ECONOM 7351.

**AG\_EC 8350. Regional Development Issues and Analysis. 3 Credits.**

(same as PUB\_AF 8350). Examines theories of regional growth and development and methods for analysis with applications to current policy issues. Topics include firm location, new economic geography and agglomeration theory, clusters, human capital, migration, social capital, tax and development incentives, and sustainable regional development. Prerequisites: ECONOM 7351 or PUB\_AF 8190 or equivalent.

**AG\_EC 8410. Natural Resource and Environmental Economics. 3 Credits.**

Contemporary natural resource/environmental problems; natural resource capacity, alternative economic theories, property rights, externalities, market failures, efficient use of exhaustible and renewable resources, and economics of environmental pollution. Prerequisites: ECONOM 7351.

**AG\_EC 8430. International Agricultural Development Policy. 3 Credits.**

An analytical review of economic policies directed toward stimulating agricultural development in the world's low income countries. Prerequisites: ECONOM 7351, ECONOM 7353.

**AG\_EC 8448. Society and Ecosystems Research Seminar. 3 Credits.**

(same as RU\_SOC 8448 and NAT\_R 8448). This seminar, capstone for the Graduate Certificate Program in Society and Ecosystems, exposes students to interdisciplinary research on interactions between social, economic and ecological systems.

**AG\_EC 8450. Masters Non Thesis Research. 1-6 Credit.**

Independent investigation of advanced nature. Report required.

**AG\_EC 8520. Economics of Transaction and Contracting. 3 Credits.**

This course focuses on the economic incentives underlying transaction relationships and develops and implements a framework for analyzing contract documents governing various kinds of transactions. Graduate standing required.

**AG\_EC 8610. Economic and Sociological Approaches to Collective Action. 3 Credits.**

(same as RU\_SOC 8610). This course identifies analytical and methodological tools, including rational choice and social capital, to deal with practical problems of collective action in: agricultural cooperatives, rural community development, political interest groups and other mutuals. Prerequisite: AG\_EC 7972.

**AG\_EC 9001. Advanced Topics in Economics II. 3 Credits.**

Analyzes economic logic problems. Current agricultural economic problems. Prerequisite: graduate standing.

**AG\_EC 9040. Advanced Microeconomics Theory and Applications I. 3 Credits.**

First semester course that rigorously examines the microeconomic theory of producer and consumer behavior, combined with applications of the

theoretical concepts to empirical economic research on agricultural, business, development, and environmental issues. Prerequisite: ECONOM 7351, graduate standing or instructors consent. Graded on A/F basis only.

**AG\_EC 9042. Advanced Microeconomics Theory and Applications II. 3 Credits.**

Second semester advanced micro theory covering choice under uncertainty, industry structure, game theory, information econ, and political economy of regulation. Includes applications of micro models to issues in agricultural, natural resource, and development sectors. Prerequisite: AG\_EC 9040. Graduate standing required.

**AG\_EC 9085. Doctoral Problems in Agricultural Economics. 1-99 Credit.**

Supervised study, research in specialized phases of agricultural economics. Prerequisite: instructor's consent.

**AG\_EC 9090. Doctoral Dissertation Research in Agricultural Economics. 1-99 Credit.**

Independent investigation of advanced nature, leading to dissertation. Graded on a S/U basis only.

**AG\_EC 9220. Advanced Price Analysis. 3 Credits.**

Applies economic theory and quantitative methods to analyze agricultural price issues. Examines problem formulation, estimation, and model evaluation applied to demand and supply situations. Prerequisites: ECONOM 8451 or ECONOM 8472; STAT 4510.

**AG\_EC 9230. Welfare and Consumption Economics. 3 Credits.**

Introduces welfare economic principles; application to problems of resource allocation. Appraises economic policies, programs; consumers' choice; measurement of consumption; living standards; household decisions and markets relation. Prerequisites: ECONOM 8451 or instructor's consent.

**AG\_EC 9265. Food, Agricultural and Rural Policy. 3 Credits.**

Application of welfare economics theory to food, agricultural and rural development policy analysis. Historical perspective and economics analysis of contemporary issues in national and international policy and institutions. Prerequisites: ECONOM 7351 and AG\_EC 8230.

**AG\_EC 9320. Regional Economic Theory and Methods. 3 Credits.**

Theory of spatial economics: Central place theory, spatial labor markets, location theory, social accounting matrices, input-output, computable general equilibrium, geographic information systems and regional econometric models. Prerequisites: ECONOM 7351, ECONOM 7353, and matrix algebra.

**AG\_EC 9475. Econometrics I. 3 Credits.**

Emphasis is given to special estimation problems which occur in integrating the theory with various types of economic data.

**AG\_EC 9476. Econometrics II. 3 Credits.**

(same as ECONOM 9476).

**AG\_EC 9510. Economics of Agribusiness Firm. 3 Credits.**

This course builds on transaction cost-based theories and tools to study the economic underpinnings of intra-firm organization, firm boundaries, and the structure of inter-firm transactions. Prerequisite: AG\_EC 8050.

**AG\_EC 9520. Economics of Agribusiness Markets. 3 Credits.**

Relationships of neoclassical and new institutional economics to designing organizational strategy and structure. Internal coordination and structure, organizational boundaries, and competitiveness and sustainability of food system organizations. Prerequisite: AG\_EC 8050.

## **Agricultural Education (AG\_ED)**

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**AG\_ED 1000. Orientation to Agricultural Education. 1 Credit.**

Overview of the discipline of agricultural education including: career opportunities, certification requirements, professional development, and current issues.

**AG\_ED 2220. Verbal Communication in Agriculture, Food and Natural Resources. 3 Credits.**

Application of verbal communication skills used in the dissemination of information related to agriculture, food, and natural resource topics. Acquisition of interpersonal communication skills and small group, impromptu and professional presentation skills. Restricted to College of Agriculture, Food and Natural Resources students only during Early Registration.

**AG\_ED 2250. Introduction to Leadership. 3 Credits.**

Overview of basic leadership principles and theories, including, but not limited to: personal leadership development, characteristics of effective leaders, leadership styles, ethics as a leader and leadership obstacles.

**AG\_ED 2260. Team and Organizational Leadership. 3 Credits.**

Principles and practices in planning, developing, conducting, and evaluating leadership programs for agricultural groups. The course focuses on helping students better understand themselves and others, improving group communications; becoming effective leaders and members of groups; improving leadership and personal development skills; assessing leadership situations, determining and administering appropriate leadership strategies, and evaluating results.

**AG\_ED 3085. Problems in Agricultural Education. 1-99 Credit.**

Supervised and independent study of problems and issues in Agricultural Education at the undergraduate level. Prerequisite: instructor's consent.

**AG\_ED 3310. Teaching Financial Management and Economics. 2 Credits.**

Application of methods and techniques used in teaching principles of financial management and economics. Topics include: Agricultural accounting principles, depreciation, tax management, credit management, budgeting, and economic principles.

**AG\_ED 3320. Metal Fabrication and Laboratory Management. 3 Credits.**

Application of metal fabrication skills, including cutting, bending, and welding, using a variety of processes. Operations of hand tools and power equipment used in project construction. Also includes laboratory management, instructional strategies, and assessment techniques related to secondary agriculture programs. Prerequisite: junior standing.

**AG\_ED 4001. Topics in Agricultural Education. 1-3 Credit.**

Courses on specialized topics offered on a trial basis until the course has been assigned a course number.

**AG\_ED 4087. Internship Seminar in Agricultural Education. 3 Credits.**

Seminar focused on the problems of practice and developing skills needed for a career in teaching agriculture at the secondary level. The core of the seminar is on coordinating experiential learning and leadership development activities, managing the complete program, and professional development. Prerequisite: concurrent enrollment in AG\_ED 4995.

**AG\_ED 4310. Rationale and Structure of Agricultural Education Programs. 3 Credits.**

This course provides future agricultural educators with a comprehensive overview of a complete Agricultural Education program involving classroom instruction, supervised experience, and personal development. Prerequisite: junior standing.

**AG\_ED 4311. Integrated Field Experience I. 1 Credit.**

A field-based experience that provides students with comprehensive experience directed toward the planning, supervision, and evaluation of Supervised Agricultural Experience Programs in secondary agriculture programs. Prerequisite: concurrent enrollment in AG\_ED 4310. Graded on S/U basis only.

**AG\_ED 4320. Methods of Teaching I. 3 Credits.**

Investigations into the teaching and learning process which including lesson planning, direct instruction methods, and assessment. Prerequisites: junior standing; acceptance into Phase II of Teacher Development Program or permission of instructor.

**AG\_ED 4321. Integrated Field Experience II. 1 Credit.**

A field-based experience that examines the integration of Supervised Agricultural Experience and Career Development Events into the secondary agriculture curriculum. Investigates the use of advisory committees and graduate follow-up data in curriculum planning. Prerequisite: concurrent enrollment in AG\_ED 4320. Graded on S/U basis only.

**AG\_ED 4330. Methods of Teaching II. 3 Credits.**

Further investigations into the teaching and learning process which includes methods beyond direct instruction, classroom and behavior management, and curricular design. Prerequisite: AG\_ED 4320; acceptance into Phase II of Teacher Development Program or permission of the instructor.

**AG\_ED 4340. Designing and Delivering Nonformal Educational Programs. 4 Credits.**

Course designed to overview learning theory and practice applicable to teaching adults and youth in nonformal education contexts including: planning programs, methods of instructional delivery, marketing, and evaluation of educational outcomes. Prerequisite: AG\_ED 2220 or equivalent; junior or senior standing.

**AG\_ED 4993. Internship in Agricultural Education. 1-4 Credit.**

Field-based learning experience that combines study, observation, and employment with an agricultural business, industry or government agency in the area of education, training, and development. Individual internship plans are developed by a student, faculty supervisor, and an industry cooperator. Prerequisite: departmental consent.

**AG\_ED 4995. Student Teaching Internship in Agriculture. 1-12 Credit.**

A field-based learning experience that combines observation and practice in a secondary/adult agriculture program. The purpose of the internship is to provide an opportunity to apply teaching and learning concepts in a practical context. Prerequisite: departmental consent.

**AG\_ED 7087. Internship Seminar in Agricultural Education. 3 Credits.**

Seminar focused on the problems of practice and developing skills needed for a career in teaching agriculture at the secondary level. The core of the seminar is on coordinating experimental learning and leadership development activities, managing the complete program,

and professional development. Prerequisite: graduate standing and concurrent enrollment AG\_ED 4995.

**AG\_ED 7310. Rationale and Structure of Agricultural Education. 3 Credits.**

This course provides future agricultural educators with a comprehensive overview of a complete Agricultural Education program involving classroom instruction, supervised experience, and personal development. Prerequisite: graduate standing.

**AG\_ED 7320. Methods of Teaching I. 3 Credits.**

Investigations into the teaching and learning process which includes lesson planning, direct instruction methods, and assessment. Prerequisites: Graduate standing and acceptance into the Teacher Certification option.

**AG\_ED 7330. Methods of Teaching II. 3 Credits.**

Further investigations into the teaching and learning process which includes methods beyond direct instruction, classroom and behavior management, and curricular design. Prerequisites: Graduate standing; acceptance into Teacher Certification option and AG\_ED 4320/7320.

**AG\_ED 7340. Designing and Delivering Nonformal Educational Programs. 4 Credits.**

Course designed to overview learning theory and practice applicable to teaching adults and youth in nonformal education contexts including: planning programs, methods of instructional delivery, marketing, and evaluation of educational outcomes. Prerequisite: AG\_ED 2220 or equivalent.

**AG\_ED 7350. Inservice Course in Agricultural Education. 1-99 Credit.**

Professional development course which focuses on enhancing the technical, administrative, or management skills of agricultural educators.

**AG\_ED 8080. Creative Component in Agricultural Education. 1-3 Credit.**

Independent original work that culminates in a scholarly project, document or presentation. Prerequisite: instructor's consent. Graded on S/U basis only.

**AG\_ED 8085. Problems in Agricultural Education. 1-99 Credit.**

Prerequisite: instructor's consent.

**AG\_ED 8087. Seminar in Agricultural Education. 1-99 Credit.**

Seminar in Agricultural Education.

**AG\_ED 8090. Thesis Research in Agricultural Education. 1-99 Credit.**

Independent research activities by a master's student that culminates in a thesis. Prerequisite: instructor's consent. Graded on S/U basis only.

**AG\_ED 8210. History and Leadership of the Land Grant University. 2 Credits.**

Historical overview of the evolution and development of land-grant colleges. Students examine early public mandates and evaluate education, research, public service developments and new initiatives needed for Land Grant universities to effectively serve society. Prerequisite: graduate standing.

**AG\_ED 8250. Leadership Theory and Application. 3 Credits.**

Survey of concepts, theories and practices of leadership, personal development and group dynamics. Exploration of leadership traits and models with a focus upon how they apply to Agricultural Education.

**AG\_ED 8330. Advanced Methods of Teaching. 3 Credits.**

Explores the principles and psychological aspects of teaching and learning; teaching strategies, methods, and techniques; evaluating

student learning; motivating students; and personal teacher behaviors that influence learning.

**AG\_ED 8340. Student and Teacher Development in Agricultural Education. 3 Credits.**

Examines planning and supervising career exploration, experiential learning, and leadership development activities of secondary agriculture students. The professional development of the secondary agriculture teacher is also examined. Prerequisite: AG\_ED 4310 or equivalent.

**AG\_ED 8350. College Teaching of Agriculture, Food and Natural Resources. 3 Credits.**

A course designed to assist current or future college faculty who wish to improve their teaching skills. Topics include theories, principles and practices associated with effective teaching and learning in higher education.

**AG\_ED 8351. Induction Year Teaching I. 1-2 Credit.**

Continuing education course for the professional development of first-year teachers of agriculture. The course focuses on the pedagogical knowledge, skills, and attitudes and managerial skills needed by beginning teachers of agriculture.

**AG\_ED 8352. Induction Year Teaching II. 1-2 Credit.**

Continuing education course for the professional development of second-year teachers of agriculture. The course is a continuation of AG\_ED 7351 and focuses on the pedagogical knowledge, skills, and attitudes and managerial skills needed by beginning teachers of agriculture. Prerequisite: AG\_ED 7351.

**AG\_ED 8410. Philosophical Foundations of Agricultural Education. 1-3 Credit.**

Overview of the history and philosophical development of agricultural education as a discipline. Philosophers, policy makers, movements, trends, and legislation that has influenced agricultural education. Current issues and future trends impacting the field. Graded on A/F basis only.

**AG\_ED 8430. Evaluation of Educational Programs. 3 Credits.**

(same as RU\_SOC 8430). Examines program evaluation concepts, principles, and models; and identifies major steps in planning, conducting, and reporting results of evaluation objects.

**AG\_ED 8510. Research Methods and Design. 3 Credits.**

(same as RU\_SOC 8510). A foundations course on quantitative research methodology and design principles for investigating problems in social and behavioral sciences. A focus is on the language of research, purposes, validity threats, and data collection methods. Graded on A/F basis only.

**AG\_ED 8520. Preparing Manuscripts for Publication. 1 Credit.**

An introduction to planning, preparing, and submitting research based articles for publication in professional journals and research proceedings.

**AG\_ED 8530. Grant Proposal Writing. 2 Credits.**

Preparation of proposals designed to solicit grant funding to support teaching, research or outreach programs. Emphasis on proposal development, identifying funding sources, and proposal review processes.

**AG\_ED 8540. Methods of Qualitative Research. 3 Credits.**

(same as RU\_SOC 8540). Overview of philosophies, approaches toward, design, data collection, analysis and reporting of qualitative research.

**AG\_ED 8995. College Teaching Practicum. 3 Credits.**

Learning experience that combines the study, observation, and practice of teaching university-level courses in food, agriculture and/or natural

resources under the supervision of teaching mentors. Prerequisite: instructor's consent and AG\_ED 8330 or 8350. Graded on S/U basis only.

**AG\_ED 9090. Doctoral Research in Agricultural Education. 1-99 Credit.**

Independent research activities by a doctoral student that culminates in a dissertation or other scholarly work. Prerequisite: instructor's consent. Graded on S/U basis only.

**AG\_ED 9410. Foundations and Practices of Teacher Education. 3 Credits.**

Foundations and practices of teacher preparation programs including student selection and advisement, licensure requirements, accreditation, curriculum, clinical and field experiences, supervision, evaluation and research. Prerequisite: Doctoral student or instructor's consent.

**AG\_ED 9510. Data Collection, Analysis and Interpretation. 3 Credits.**

(same as RU\_SOC 9510). A quantitative methods course in measurement, data collection and analysis related to social and behavioral science research. An applied approach is taken on instrumentation and analyzing data using descriptive and inferential statistics. Practical skills in data manipulation using SPSS are developed. Prerequisite: AG\_ED 8510 RU\_SOC 8510 or instructor's consent. Graded on A/F basis only.

## Agricultural Systems Management (AG\_S\_M)

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**AG\_S\_M 1002. Topics in Agricultural Systems Management-Biological/Physical/Math. 3 Credits.**

Current and new technical developments in agricultural systems management. Prerequisites: 6 hours in AG\_S\_M or instructor's consent.

**AG\_S\_M 1020. Introduction to Agricultural Systems Management. 3 Credits.**

Introductory course that acquaints students with the general technical areas of Agricultural Systems Management. A systematic problem-solving approach is applied to problems derived from each of the technical areas within Agricultural Systems Management .

**AG\_S\_M 1040. Physical Principles for Agricultural Applications. 3 Credits.**

Introductory survey course to help students: formulate problems; understand units/accuracy; learn basic definitions; understand simple machines, power transmission, fluid statics, electricity, heat-flow, and temperature/moisture relationships. Prerequisite: MATH 1120.

**AG\_S\_M 1120. Agricultural/Industrial Materials and Processes. 3 Credits.**

Structure and properties of manufacturing materials; conditioning and machining materials; assembling processes; finishing processes; automation of manufacturing systems.

**AG\_S\_M 2002. Topics in Agricultural Systems Management-Biological/Physical/Math. 3 Credits.**

Current and new technical developments in agricultural systems management. Prerequisites: 6 hours in AG\_S\_M or instructor's consent.

**AG\_S\_M 2020. Environmental Ethics in Agriculture. 3 Credits.**

Influence of agricultural technology and production practices on environmental quality. Stewardship concepts. Long-term vs. short-term consequences. Development of a scientifically sound ethic toward

agricultural production. Prerequisites: ENGLSH 1000 and sophomore standing.

**AG\_S\_M 2220. Agricultural/Industrial Structures. 3 Credits.**

A building science course looking at construction materials, structural component selection, ventilation, moisture control and energy use. Prerequisite: MATH 1100 required, AG\_S\_M 1040 recommended or instructor's consent. Math reasoning proficiency course.

**AG\_S\_M 2320. Internal Combustion Power. 3 Credits.**

Basic internal combustion engine principles, mechanisms, combustion cycles, fuels, fuel injection, electrical systems, engine testing. Prerequisite: AG\_S\_M 1040.

**AG\_S\_M 2340. Pesticide Application Equipment. 3 Credits.**

Principles of pesticide application; sprayer hydraulics and spray atomization; calibration, mixing calculations and compatibility of tank mixes; personal and environmental protection; pesticide labels and regulations. Students earn their private applicators license. Prerequisites: MATH 1100 or instructor's consent.

**AG\_S\_M 2345. Chemical Application Systems. 2-3 Credit.**

Systems, components and operation practices used in the chemical application industry. Liquid and granular application systems and respective components will be studied along with procedures for minimizing drift, system calibration, recommended maintenance, and off-season storage procedures. Prerequisite: MATH 1100 or equivalent.

**AG\_S\_M 2360. Fluid Power. 3 Credits.**

Basic power hydraulic theory. Hydraulic systems, components and circuits. Prerequisite: MATH 1100; sophomore standing. Math reasoning proficiency course.

**AG\_S\_M 3350. Problems in Agricultural Systems Management. 1-5 Credit.**

Supervised independent study at the undergraduate level. Prerequisite: instructor's consent.

**AG\_S\_M 4020. Agricultural Safety and Health. 3 Credits.**

Analysis, organization and implementation of agriculture safety and health programs. Physical and economic impact of accidents, standards and liabilities. Role of man in the man-machine system. Prerequisite: junior or senior standing or instructor's consent.

**AG\_S\_M 4120. Advanced Agricultural/Industrial Materials and Processes. 2-3 Credit.**

Primarily for students majoring in agricultural education. Applies shop principles to the design and construction of projects. Prerequisite: instructor's consent.

**AG\_S\_M 4140. Electricity: Wiring and Equipment. 3 Credits.**

Home and agricultural electricity; emphasis on proper selection and use of electrical wiring materials and equipment. Basic electrical theory. Prerequisites: MATH 1100 or instructor's consent; junior standing.

**AG\_S\_M 4145. Sensors and Control Systems for Agri-Industries. 2 Credits.**

This course helps one understand sensors including performance, data acquisition systems and selection. In addition, introduction to programmable logic controllers, ladder-rung diagram programming, fluid flow rate, and associated analysis is discussed. Prerequisites: AG\_S\_M 1040 and AG\_S\_M 4140; junior standing required.

**AG\_S\_M 4150. Biorenewable Systems Technology. 3 Credits.**

Converting biorenewable resources into bioenergy and biobased products. Biorenewable concepts as they relate to drivers of change,

feedstock production, processes, products, co-products, economics, transportation and logistics, and marketing. Prerequisites: Mathematics MATH 1100, Chemistry CHEM 1100 and Agricultural Economics AG\_EC 1041 or equivalent.

**AG\_S\_M 4220. Material Handling and Conditioning. 3 Credits.**

Principles required for processing and handling food and feed materials; selection of machines; analysis and development of systems for processing and handling grain and bulk material. Prerequisites: MATH 1100, AG\_S\_M 1040 and junior standing.

**AG\_S\_M 4225. Preservation of Grain Quality. 2 Credits.**

Principles and management for grain quality preservation. Grain drying and grain storage. Psychrometrics. Fan and airflow. Grain handling methods and system planning. Grain quality measurement and end-use value analysis. Prerequisite: MATH 1100 or equivalent.

**AG\_S\_M 4320. Agricultural Equipment and Machinery. 3 Credits.**

Operation of agricultural machinery. Selection and management of equipment. Prerequisite: AG\_S\_M 1040 and junior standing.

**AG\_S\_M 4350. Problems in Agricultural Systems Management. 1-5 Credit.**

Supervised independent study at the undergraduate level. Prerequisite: instructor's consent.

**AG\_S\_M 4360. Precision Agriculture Science and Technology. 3 Credits.**

(same as PLNT\_S 4360 and SOIL 4360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management. Prerequisites: SOIL 2100, PLNT\_S 2110 or instructor's consent.

**AG\_S\_M 4365. Machinery Management Using Precision Agriculture Technology. 3 Credits.**

Planters, combines, fertilizer application equipment, and sprayer management along with GPS technologies are the focus of the course. One will learn how to manage these tools efficiently and accurately. Valuable precision agriculture management skills emphasized. Junior standing required. Prerequisite: Prefer AG\_S\_M 4360.

**AG\_S\_M 4370. In-Service Course AG S M.-Farm Power and Machinery. 1-8 Credit.**

A. Farm Power and Machinery B. Farm Buildings and Conveniences C. Soil and Water Management D. Rural Electrification and Processing E. Agricultural Construction and Maintenance Basic principles relating to agricultural systems management. Applies principles and subject matter in successful classroom presentation at the high school level. Prerequisites: 10 credits from Agricultural System Management courses; a B.S. degree in Agriculture or instructor's consent.

**AG\_S\_M 4390. Optimization and Management of Food and Agricultural Systems. 3 Credits.**

(same as F\_S 4390 and HSP\_MGMT 4390). This course is designed to introduce the student to the concept of layers and interacting systems within an operation and the analytical methods of modeling and simulation to make effective management decisions for optimal system design and function. Prerequisite: MATH 1100.

**AG\_S\_M 4420. Surface Water Management. 3 Credits.**

Topics include hydrology; soil erosion precautions; elementary surveying; selection and layout of ponds, terraces and water control structures. Prerequisites: MATH 1100 and junior standing.

**AG\_S\_M 4440. Water Quality and Pollution Control. 3 Credits.**

Applies scientific principles to a variety of water quality problems arising from activities associated with nonpoint pollution, agricultural chemicals, land disposal of wastes, on-site sewage disposal and individual drinking water systems. Prerequisites: MATH 1100, and junior standing.

**AG\_S\_M 4460. Irrigation and Drainage. 3 Credits.**

Soil, water, plant relationships. Selection and layout of irrigation and drainage systems. Prerequisites: AG\_S\_M 4420 or instructor's consent.

**AG\_S\_M 4940. Agricultural Systems Management Internship. 2-5 Credit.**

Problem course following prior approved internship work experience. Problem selected by internship company representative, faculty problem advisor and student. Supervised by faculty problem advisor and presented in technical report form.

**AG\_S\_M 4970. Agricultural Systems Management - Capstone. 3 Credits.**

Capstone course required of Agricultural Systems Management majors. Team project involving extensive use of the students education, oral presentations and comprehensive written reports are required. Class experiences include but may not be limited to system selection and comparison, replacement and operating cost calculations, life cycle costing, and business feasibility analysis. Prerequisites: Senior Standing.

**AG\_S\_M 7001. Topics in Agricultural Systems Management. 3 Credits.**

Initial offering of a course in a specific subject matter area related to Agricultural Systems Management. The course is offered when proposed by a faculty member in that area of expertise. Prerequisite: graduate standing or instructor's consent.

**AG\_S\_M 7020. Agricultural Safety and Health. 3 Credits.**

Analysis, organization and implementation of agriculture safety and health programs. Physical and economic impacts of accidents, standards and liabilities. Role of man in the man-machine system. Prerequisite: graduate standing or instructor's consent.

**AG\_S\_M 7085. Problems in Agricultural Systems Management. 1-99 Credit.**

Supervised individual study at the graduate level.

**AG\_S\_M 7120. Advanced Agricultural/Industrial Materials and Processes. 2-3 Credit.**

Primarily for students majoring in agricultural education. Applies shop principles to the design and construction of projects. Prerequisite: graduate standing and instructor's consent.

**AG\_S\_M 7140. Electricity: Wiring and Equipment. 3 Credits.**

Home and agricultural electricity; emphasis on proper selection and use of electrical wiring materials and equipment. Basic electrical theory. Prerequisite: graduate standing.

**AG\_S\_M 7220. Material Handling and Conditioning. 3 Credits.**

Principles required for processing and handling food and feed materials; selection of machines; analysis and development of systems for processing and handling grain and bulk materials. Prerequisite: MATH 1100, AG\_S\_M1040 and graduate standing.

**AG\_S\_M 7320. Agricultural Equipment and Machinery. 3 Credits.**

Operation of agricultural machinery. Selection and management of equipment. Prerequisite: Agricultural Systems Management AG\_S\_M 1040 and graduate standing.

**AG\_S\_M 7340. Agricultural Mechanization Systems. 3 Credits.**

Review of current literature. Case study of mechanization systems. Computer analysis of management alternatives. Prerequisites: graduate standing.

**AG\_S\_M 7360. Precision Agriculture Science and Technology. 3 Credits.**

(same as PLNT\_S 7360 and SOIL 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management. Prerequisites: graduate standing and SOIL 2100, PLNT\_S 2110 or instructor's consent.

**AG\_S\_M 7365. Machinery Management Using Precision Agriculture Technology. 3 Credits.**

This course focuses on agricultural equipment that is commonly used in conjunction with GPS technology. Planters, combines, fertilizer application equipment and sprayer application equipment are commonly equipped with GPS equipment to control and record operational parameters. These parameters focus around the equipments geographic location and can be recorded simultaneously with the volume of product applied and weather information (wind, temperature, humidity, etc.). GPS guidance is one of the main technologies to be studied throughout this course. The management of this equipment and the GPS technologies used to control and record this information is the focus of the course. Prerequisite: AG\_S\_M 7360 recommended.

**AG\_S\_M 7370. In-Service Course AG S M.-Farm Power and Machinery. 1-8 Credit.**

A. Farm Power and Machinery B. Farm Buildings and Conveniences C. Soil and Water Management D. Rural Electrification and Processing E. Agricultural Construction and Maintenance Basic principles relating to agricultural systems management. Applies principles and subject matter in successful classroom presentation at the high school level. Prerequisites: graduate standing and 10 credits from Agricultural Systems Management courses; a B.S. degree in Agriculture or instructor's consent.

**AG\_S\_M 7390. Optimization and Management of Food and Agriculture Systems. 3 Credits.**

(same as F\_S 7390 and HSP\_MGMT 7390). This course is designed to introduce the student to the concept of layers and interacting systems within an operation and the analytical methods of modeling and simulation to make effective management decisions for optimal system design and function. Prerequisite: graduate standing; instructor's consent.

**AG\_S\_M 7420. Surface Water Management. 3 Credits.**

Topics include hydrology; soil erosion precautions; elementary surveying; selection and layout of ponds, terraces and water control structures. Prerequisites: MATH 1100 and graduate standing.

**AG\_S\_M 7440. Water Quality and Pollution Control. 3 Credits.**

Applies scientific principles to a variety of water quality problems arising from activities associated with nonpoint pollution, agricultural chemicals, land disposal of wastes, on-site sewage disposal and individual drinking water systems. Prerequisites: MATH 1100, and graduate standing.

**AG\_S\_M 7460. Irrigation and Drainage. 3 Credits.**

Soil, water, plant relationships. Selection and layout of irrigation and drainage systems. Prerequisites: graduate standing and AG\_S\_M 4420 or instructor's consent.

**AG\_S\_M 8085. Problems in Agricultural Systems Management. 3 Credits.**

Supervised individual study at the graduate level.

**AG\_S\_M 8090. Thesis Research in Agricultural Systems Management. 1-99 Credit.**

Independent investigation to be presented as a thesis. Graded on as S/U basis only. Prerequisite: graduate standing.

**AG\_S\_M 8340. Agricultural Mechanization Systems. 3 Credits.**

Review of current literature. Case study of mechanization systems. Computer analysis of management alternatives. Prerequisites: graduate standing.

**AG\_S\_M 9090. Thesis Research in Agricultural Systems Management. 1-99 Credit.**

Independent investigation to be presented as a thesis. Graded on as S/U basis only. Prerequisite: graduate standing.

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## Agriculture, Food and Natural Resources (AFNR)

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**AFNR 1101. Special Topics in Agriculture. 1-3 Credit.**

Selected topics not offered in other courses. Prerequisite: instructor's consent.

**AFNR 1111. Computing and Information Systems I. 3 Credits.**

Provide students with a basic understanding of microcomputer usage, electronic communications, and use of the internet. Topics include operating systems, word processing, database management systems, spreadsheets, electronic mail, online library searches, and the World Wide Web.

**AFNR 1115. Foundations for College Success. 1 Credit.**

An investigation of principles and practices associated with academic success and the interpersonal challenges encountered in collegiate life. Learning preferences, time investment, study skills, degree requirements, and personal development opportunities available in the College and across campus are explored. Prerequisite: freshman standing. Graded on A/F basis only.

**AFNR 1120. Computing and Information Technology. 2 Credits.**

Provides students with a basic understanding of computer usage, electronic communications and use of the internet. Topics include understanding of operating systems, word processing, and presentation media. Restricted to freshmen and sophomores.

**AFNR 2115. College to Career: Strategies for Success. 1 Credit.**

Systematic approach to self-assessment, career research and exploration, goal-setting and implementation of a career development plan. Students will learn specific skills, research knowledge and lifelong career management techniques.

**AFNR 2120. Working with Data Using Excel. 1 Credit.**

Provide students with a basic understanding of computer usage and spreadsheet applications.

**AFNR 2150. Agricultural Travel Course. 1-99 Credit.**

General travel course designed to broaden the perspective of agricultural students. Prerequisites: one course in each of the following areas: agricultural economics, animal science, plant science, and instructor's consent. Cost of course is borne by the student.

**AFNR 2190. International Agriculture and Natural Resources. 1-15 Credit.**

This course is designed to provide students with an introduction into the agriculture/natural resources of the host country. Activities may include course work at an international institution, professional and personal development and special projects. Prerequisites: instructor's and student's advisor consent. Selected sections of this course may be graded either on A/F or S/U basis only.

**AFNR 2191. International Agriculture and Natural Resources - Humanities. 1-6 Credit.**

This course is designed to provide students with an introduction to valuing and appreciating the culture and philosophy entrenched in the host country's civilization through the examination of its arts, culture, language and history. Prerequisites: student's advisor or consent of instructor. May be repeated for credit. Selected sections of the course may be offered on A-F or S/U basis only.

**AFNR 2192. International Agriculture/Natural Resources-Social Science. 1-6 Credit.**

This course is designed to provide students with an examination of the social sciences of the host country; including the sociology, psychology, economics, government, and history of the country; including the dynamics of urban and rural communities. Prerequisite: student's advisor and instructor's consent. May be repeated for credit. Selected sections of this course may be graded either on A/F or S/U basis only.

**AFNR 2215. Introduction to the Theory and Practice of Sustainable Agriculture. 3 Credits.**

This experiential course provides an overview of the theoretical and practical principles of sustainable agriculture by exploring the holistic nature of sustainable agriculture, and analyzing agriculture systems based on their impact on the environment, economy and community.

**AFNR 3115. Lifelong Career Management and Success Strategies. 1 Credit.**

Systematic approach to understanding the importance of effective leadership in the professional world, obtaining transferable skills necessary in the work force, and understanding important aspects that allow one's career to grow over the course of one's professional life. Prerequisites: junior standing or higher. Graded on A/F basis only.

**AFNR 3215. Community Food Systems. 3 Credits.**

Essential concepts in research, implementation and understanding of community food systems and macro-level global trends in food production and distribution will be discussed. Students will examine the social, economic and health implications of conventional and alternative food systems. Prerequisite: AFNR 2215.

**AFNR 3315. Advanced Practices in Sustainable Agriculture. 3 Credits.**

Course furthers students' understanding of sustainable production systems with an emphasis on stewarding natural resources (soil, water, biodiversity and energy) while maintaining and economically profitable enterprise that provides for a good quality of life. Prerequisites: AFNR 2215 and Junior standing. Recommended: SOIL 2100, PLNT\_S 2110 or AN\_SCI 1065 or 2175.

**AFNR 4001. Topics in Agriculture-General. 1-99 Credit.**

Topics in Agriculture-General.

**AFNR 4972. Capstone Project in Agriculture, Food and Natural Resources. 1-3 Credit.**

A culminating learning experience focused on student's area of concentration that requires the application of knowledge and skills taught in the undergraduate curriculum. The capstone project comprises independent, original work culminating in a scholarly project, written document, and/or presentation. Graded on S/U basis only. Prerequisite: junior standing; instructor's consent.

**AFNR 4993. Internship in Agriculture, Food and Natural Resources. 1-6 Credit.**

Field-based learning experience combining the study, observation, and employment with a business, organization, or governmental agency. The internship provides opportunities to apply skills, concepts and theories about agriculture, food and natural resources in a practical context. The student intern, internship supervisor, and university coordinator will develop an individualized internship plan. May be repeated for credit. Prerequisite: junior standing; instructor's consent.

**AFNR 7190. International Agriculture/Natural Resources. 1-9 Credit.**

This course is designed to provide students with an introduction into the agriculture/natural resources of the host country. Activities may include course work at an international institution, professional and personal development and special projects. Prerequisite: graduate standing required and advisor and instructor's consent. Selected sections of the course may be offered on A/F or S/U basis only.

## **Anesthesiology (ANESTH)**

**ANESTH 6203. ABS Anesthesiology Research. 5-10 Credit.**

ABS Anesthesiology Research.

**ANESTH 6205. ABS Anesthesiology Research & Review. 5-10 Credit.**

ABS Anesthesiology Research & Review.

**ANESTH 6400. Anesthesiology. 5 Credits.**

Goals/Objectives: The goals are providing students with opportunities to: 1. Understand the anesthetic state (e.g. the inability of a person to protect themselves from the environment; concomitant and common depression of other systems of the body other than the nervous system). 2. Learn how to think and react quickly and correctly in times of stress. 3. Develop knowledge and skill at maintaining artificial ventilation and circulation. 4. Develop technical skills (e.g. insertion of endotracheal tubes, intravenous catheters). 5. Understand the rationale behind the choice of an anesthetic agent or technique. 6. Learn the function of an anesthesiologist as a perioperative physician and pain consultant. 7. Learn about the specialty of anesthesiology as a possible future career. Notes: Curriculum: Direct participation in anesthetic evaluation and administration for surgical procedures is combined with close individual supervision. Attendance at weekly teaching conferences is expected. Each student will follow a patient pre, intra, and post operatively and write a case presentation. Interblock: First consideration given to students interested in anesthesia as a career choice; honors considered only with documentation of participation and completion of a research project related to anesthesia. Evaluations: Evaluations are compiled from daily encounter cards completed by anesthesia providers, a written paper that discusses one patient's anesthetic, and a 50 question written examination at the end of the rotation.

## **Animal Science (AN\_SCI)**

**AN\_SCI 1001. Topics in Animal Science. 1-4 Credit.**

Various courses offered on a preliminary basis to determine need for such offering prior to submission as a numbered course. Various topics, credit arranged. Prerequisite: departmental consent.

**AN\_SCI 1011. Animal Science. 3 Credits.**

Principles of animal science including importance of animal agriculture, genetics, anatomy, physiology and nutrition.

**AN\_SCI 1012. Introduction to Captive Wild Animal Management. 3 Credits.**

(same as F\_W 1012). General introduction to housing, husbandry, behavior, genetics, nutrition, reproduction, animal health, and disease control of native and exotic species in zoological parks and other animal conservation facilities; emphasizes the role of captive animals in wildlife conservation. Graded on A/F basis only.

**AN\_SCI 1013. Biotechnology in Animal Agriculture. 3 Credits.**

Concepts, discoveries, and applications of biotechnology ranging from the discovery of brewing and baking to animal cloning and genetic engineering are covered. Students will acquire a foundation to understand how biotechnology affects agriculture and our everyday lives. Graded on A/F basis only.

**AN\_SCI 1065. Animal Science Laboratory Practicum. 2 Credits.**

An introductory course in skill related to the care and management of livestock and poultry plus a section dealing with meats and a section dealing with research methods. Students will be expected to participate in hands-on learning development of fundamental skills and animal husbandry. This class will include one 3 hour lab and 1 hour DIS per week.

**AN\_SCI 2001. Topics in Animal Science. 1-4 Credit.**

Various courses offered on a preliminary basis to determine need for such offering prior to submission as a numbered course. Various topics, credit arranged. Prerequisite: departmental consent.

**AN\_SCI 2085. Problems in Animal Science. 1-5 Credit.**

Library and laboratory study of assigned problems in animal breeding, nutrition, physiology or production and management. Planning, conduction and reporting to be in consultation with instructor. Prerequisite: instructor's consent.

**AN\_SCI 2095. Equine Behavior and Training. 3 Credits.**

Students learn the psychology and ethology of equine behavior and how it relates to training. The use and proper fitting of equipment is taught and students learn to teach horses to perform the basic movements needed prior to advancing to specialized training. Prerequisite: AN\_SCI 1065 and instructor's consent.

**AN\_SCI 2110. Global Animal Agriculture. 2 Credits.**

Animal Agriculture as influenced globally by political, religious cultural, economic and climatic factors. Prerequisite: sophomore standing.

**AN\_SCI 2111. Sophomore Seminar: Societal Issues Facing Animal Agriculture. 3 Credits.**

Course designed to introduce students to key issues facing animal agriculture. Assignments focus on reading current publications associated with issues affecting the animal agriculture industry. Prerequisite: ENGLISH 1000. Graded on A/F basis only.



**AN\_SCI 2114. Live Animal and Meat Evaluation. 3 Credits.**

(same as F\_S 2114). The composition and quality meat produced from food animals is the driving component of livestock economic value. This course will teach the principles and procedures involved in evaluation, grading, selection, and economic value of meat animals and poultry and the carcasses they produce. This course is an excellent introduction and (or) prerequisite for all livestock production courses and will provide a baseline of information for students interested in livestock or meat judging.

**AN\_SCI 2115. Livestock Judging. 3 Credits.**

Comparative judging and evaluation; various classes of farm animals; particular reference to utility. Reference reading; illustrated lectures. Prerequisite: AN\_SCI 1065.

**AN\_SCI 2131. Dairy Products Evaluation. 2 Credits.**

(same as F\_S 2131. Sensory Evaluation and judging of dairy products.

**AN\_SCI 2135. Horse Selection and Evaluation. 2 Credits.**

Techniques of selecting and evaluating horses based on conformation and performance characteristics. Effects of conformation on soundness. Includes learning to organize observations on the relative merits of a group of horses into an oral presentation. Prerequisite: AN\_SCI 1065.

**AN\_SCI 2140. Companion Animals. 3 Credits.**

(same as BIOMED 2140). Focus on companion dog, cat, and horse owners concerns re: health zoonoses, legal responsibilities, inbreeding, choice of breeds, behavioral problems and loss of companion animals. Prerequisite: sophomore standing.

**AN\_SCI 2165. Introduction to Ruminant Livestock Production. 3 Credits.**

This is an introductory theory course which provides fundamental understanding of ruminant livestock - beef cattle and dairy cattle, production, management and associate industries. Prerequisite: AN\_SCI 1065. Graded on A/F basis only.

**AN\_SCI 2175. Introduction to Monogastric Production. 3 Credits.**

Introductory course which provides fundamental understanding of hogs, horses and poultry. Prerequisite: AN\_SCI 1065. Graded on A/F basis only.

**AN\_SCI 2195. Equine Facility Management and Marketing. 3 Credits.**

Focuses on learning equine facility management through student care and management of the University's equine facility and breeding herd. Students also learn handling techniques for a wide variety of horses and gain experience in general equine facility maintenance. Students will be responsible for marketing horses sold in the annual MU online horse auction. Prerequisites: AN\_SCI 2135 and instructor's consent. Cannot be taken at the same time as AN\_SCI 2095. Graded on A-F basis only.

**AN\_SCI 3001. Topics in Animal Science. 1-4 Credit.**

Various courses offered on a preliminary basis to determine need for such offering prior to submission as a numbered course. Various topics, credit arranged. Prerequisite: department consent.

**AN\_SCI 3085. Problems in Animal Science. 1-6 Credit.**

Current problems in animal breeding, nutrition, livestock production and management, meats. Assigned topics. In some cases student may undertake a project by outlining objectives, planning work, keeping records and summarizing results in written report. Prerequisite: instructor's consent. Some sections may be graded either on S/U or A/F basis only.

**AN\_SCI 3190. Study Abroad: International Meat, Dairy and Enology. 3 Credits.**

(same as F\_S 3190). This study abroad course introduces students to the meat, dairy and wine industries in Germany or in New Zealand (destinations are on a rotational basis). Students will visit small, medium and large-scale producers and learn about differences in comparisons to the US industries. May be repeated once for credit. Prerequisite: instructor's consent.

**AN\_SCI 3212. Principles of Animal Nutrition. 3 Credits.**

The purpose of this course is to teach students the essential nutrients for animal life and to understand the basic principles of nutrition. Prerequisites: 1 course in biochemistry or at least 4 hours of chemistry and MATH 1100 or equivalent. Graded on A/F basis only.

**AN\_SCI 3213. Genetics of Agricultural Plants and Animals. 3 Credits.**

(same as PLNT\_S 3213). Concepts of molecular, transmission, and population and quantitative genetics. Special emphasis given to breeding and biotechnological applications in plant and animal agriculture. Prerequisites: BIO\_SC 1010, BIO\_SC 1020 or BIO\_SC 1500, MATH 1100.

**AN\_SCI 3214. Principles of Meat Science. 3 Credits.**

(same as F\_S 3214). Study of the principles involved in the conversion of living animals to meat and by-products; efficient utilization of meat as a food. Prerequisite: one course in Biology.

**AN\_SCI 3231. Principles of Dairy Foods Science. 3 Credits.**

(same as F\_S 3231). Technology, chemistry and microbiology related to milk and its transformation into fluid milk products, fermented dairy foods and spreads. (2 hours of lecture and two hours of laboratory per week.) Prerequisite: One course is Chemistry or Biological Sciences.

**AN\_SCI 3232. Animal Feeds and Feeding. 3 Credits.**

Description of feed ingredients, formulation of diets, and animal feeding management. Prerequisites: AN\_SCI 3212; MATH 1100 or equivalent.

**AN\_SCI 3254. Physiology of Domestic Animals. 3 Credits.**

Basic concepts of physiology and anatomy as related to domestic animals. Prerequisites: BIO\_SC 1010 and BIO\_SC 1020 or BIO\_SC 1500; CHEM 1310 and CHEM 1320.

**AN\_SCI 3255. Physiology of Domestic Animals Laboratory. 2 Credits.**

This laboratory course covers the basic concepts of physiology as related to domestic animals. Prerequisites: BIO\_SC 1010 and BIO\_SC 1020 or BIO\_SC 1500; CHEM 1310 and CHEM 1320; AN\_SCI 3254 or equivalent.

**AN\_SCI 3275. Meat Animal Evaluation. 2 Credits.**

Meat animal evaluation highlights the relationships and limitations that exist when evaluating market and breeding animals and develops an appreciation for carcass excellence as it relates to production, merchandising and consumption. Some travel time and commitments will be necessary. Prerequisites: AN\_SCI 2114 and AN\_SCI 2115.

**AN\_SCI 4001. Topics in Animal Science. 1-4 Credit.**

Various courses offered on a preliminary basis to determine need for such offering prior to submission as a numbered course. Various topics, credit arranged. Prerequisite: instructor's consent.

**AN\_SCI 4304. Processing Muscle Foods. 3 Credits.**

(same as Food Science [F\_S] 4344). Materials and technologies for the manufacture of muscle food products from red meats, poultry and seafood. Experience problem-solving through further processing of

complex ingredients and develop skills by practicing operations in a pilot plant facility. Prerequisites: One Chemistry course.

**AN\_SCI 4312. Monogastric Nutrition. 3 Credits.**

(same as NUTR\_S 4020). Principles of nutrition, feed formulation and recent research in poultry feeding. Prerequisites: AN\_SCI 3212. Graded on A/F basis only.

**AN\_SCI 4314. Physiology of Reproduction. 3 Credits.**

Principles of animal reproduction with emphasis on endocrine control of reproductive processes. Prerequisites: AN\_SCI 3254 and BIO\_SC 1500 or equivalent; or AN\_SCI 3254 as a co-requisite and instructor's consent.

**AN\_SCI 4323. Applied Livestock Genetics. 2 Credits.**

Genetic principles applied to improvement of farm animals. Covers selection, prediction of genetic merit and mating systems. Prerequisite: BIO\_SC 1010, BIO\_SC 1020 or BIO\_SC 1500 and MATH 1100. Math Reasoning Proficiency Course.

**AN\_SCI 4324. Genomics of Plants and Animals. 2 Credits.**

Analysis of organisms at the level of the complete genome sequence. Covers genome sequencing, assembly and annotation, as well as functional, evolutionary and computational genomics. Prerequisites: BIO\_SC 1010, BIO\_SC 1020 or BIO\_SC 1500, MATH 1100, AN\_SCI 3213 /PLNT\_S 3213 or equivalent.

**AN\_SCI 4332. Ruminant Nutrition. 3 Credits.**

Physiology, chemistry, microbiology and pathology of ruminants. Emphasizes the digestion, absorption, metabolism and utilization of nutrients. Prerequisite: AN\_SCI 3212.

**AN\_SCI 4354. Physiology and Biochemistry of Muscle as Food. 3 Credits.**

(same as F\_S 4354). Basic concepts in muscle growth and development of livestock evaluating the effects of environment, welfare, nutrition and genetics regarding muscle metabolism, physiology, and the ultimate condition of muscle as food. Prerequisite: BIO\_SC 1010 or equivalent or AN\_SCI 3214 or instructor's consent.

**AN\_SCI 4384. Reproductive Management. 3 Credits.**

Reproductive management of cattle, swine and sheep; estrous synchronization; artificial insemination; embryo development and transfer; assisted reproductive technologies. Prerequisites: senior standing and AN\_SCI 4314 and instructor's consent.

**AN\_SCI 4387. Equine Breeding Management. 5 Credits.**

Focuses on practical applications of reproductive management techniques and breeding in the horse. Topics include stallion collection and evaluation, artificial insemination, interpreting ultrasound images, teasing, parturition, and foal care. Students will gain hands-on experience in each of these areas. Prerequisites: AN\_SCI 2175 and AN\_SCI 4314; instructor's consent.

**AN\_SCI 4434. Molecular and Network Evolution. 3 Credits.**

Evolution of biological macromolecules and networks, including sequence analysis algorithms and theory, phylogenetics, gene duplication, genome evolution, principles of biological networks. Development of computational skills emphasized. Prerequisites: BIO\_SC 1500 and MATH 1100; instructor's consent.

**AN\_SCI 4437. Environmental Physiology. 3 Credits.**

Principles of environmental physiology and animal adaptation with emphasis on mechanisms of temperature regulation and related nutritional and metabolic-hormonal functions. Prerequisite: AN\_SCI 3254 or equivalent.

**AN\_SCI 4910. Senior Seminar in Captive Wild Animal Management. 1 Credit.**

(same as F\_W 4910). Investigates key issues in captive wild animal management, focusing on the role of animal caretakers in addressing the issues. Students are required to formulate informed opinions regarding these topics and communicate effectively about the subject matter. Prerequisite: AN\_SCI 1012 or F\_W 1012 or instructor's consent; junior or senior standing. Graded A-F only.

**AN\_SCI 4940. Internship in Animal Science & Technology. 1-12 Credit.**

Off-campus training to develop technical skills and understanding of an area of animal science. Written reports required. Prerequisites: instructor's consent. Graded on an S/U basis only.

**AN\_SCI 4950. Undergraduate Research in Animal Science. 1-3 Credit.**

Individually directed field or laboratory research culminating in a poster or oral presentation for upper-class students under faculty supervision. Prerequisites: At least sophomore standing or instructor's consent.

**AN\_SCI 4973. Molecular and Cellular Techniques in Animal Science. 4 Credits.**

A directed research project that employs current molecular and cellular technologies. Students will generate experimental data, analyze the data and draft a research report in the format of a scientific paper. Prerequisites: an introductory course in biology and a course in organic chemistry, at least junior standing and instructor's consent.

**AN\_SCI 4975. Beef Production and Management. 3 Credits.**

Systems of beef production: breeding, feeding, management of commercial and purebred beef cattle. Prerequisites: AN\_SCI 1065, AN\_SCI 2165 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 4976. Dairy Production. 3 Credits.**

Applied dairy science; emphasis on nutrition and management; herd health, labor-saving equipment, buildings, quality products, organization of dairy enterprise, business and economic aspects. Prerequisites: AN\_SCI 1065, AN\_SCI 2165, AN\_SCI 3212, and AN\_SCI 3232 or instructor's consent.

**AN\_SCI 4977. Horse Production. 3 Credits.**

Systems of horse production: breeding, feeding and management of horses. Prerequisites: AN\_SCI 1065, AN\_SCI 2175 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 4978. Swine Production. 3 Credits.**

Systems of pork production: breeding, feeding, management of commercial and purebred swine. Prerequisites: AN\_SCI 1065, AN\_SCI 2175 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 4979. Poultry Production. 3 Credits.**

Principles of housing systems, nutrition, management, business and production of commercial chickens and turkeys. Prerequisites: AN\_SCI 1065, AN\_SCI 2175 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 7001. Topics in Animal Science. 1-4 Credit.**

Various courses offered on a preliminary basis to determine need for such offering prior to submission as a numbered course. Various topics, credit arranged. Prerequisite: instructor's consent.

**AN\_SCI 7312. Monogastric Nutrition. 3 Credits.**

(same as NUTRIT 7020 and NUTR\_S 7020). Principles of nutrition, feed formulation and recent research in poultry feeding. Prerequisites: graduate standing and AN\_SCI 3212. Graded on A/F basis only.

**AN\_SCI 7314. Physiology of Reproduction. 3 Credits.**

Principles of animal reproduction with emphasis on endocrine control of reproductive processes. Prerequisites: graduate standing and Animal Science AN\_SCI 3254 and Biological Sciences BIO\_SC 1500 or equivalent; or AN\_SCI 3254 as a co-requisite and instructor's consent.

**AN\_SCI 7323. Applied Livestock Genetics. 2 Credits.**

Genetic principles applied to improvement of farm animals. Covers selection, prediction of genetic merit and mating systems. Prerequisite: graduate standing and BIO\_SC 1010, BIO\_SC 1020 or BIO\_SC 1500 and MATH 1100.

**AN\_SCI 7324. Genomics of Plants and Animals. 3 Credits.**

Analysis of organisms at the level of the complete genome sequence. Covers genome sequencing, assembly and annotation, as well as functional, evolutionary and computational genomics. Prerequisites: BIO\_SC 1010, BIO\_SC 1020 or BIO\_SC 1500, MATH 1100, AN\_SCI 3213 /PLNT\_S 3213 or equivalent; graduate students may enroll with instructor's consent.

**AN\_SCI 7332. Ruminant Nutrition. 3 Credits.**

Physiology, chemistry, microbiology and pathology of ruminants. Emphasizes the digestion, absorption, metabolism and utilization of nutrients. Prerequisites: graduate standing and AN\_SCI 3212.

**AN\_SCI 7344. Processing Muscle Foods. 3 Credits.**

(same as F\_S 7344). Materials and technologies for the manufacture of muscle food products from red meats, poultry and seafood. Experience problem-solving through further processing of complex ingredients and develop skills by practicing operations in a pilot plant facility. Prerequisites: one Chemistry course.

**AN\_SCI 7354. Physiology and Biochemistry of Muscle as Food. 3 Credits.**

(same as F\_S 7354). Basic concepts in muscle growth and development of livestock evaluating the effects of environment, welfare, nutrition and genetics regarding muscle metabolism, physiology, and the ultimate condition of muscle as food. Prerequisite: graduate standing and BIO\_SC 1010 or equivalent or AN\_SCI 3214 or instructor's consent.

**AN\_SCI 7384. Reproductive Management. 3 Credits.**

Reproductive management of cattle, swine and sheep; estrous synchronization; artificial insemination; embryo development and transfer; assisted reproductive technologies. Prerequisites: graduate standing and AN\_SCI 4314 and instructor's consent.

**AN\_SCI 7434. Molecular and Network Evolution. 3 Credits.**

Evolution of biological macromolecules and networks, including sequence analysis algorithms and theory, phylogenetics, gene duplication, genome evolution, principles of biological networks. Development of computational skills emphasized. Instructor's consent required.

**AN\_SCI 7437. Environmental Physiology. 3 Credits.**

Principles of environmental physiology and animal adaptation with emphasis on mechanisms of temperature regulation and related nutritional and metabolic-hormonal functions. Prerequisite: graduate standing and AN\_SCI 3254 or equivalent.

**AN\_SCI 7975. Beef Production and Management. 3 Credits.**

Systems of beef production: breeding, feeding, management of commercial and purebred beef cattle. Prerequisites: graduate standing and AN\_SCI 1065, AN\_SCI 2165 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 7976. Dairy Production. 3 Credits.**

Applied dairy science; emphasis on nutrition and management; herd health, labor-saving equipment, buildings, quality products, organization of dairy enterprise, business and economic aspects. Prerequisites: graduate standing and AN\_SCI 1065, AN\_SCI 2165, AN\_SCI 3212 and AN\_SCI 3232 or instructor's consent.

**AN\_SCI 7977. Horse Production. 3 Credits.**

Systems of horse production: breeding, feeding and management of horses. Prerequisites: graduate standing and AN\_SCI 1065, AN\_SCI 2175 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 7978. Swine Production. 3 Credits.**

Systems of pork production: breeding, feeding, management of commercial and purebred swine. Prerequisites: graduate standing and AN\_SCI 1065, AN\_SCI 2175 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 7979. Poultry Production. 3 Credits.**

Principles of housing systems, nutrition, management, business and production of commercial chickens and turkeys. Prerequisites: graduate standing and AN\_SCI 1065, AN\_SCI 2175 and AN\_SCI 3212 or instructor's consent.

**AN\_SCI 8085. Problems in Animal Science. 1-6 Credit.**

Advanced independent studies in fields not directly related to thesis or non-thesis degree research program. Prerequisites: instructor's consent. Graded on S/U or A/F basis only.

**AN\_SCI 8087. Seminar in Animal Science. 1 Credit.**

Critical consideration of research and other selected subjects in animal breeding, animal nutrition, reproductive physiology, growth and development and livestock production and management.

**AN\_SCI 8090. Thesis Research in Animal Science. 1-99 Credit.**

Investigations in animal breeding, animal nutrition, reproduction physiology, growth and development livestock production and management. Graded on a S/U basis only.

**AN\_SCI 8413. Reproductive Biology Seminar. 1 Credit.**

Presentation and discussion of selected topics from all phases of reproductive biology. Open to qualified students of graduate standing in the field of Reproductive Biology.

**AN\_SCI 8414. Meat Quality. 3 Credits.**

(same as F\_S 8414). Discussion of factors affecting meat quality in beef, pork, lamb and poultry. Prerequisites: AN\_SCI 3214 or equivalent. Graded on A/F basis only.

**AN\_SCI 8415. Survey of Epigenetics. 3 Credits.**

This course will introduce graduate students to the basic concepts in epigenetics, including DNA methylation, histone modifications, epigenetic modifiers/transacting factors, non-coding RNAs, genomic imprinting, and dosage compensation. The courses designed to be a combination of lectures, paper discussions, and research talks by invited faculty speakers from across campus. Prerequisite: graduate standing and instructor's consent.

**AN\_SCI 8420. Endocrinology. 3 Credits.**

Hormones of pituitary and endocrine glands; special reference to influence on growth, reproduction, milk secretion. Prerequisite: AN\_SCI 7314 or equivalent.

**AN\_SCI 8424. Meat Investigations. 3 Credits.**

(same as F\_S 8424). Discussions of scientific literature and hands-on experimentation with research techniques customarily used in the field

of meat science. Graded on A/F basis only. Prerequisites: F\_S 3214 / AN\_SCI 3214 or equivalent; instructor's consent.

**AN\_SCI 8431. Nutritional Biochemistry of Lipids. 3 Credits.**  
(Same as NUTR\_S 8310 and NUTRIT 8310). Current concepts in the nutritional regulations of lipid metabolism. Emphasis on integrating information and interpreting current research data. Prerequisites: BIOCHM 4270 and BIOCHM 4272.

**AN\_SCI 8438. Nutrient Regulation of Gene Expression. 3 Credits.**  
(same as NUTRIT 8438, NUTR\_S 8438 and BIOCHM 8438). This second semester of the graduate nutritional sciences core curriculum will cover nutritional biochemistry of minerals and on research literature, with an emphasis on in-depth coverage of several minerals that illustrate emerging themes in mineral nutritional biochemistry and nutrient regulation of gene expression. The course will be taught in tutorial format. Prerequisites: BIOCHM 4270 and BIOCHM 4272 and 1st semester Graduate Nutrition core curriculum.

**AN\_SCI 8441. Livestock Production and Management Research Methods. 3 Credits.**

Techniques of experimentation, with application to livestock production and management. Exercises in methods of planning, conducting, analyzing, evaluating and reporting research. Prerequisites: STAT 4530/7530 or equivalent or instructor's consent.

**AN\_SCI 8443. Functional Genomics of Mammalian Genomes: Focus on Microarray. 4 Credits.**

The curriculum covers methods for functional genomics. It explores experimental designs, data filtering, ANOVA analysis, power calculations, clustering and classification systems, and functional annotation of genes through lectures, and bioinformatics and regular laboratories. Prerequisites: BIO\_SC 4974 and BIO\_SC 4374 or equivalent courses, Anova analysis course (STAT 7530) or equivalent experience in using Anova analysis. May be repeated for credit. Graded on A/F basis only.

**AN\_SCI 8447. Recent Advances in Environmental and Endocrine Physiology. 1 Credit.**

Seminar. Presentation, discussion, and critical evaluation of current status of selected topics in environmental and endocrine physiology. Prerequisite: AN\_SCI 3254 or equivalent.

**AN\_SCI 8450. Research in Animal Science. 1-99 Credit.**  
Research in Animal Science.

**AN\_SCI 8472. Amino Acid Metabolism. 2 Credits.**

An in-depth study of amino acid metabolism and their relationship to animal nutrition. Prerequisites: BIOCHM 4270 and BIOCHM 4272.

**AN\_SCI 8725. Science Outreach: Public Understanding of Science. 1-2 Credit.**

(same as BIO\_SC 8725, PHYSCS 8350 and LTC 8725). Development of presentations to adult audiences on the science underlying issues of current interest. May be repeated for credit.

**AN\_SCI 9001. Topics in Animal Science. 1-99 Credit.**  
Prerequisites: instructor's consent.

**AN\_SCI 9090. Dissertation Research in Animal Science. 1-99 Credit.**  
Investigations in animal breeding, animal nutrition, livestock production and management. Dissertation required. Graded on a S/U basis only.

**AN\_SCI 9423. Genetics of Populations. 4 Credits.**  
Introduction to quantitative genetics with application to animal and plant breeding. Prerequisite: STAT 4530/7530.

**AN\_SCI 9432. Ruminant Nutrition. 3 Credits.**

(same as NUTRIT 8320). Physiology, chemistry, microbiology, pathology of ruminants. Emphasizes digestion, absorption, metabolism, utilization of nutrients. Lecture, laboratory, assigned readings. Prerequisite: AN\_SCI 4332/7332 or equivalent and BIOCHM 4270.

**AN\_SCI 9433. Gamete and Embryo Development. 3 Credits.**

A classical and molecular approach to spermatogenesis, oogenesis, fertilization and preimplantation development in the domestic species. Prerequisites: AN\_SCI 4314/7314 or BIO\_SC 4984 or equivalent.

**AN\_SCI 9434. Gonadal Function. 3 Credits.**

(same as Biomedical Science [BIOMED] 9434). Prerequisite: Animal Sciences [AN\_SCI] 4314, biochemistry or cell biology and AN\_SCI 8420.

**AN\_SCI 9441. Bioenergetics. 3 Credits.**

(same as NUTRIT 8400). Energetic interactions of animals and their physical and nutritional environments. Prerequisite: instructor's consent.

**AN\_SCI 9442. Vitamins and Minerals. 4 Credits.**

Designed to provide students with an understanding of the chemical, metabolic, and functional role of vitamins and minerals in nutrition. While the primary focus will be on animals, comparative aspects to human nutrition will be discussed. Prerequisites: AN\_SCI 3212, BIOCHM 4270 or equivalent.

**AN\_SCI 9452. Mycotoxins. 3 Credits.**

Designed to provide students with an understanding of the occurrence of mycotoxins, mechanisms of toxicity, analytical methodology, and approaches for ameliorating the toxic effects of mycotoxin in animals. Consent of instructor required. Graduate standing required. Courses in Nutrition and Biochemistry.

## Anthropology (ANTHRO)

**ANTHRO 1000. General Anthropology. 3 Credits.**

General survey course in fields of anthropological concern: archaeology, cultural anthropology, physical anthropology, linguistics; emphasizes underlying concepts, principles. Examples from peoples of the world.

**ANTHRO 1000H. General Anthropology - Honors. 3 Credits.**

General survey course in fields of anthropological concern: archaeology, cultural anthropology, physical anthropology, linguistics; emphasizes underlying concepts, principles. Examples from peoples of the world. Honors eligibility required.

**ANTHRO 1001. Topics in Anthropology - General. 3 Credits.**

Problems, topics, issues, or review of research in any areas of anthropology and/or experimental development of new content areas at a freshman level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 1002. Topics in Anthropology - Biological/Physical/Mathematics. 1-3 Credit.**

Problems, topics, issues, or review of research in any areas of anthropology and/or experimental development of new content areas at a freshman level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 1003. Topics in Anthropology - Behavioral. 3 Credits.**

Problems, topics, issues, or review of research in any areas of anthropology and/or experimental development of new content areas at a freshman level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 1004. Topics in Anthropology - Social Science. 3 Credits.**

Problems, topics, issues, or review of research in any areas of anthropology and/or experimental development of new content areas at a freshman level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 1005. Topics in Anthropology - Humanities. 3 Credits.**

Problems, topics, issues, or review of research in any areas of anthropology and/or experimental development of new content areas at a freshman level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 1060. Human Language. 3 Credits.**

(same as LINGST 1060, C\_S\_D 1060 and ENGLSH 1060). General introduction to various aspects of linguistic study. Elementary analysis of language data with some attention to application of linguistic study to other disciplines.

**ANTHRO 1150. Introduction to Folklore Genres. 3 Credits.**

(same as ENGLSH 1700). Course focus is on genres of folklore in both historic and contemporary contexts, as well as in people's daily lives. Genres include narrative, proverbs, oral poetry and rhyme, riddles, jokes, legends, epics, material culture and intangible expressive culture. Graded on A/F basis only.

**ANTHRO 1200. Significant Discoveries of Archaeology. 3 Credits.**

Detailed consideration of approximately 20 archaeological discoveries and conclusions, from the field and the laboratory, which have been of surpassing importance for an understanding of human origins, behavior, culture and past experiences on earth.

**ANTHRO 1300. Multiculturalism: An Introduction. 3 Credits.**

Examines contemporary multiculturalism (and its origins) globally; introduces key concepts; uses diverse, extended cross-cultural and American examples; and emphasizes complexity of cultures, practicality of issues, and change.

**ANTHRO 1350. Deviance: A Cross-Cultural Perspective. 3 Credits.**

Cross-cultural studies of problem behavior with emphasis on violence, suicide, sexual misconduct, drug use and mental disorder.

**ANTHRO 1500. Monkeys, Apes and Humans. 3 Credits.**

For those with little or no background in anthropology. Surveys the ecology and behavior of major nonhuman primate groups, and how these relate to the evolution of human behavior.

**ANTHRO 2001. Topics in Anthropology-General. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology (including its relationships with other areas) and/or experimental development of new content areas at an undergraduate level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 2002. Topics in Anthropology-Biological/Physical/Mathematics. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology (including its relationships with other areas) and/or experimental development of new content areas at an undergraduate level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 2003. Topics in Anthropology - Behavioral. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology (including its relationships with other areas) and/or experimental development of new content areas at an undergraduate

level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 2004. Topics in Anthropology - Social Science. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology (including its relationships with other areas) and/or experimental development of new content areas at an undergraduate level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 2005. Topics in Anthropology - Humanities. 1-3 Credit.**

Problems, topics, issues or review of research in any area of anthropology (including its relationships with other areas) and/or experimental development of new content areas at an undergraduate level. Specific content will vary and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 2020. Fundamentals of Archaeology with Laboratory. 4 Credits.**

Introduces the methodological and theoretical underpinnings of archaeology. The goals of archaeological research, and the techniques used to extract data from the archaeological record are discussed. The lab involves hands-on experience with archaeological materials. Prerequisites: sophomore standing recommended. No credit for both ANTHRO 2020 and 2021.

**ANTHRO 2021. Fundamentals of Archaeology. 3 Credits.**

Introduces the methodological and theoretical underpinnings of archaeology. The goals of archaeological research, and the techniques used to extract data from the archaeological record are discussed. Prerequisites: sophomore standing recommended. No credit for both ANTHRO 2020 and 2021.

**ANTHRO 2022. Fundamentals of Archaeology Lab. 1 Credit.**

Involves hands-on experience with archaeological materials. Prerequisite: must have completed ANTHRO 2021. No credit given to students who have taken ANTHRO 2020.

**ANTHRO 2030. Cultural Anthropology. 3 Credits.**

Analysis of human cultures with emphasis on both constant and variable factors at different levels of social complexity; contact between cultures, and cultural influences on individual behavior. Prerequisites: sophomore standing recommended.

**ANTHRO 2040. Anthropological Linguistics. 3 Credits.**

(same as LINGST 2040). Language in relation to other aspects of human behavior. Introduction to description and analysis of the basic units of language. Emphasis on non-Indo-European and preliterate languages. Prerequisites: sophomore standing recommended.

**ANTHRO 2050. Introduction to Biological Anthropology with Laboratory. 5 Credits.**

A survey of biological anthropology. Primary emphasis on the biological evidence for human evolution. Major topics include human paleontology, primate behavior and human variation. Three hours lecture and two hours lab. Prerequisite: Math [MATH] 1100/1120; sophomore standing recommended. No credit for both Anthropology [ANTHRO] 2050 and 2051. Math Reasoning Proficiency Course.

**ANTHRO 2051. Introduction to Biological Anthropology. 3 Credits.**

A survey of biological anthropology. Primary emphasis on the biological evidence for human evolution. Major topics include human paleontology, primate behavior and human variation. Prerequisite: sophomore standing recommended. No credit for both ANTHRO 2050 and 2051.

**ANTHRO 2052. Biological Anthropology Laboratory. 2 Credits.**

Laboratory exercises dealing with human genetics, non-human primates, the human fossil record, and human variation. Prerequisites: ANTHRO 2051 or equivalent and MATH 1100/1120. Credit not given for students who have taken ANTHRO 2050. Math Reasoning Proficiency Course.

**ANTHRO 2100. Indigenous Religions. 3 Credits.**

(same as REL\_ST 2100). Explores the central aspects of religious life in indigenous communities. Focusing on specific native communities, it considers individual and group identity and the meaning of the sacred.

**ANTHRO 2100H. Indigenous Religions - Honors. 3 Credits.**

(same as REL\_ST 2100H). Explores the central aspects of religious life in indigenous communities. Focusing on specific native communities, it considers individual and group identity and the meaning of the sacred. Honors eligibility required.

**ANTHRO 2150. Introduction to Folklore Field Research. 3 Credits.**

(same as ENGLSH 2700). Course will focus on the specifics of how to identify, collect, preserve and document folklore within communities. Prerequisite: ENGLSH 1000.

**ANTHRO 2215. World Archaeology. 3 Credits.**

Major events in cultural evolution such as control of fire, invention of ceramic and metallurgical technologies, colonization of Australia and the Americas, development of agriculture, and emergence of complex sociopolitical organization are described in all regions of the world. Prerequisite: sophomore standing recommended.

**ANTHRO 2300. Anthropology of War. 3 Credits.**

Anthropological approaches to tribal and modern war; theories of war's origins; relation to ecology, economy, gender, belief systems, politics; transformation of tribal warfare by state expansion; peace. Prerequisite: sophomore standing recommended.

**ANTHRO 2340. Hunters and Gatherers. 3 Credits.**

Exploration of how different hunter-gatherer groups interact with their physical and social environment. Topics include food acquisition, allocation of labor, reproduction and family life, and deciding where to live and when to move. Prerequisite: sophomore standing recommended.

**ANTHRO 2500. Primate Anatomy and Evolution. 3 Credits.**

This course will explore why primates (and humans) are built the way they are, how they evolved, and what their anatomy tells us about their biology. We will cover basic primate anatomy and ecology, and then survey the fossil record of primate evolution. Prerequisite: sophomore standing recommended.

**ANTHRO 2520. Forensic Anthropology. 3 Credits.**

This course will introduce students to how biological anthropologists apply expertise in human osteology, skeletal variation and plasticity, skeletal pathology, body decomposition, and archaeological recovery of evidence to medicolegal investigations. Prerequisite: sophomore standing recommended.

**ANTHRO 2570. Parents and Offspring. 3 Credits.**

A comparative investigation of the evolution of parental behaviors and family interactions in humans and other primates. Prerequisite: sophomore standing recommended.

**ANTHRO 2580. Evolution of Human Sexuality. 3 Credits.**

Biological and cultural aspects of human reproduction are examined from the perspective of evolutionary and ecological theory. Prerequisite: sophomore standing recommended.

**ANTHRO 2800. Introduction to Field Methods in Archaeology. 1-6 Credit.**

Techniques of field research and laboratory analysis through field experience. Prerequisite: ANTHRO 2020/2021 or instructor's consent.

**ANTHRO 2825. Analyzing Artifacts. 3 Credits.**

A brief introduction to the main methods used to analyze artifacts.

**ANTHRO 2950. Research Skills in Anthropology. 1-3 Credit.**

Participation in faculty research activities. Course coordinator matches students with participating faculty. Three hours of research activities per week per credit hour. May be repeated to a maximum of nine hours. Prerequisite: instructor's consent.

**ANTHRO 3001. Topics in Anthropology - General. 3 Credits.**

Problems, topics, issues, or review of research in any area of anthropology and/or experimental development of new content areas. May be repeated to a maximum of 9 hours.

**ANTHRO 3002. Topics in Anthropology-Biological/Physical/Mathematics. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology and/or experimental development of new content areas. May be repeated to a maximum of 9 hours.

**ANTHRO 3003. Topics in Anthropology - Behavioral Science. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology and/or experimental development of new content areas. May be repeated to a maximum of 9 hours.

**ANTHRO 3004. Topics in Anthropology - Social Science. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology and/or experimental development of new content areas. May be repeated to a maximum of 9 hours.

**ANTHRO 3005. Topics in Anthropology - Humanities. 3 Credits.**

Problems, topics, issues or review of research in any area of anthropology and/or experimental development of new content areas. May be repeated to a maximum of 9 hours.

**ANTHRO 3150. American Folklore. 3 Credits.**

(same as ENGLSH 3700). Regional and ethnic American folklore, with emphasis on analysis of folklore in context. Book reports and two analytical papers based on student field research required.

**ANTHRO 3380. Native American Religions. 3 Credits.**

(same as REL\_ST 3380). Investigation of religious lives of the native peoples of the Americas through cultural contact with modernity. Perspectives based on historical, anthropological and native texts.

**ANTHRO 3380H. Native American Religions - Honors. 3 Credits.**

(same as REL\_ST 3380H). Investigation of religious lives of the native peoples of the Americas through cultural contact with modernity. Perspectives based on historical, anthropological and native texts. Honors eligibility required.

**ANTHRO 3470. Culture as Communication. 3 Credits.**

(same as COMMUN 3470, LINGST 3470). Study of the influence of culture on communication processes. Examines topics such as the impact of values, languages, and nonverbal behavior on intercultural interaction. Prerequisites: sophomore standing.

**ANTHRO 3540. Human Biology and Life History. 3 Credits.**

A general survey of human biology, focusing on the development of the individual from infancy to adult and the biology of human populations. Prerequisites: one course in Anthropology or Biological Sciences.

**ANTHRO 3560. Plagues and Peoples. 3 Credits.**

Overview of the ecology of human host-pathogen interactions and the influence of human culture on the transmission and spread of infectious diseases through time and in different environments. Prerequisite: sophomore standing or instructor's consent.

**ANTHRO 3600. North American Indian Culture. 3 Credits.**

Comparative study of American Indians north of Mexico, emphasizes eastern United States.

**ANTHRO 3610. Peoples of Canada. 3 Credits.**

This course provides an anthropological approach to the culture and peoples of Canada. The course will include in depth studies of several First Nations People, Quebec, various recent immigrant populations, and the modern popular culture of Canada.

**ANTHRO 3650. Aztec, Maya, and Inca Civilization. 3 Credits.**

Origin of native Americans and development of American civilizations emphasizing Aztecs, Mayas, and Incas; rise of these civilizations known from archaeology, early European and early native American accounts, and the condition of the descendants today. Prerequisite: sophomore standing.

**ANTHRO 3660. Peoples of the Andes. 3 Credits.**

Archaeological and linguistic prehistory set the stage for the clash of Iberian and indigenous peoples whose descendants make up the Andean countries. Ethnographic studies provides a basis for their understanding. Prerequisite: sophomore standing.

**ANTHRO 3680. Plants and People in Native America. 3 Credits.**

Explores the present and past interactions between people and the plant world, covering use of plants as foods, medicines, and in rituals, and reviewing the origin of major food plants. Prerequisite: sophomore standing.

**ANTHRO 3700. Cultures of Europe. 3 Credits.**

Examines ethnic, linguistic, and folk cultural backgrounds of contemporary Europe and the articulation of local sociocultural units with national society and culture. Prerequisite: sophomore standing or instructor's consent.

**ANTHRO 3780. Cultures of Southeast Asia. 3 Credits.**

Survey of peoples and cultures of Southeast Asia; topics include regional geography and prehistory, European colonialism, economic and social organization, religious practices, changing status of women, urban and rural poverty, and environmental transformations.

**ANTHRO 4001. Topics in Anthropology-General. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new content areas. Specific content varies depending on needs of faculty or students and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 4002. Topics in Anthropology - Biological/Physical/Mathematics. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new content areas. Specific content varies depending on needs of faculty or students and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 4003. Topics in Anthropology - Behavioral Science. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new content areas. Specific content varies depending on

needs of faculty or students and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 4004. Topics in Anthropology - Social Science. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new content areas. Specific content varies depending on needs of faculty or students and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 4005. Topics in Anthropology - Humanities. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new content areas. Specific content varies depending on needs of faculty or students and will be announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 4150. Special Themes in Folklore. 3 Credits.**

(same as ENGLISH 4700). Intensive study in a selected area of folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature, or the folklore of a particular group. May be repeated for a maximum of six hours with department's consent.

**ANTHRO 4160. Themes in African Diaspora Folklore. 3 Credits.**

(same as ENGLISH 4710 and BL\_STU 4710). Intensive study in a selected area of African Diaspora Folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature, or the folklore of a particular group. ANTHRO 4150 and 4160 may be repeated for a maximum of six hours with instructor's consent. Prerequisite: junior standing.

**ANTHRO 4200. Environment and Archaeology. 3 Credits.**

Study of Quaternary environments and cultural systems. Focuses on North American records emphasizing climate and biologic components of regional ecosystems; regional environmental reconstruction. Prerequisite: Anthropology ANTHRO 2020/2021 or instructor's consent.

**ANTHRO 4240. History of Archaeology. 3 Credits.**

Growth of archaeology worldwide since AD 1700. Emphases include intellectual and theoretical developments, field and laboratory techniques, and major figures in the history of the discipline. Prerequisites: Anthropology ANTHRO 2020/2021 or instructor's consent.

**ANTHRO 4280. Archaeology of Religion. 3 Credits.**

(same as REL\_ST 4280). Examines how anthropologists conceptualize religious behavior, and how archaeologists use material remains to examine past religious behavior, rituals, religious practitioners, cosmological constructs, worldview and ideology in the Americas. Prerequisites: ANTHRO 2020 and/or REL\_ST 2100.

**ANTHRO 4300. Comparative Social Organization. 3 Credits.**

Cross-cultural comparison, analysis of social structures. Role of kinship, age, sex, locality, economics, religion and other factors in determining relationships between individuals and groups cross-culturally. Prerequisites: ANTHRO 2030 or instructor's consent.

**ANTHRO 4320. Ecological and Environmental Anthropology. 3 Credits.**

Cultural anthropological approaches to human-environment interaction; cultural adaptations to diverse environments; theoretical developments and current issues; cultural, social, and historical contexts of natural resource use. Prerequisites: junior or senior standing or instructor's consent.

**ANTHRO 4340. Cultural Evolution and Change. 3 Credits.**

Alternative hypotheses about the relationship between culture and evolution are evaluated in light of ethnographic evidence. Prerequisites: ANTHRO 2030 or instructor's consent.

**ANTHRO 4350. Psychological Anthropology. 3 Credits.**

Examines cross-cultural approaches to the study of perception, cognition, and personality; methods for gathering and validating data; examples from non-Western societies.

**ANTHRO 4360. Medical Anthropology. 3 Credits.**

Cross-cultural study of belief systems concerning health and illness, practices of diagnosis and treatment, and roles of patients and practitioners. Several non-Western health care systems are studied in detail. Prerequisite: junior/senior standing or instructor's consent.

**ANTHRO 4370. Anthropology of Gender. 3 Credits.**

(same as WGST 4370). The Anthropology of Gender introduces the student to the variation in the relationships between male and females; and between men, women, and other genders from around the world. The different approaches to understanding and modeling gender are discussed, as are specific case-studies from many different cultures.

**ANTHRO 4380. Anthropological Theories of Religion. 3 Credits.**

(same as REL\_ST 4380). Course provides a critical evaluation of anthropological explanations of various forms of traditional religious behavior such as magic, shamanism, divination, ritual, mythology, and witchcraft. The anthropological explanations examined range from nineteenth century classics to the current approaches of today. Prerequisites: Anthropology [ANTHRO] 2030, Anthropology [ANTHRO] or Religious Studies [REL\_ST] 2100, or instructor's consent.

**ANTHRO 4400. Language and Culture. 3 Credits.**

(same as LINGST 4400). Interrelations between language, thought, culture, and society; role of language in cognition; methods and concepts of linguistics in cultural analysis. Prerequisite: ANTHRO 2040 or LINGST 2040 or instructor's consent.

**ANTHRO 4412. Gender, Language, and Communication. 3 Credits.**

(same as COMMUN 4412 and LINGST 4412). Relationship among gender, language, nonverbal communication, and culture. Prerequisite: junior standing or departmental consent.

**ANTHRO 4420. Historical Linguistics. 3 Credits.**

(same as LINGST 4420). Methods of tracing the history of languages by glottochronology, and by comparative and internal reconstructions; cultural and linguistic implications of such reconstructions and of areal linguistics. Prerequisites: junior/senior standing or instructor's consent.

**ANTHRO 4500. Human Origins. 5 Credits.**

History and theory in the study of human paleontology. Prerequisites: ANTHRO 2050/2052 or instructor's consent.

**ANTHRO 4540. Human Biological Variation. 3 Credits.**

Human biological variation both among and within living populations. Evolutionary, genetic, ecological, demographic and especially cultural factors which contribute to biological variation. Prerequisites: ANTHRO 2050/2051 or BIO\_SC 1010 and MATH 1100/1120.

**ANTHRO 4560. Anthropological Genetics. 3 Credits.**

Population genetics theory and methods applied to human and primate evolution and variation. Prerequisites: Anthropology [ANTHRO] 2050 or 2051 and 2052, or Biological Science [BIO\_SC] 1500, or instructor's consent.

**ANTHRO 4580. Evolutionary Medicine. 3 Credits.**

Principles of modern evolutionary theory are applied to medical problems. Topics include: function of symptoms (fever, nausea, etc.); strategies of pathogens; senescence; cancer; phylogenetic constraints; mental disorders. Ideas will be actively discussed in class. Prerequisites: lower

level course in Biology or Biological Anthropology, junior/senior standing or instructor's consent.

**ANTHRO 4600. Ethnographic Studies of Selected Cultures. 3 Credits.**

Specific content varies with student interest, faculty availability. Will concentrate on peoples and cultures of one area such as East Asia, South Asia, Africa, North America, Mesoamerica, Oceania, Europe. Amplifies ethnographic knowledge gained in lower-level survey courses. Prerequisites: junior standing or instructor's consent.

**ANTHRO 4620. North American Archaeology. 3 Credits.**

Ancient peoples and development of American Indian culture. Prerequisites: ANTHRO 2020/2021 or instructor's consent.

**ANTHRO 4640. Prehistory of the Greater Southwest. 3 Credits.**

The course will introduce students to the archaeology of aboriginal peoples of the American Southwest and northwestern Mexico. The emphasis will be on prehistoric culture development from the Paleoindians to the arrival of the Spanish. Ethnographic and modern peoples will be discussed as well. Prerequisites: ANTHRO 2020/2021.

**ANTHRO 4650. Prehistory of Mesoamerica. 3 Credits.**

Archaeology and prehistory of Mesoamerica (Mexico and Northern Central America). Emphasis on archaeological evidence for development of human societies from late Pleistocene hunting bands to complex agricultural civilizations encountered by Europeans in 1500s.

**ANTHRO 4670. Archaeology of South America. 3 Credits.**

Development of culture in South America from the Pleistocene to European contact. Prerequisites: ANTHRO 2020/2021, or junior/senior standing.

**ANTHRO 4680. Cultures and Peoples of the Amazon. 3 Credits.**

Ethnographic survey of indigenous Amazonian cultures. Junior Standing Required.

**ANTHRO 4700. Old World Prehistory. 3 Credits.**

Beginnings of culture in the Old World through the early Iron Age. Prerequisites: ANTHRO 2020/2021, or instructor's consent.

**ANTHRO 4720. Mesolithic, Neolithic, and Bronze Age Archaeology. 3 Credits.**

Analysis of both hunter-gatherer and food-producing prehistoric sociocultural systems in western Eurasia and adjacent areas from the end of the Pleistocene until the development of iron metallurgy. Includes the symbolic material of these periods. Prerequisites: junior/senior standing or instructor's consent.

**ANTHRO 4740. Celtic and Iron Age Archaeology. 3 Credits.**

Analysis of the pre-and protohistoric sociocultural systems of the Celts and other iron-using tribal cultures of western Eurasia from the inception of an iron based technology until the full historic period. Includes the symbolic material of these cultures. Prerequisites: junior/senior standing or instructor's consent.

**ANTHRO 4770. Asiatic Prehistory. 3 Credits.**

Prehistory and early cultures of Asia excluding the Near East. Emphasis on Northern Asia, China, Japan, South and Southeast Asia and Oceania. Prerequisites: junior/senior standing or instructor's consent.

**ANTHRO 4790. Culture and Society in South Asia. 3 Credits.**

(same as S\_A\_ST 4790). Survey of the cultures, social organizations, and lived experience of people from across the Indian subcontinent. Major topics include cast, kinship, gender, religion, village life,



urbanization, public culture, popular culture, social change, and the South Asian diaspora. Prerequisite: junior standing.

**ANTHRO 4800. Field Methods in Archaeology. 1-8 Credit.**

Techniques of archaeological excavation; field surveying, recording, care and interpretation of materials. Prerequisites: ANTHRO 2800 or equivalent.

**ANTHRO 4810. Paleoethnobotany. 3 Credits.**

Application of ethnobotanical approaches in archaeology; techniques to recover and interpret floral remains (macroremains, phytoliths, pollen); research questions in ethnobotany; integration of ethnobiological and archaeological data. Critique of original works in the field emphasized. Prerequisites: junior/senior standing or instructor's consent.

**ANTHRO 4820. Zooarchaeology. 3 Credits.**

Survey of specialized techniques for archaeological faunal analysis, including zooarchaeological sampling, taphonomy, study of paleoecology, and recognition of domestication. Prerequisites: ANTHRO 2020/2022 or instructor's consent.

**ANTHRO 4826. Stone Artifact Analysis. 3 Credits.**

Theory, methods, and techniques of studying lithic artifacts and deriving culturally meaningful interpretations. Emphasizes flaked artifacts. Includes physical examination, manufacture and experimentation with stone tools. Prerequisite: ANTHRO 2020/2022 or instructor's consent.

**ANTHRO 4828. Archaeological Analysis of Ceramics. 3 Credits.**

To introduce students to the basic methods and concepts used in the archaeological analysis of pottery. By the end of the semester students will understand the various ways that pottery is created and how archaeologists can use ceramics to gain insights into everything from the organization of craft production to trade to symbolism. Prerequisite: ANTHRO 2020 and/or 2022.

**ANTHRO 4830. Ethnographic Methods. 3 Credits.**

Relation of problems to techniques; surveys techniques of gathering data; discusses their limitations and potentials. Prerequisites: ANTHRO 2030 or instructor's consent.

**ANTHRO 4850. Practical Phonetics for Fieldwork. 3 Credits.**

(same as LINGST 4850). Self-paced course using computer and tape recorded lessons from world's languages. Teaches practical articulatory and transcription phonetics. Weekly meeting with instructor to monitor progress, resolve questions. Prerequisites: junior standing or instructor's consent.

**ANTHRO 4860. Techniques in Linguistic Analysis. 3 Credits.**

(same as LINGST 4860). Problems in analyzing data from various languages. Prerequisites: introductory course in LINGST or instructor's consent.

**ANTHRO 4870. Field Methods in Linguistics. 4 Credits.**

(same as LINGST 4870 and ENGLSH 4670). Intensive training in collection and analysis of data taken from a native speaker of non-Indo-European language. Prerequisites: 9 hours LINGST or instructor's consent.

**ANTHRO 4880. Demographic Anthropology. 3 Credits.**

The major topics considered in this course are basic demographic analysis, including life tables, models for population growth and stable population theory; fertility analysis; disease and fertility; disease in human populations; and paleodemography. Prerequisites: MATH 1100/1120 and junior/senior standing or instructor's consent. Math Reasoning Proficiency Course.

**ANTHRO 4890. Human Skeletal Identification and Analysis. 5 Credits.**

Students interested in archaeology, physical anthropology, and law enforcement will learn human osteological methods of analysis applied to bioarchaeological problems and modern forensic techniques for personal identification. Prerequisite: ANTHRO 2050/2052 or instructor's consent.

**ANTHRO 4894. Skeletal Biology. 3 Credits.**

This course is designed to provide students advanced and in-depth training in skeletal biology. Basic bone biology will be studied and advanced methods of skeletal analysis applicable to forensic anthropology and bioarchaeology will be explored. Prerequisites: ANTHRO 4890 or equivalent background in osteology and/ or anatomy.

**ANTHRO 4940. Internship in Anthropology. 3-6 Credit.**

Students will work for a semester in a community-based organization (NGO, nonprofit, for profit, or governmental). They will conduct a research study in coordination with that agency. Upon completion of the research study, students will prepare a final report to be given to the agency and turned in for course credit. The course coordinator will help students identify and make contact with interested organization and oversee their progress during the internship. Prerequisites: junior standing, Anthropology major, coordinator's consent, 2.5 GPA. Graded on S/U basis only.

**ANTHRO 4950. Undergraduate Research in Anthropology. 2-8 Credit.**

Advanced research approved by and under the direction of a departmental faculty member. Prerequisites: junior/senior standing and instructor's consent.

**ANTHRO 4950H. Honors Research in Anthropology. 3 Credits.**

Individual study and research leading to Honors in Anthropology. In consultation with instructor, student works on Honors Thesis. Anthropology majors only. Prerequisites: junior or senior standing; Honors level GPA, instructor's consent. May be repeated for up to 6 credit hours.

**ANTHRO 4960. Undergraduate Readings in Anthropology. 1-99 Credit.**

Directed readings in ethnology, linguistics, archaeology, or physical anthropology not leading to thesis. Prerequisites: two courses in Anthropology and instructor's consent.

**ANTHRO 4990. Capstone Seminar in Anthropology. 3 Credits.**

Readings, discussions, and problems in the integration of the subfields of anthropology through theory and examples. Prerequisites: Anthropology major and senior standing, or instructor's consent.

**ANTHRO 7001. Topics in Anthropology-General. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new contact areas. Specific content varies depending on needs of faculty or students and will be announced in advance.

**ANTHRO 7150. Special Themes in Folklore. 3 Credits.**

(same as ENGLSH7700). Intensive study in a selected area of folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature, or the folklore of a particular group. May be repeated for a maximum of six hours. Prerequisite: instructor's consent for repetition.

**ANTHRO 7160. Themes in African Diaspora Folklore. 3 Credits.**

(same as ENGLSH 7710 and BL\_STU 7710). Intensive study in a selected area of African Diaspora folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature; or the folklore of a particular group.

ENGLISH 7700 and 7710 may be repeated for a maximum of six hours with instructor's consent. Prerequisite: graduate standing.

**ANTHRO 7200. Environment and Archaeology. 3 Credits.**

Study of quaternary environments and cultural systems. Focuses on North American records emphasizing climate and biologic components of regional ecosystems; regional environmental reconstruction.

**ANTHRO 7240. History of Archaeology. 3 Credits.**

Growth of archaeology worldwide since AD 1700. Emphasis include intellectual and theoretical developments, field and laboratory techniques, and major figures in the history of the discipline.

**ANTHRO 7280. Archaeology of Religion. 3 Credits.**

(Same as REL\_ST 7280) This course examines how anthropologists conceptualize religious behavior, and how archaeologists use material remains to examine past religious behavior, rituals, religious practitioners, cosmological constructs, worldview and ideology in the Americas. Prerequisites: ANTHRO 2020 and/or REL\_ST 2100.

**ANTHRO 7300. Comparative Social Organization. 3 Credits.**

Cross-cultural comparison, analysis of social structures. Role of kinship, age, sex, locality, economics, religion and other factors in determining relationships between individuals and groups cross culturally.

**ANTHRO 7320. Ecological and Environmental Anthropology. 3 Credits.**

Cultural anthropological approaches to human-environment interaction; cultural adaptations to diverse environments; theoretical developments and current issues; cultural, social, and historical contexts of natural resource use. Prerequisites: graduate standing.

**ANTHRO 7340. Cultural Evolution and Change. 3 Credits.**

Alternative hypotheses about the relationship between culture and evolution are evaluated in light of ethnographic evidence.

**ANTHRO 7350. Psychological Anthropology. 3 Credits.**

Examines cross-cultural approaches to the study of perception, cognition, and personality; methods for gathering and validating data; examples from non-Western societies.

**ANTHRO 7360. Medical Anthropology. 3 Credits.**

Cross-cultural study of belief systems concerning health and illness, practices of diagnosis and treatment, and roles of patients and practitioners. Several non-Western health care systems are studied in detail. Prerequisite: graduate standing.

**ANTHRO 7370. Anthropology of Gender. 3 Credits.**

(Same as WGST 7370) The Anthropology of Gender Introduces the student to the variation in the relationships between males and females; and between men, women, and other genders from around the world. The different approaches to understanding and modeling gender are discussed, as are specific case-studies from many different cultures. Graduate standing required.

**ANTHRO 7380. Anthropological Theory of Religions. 3 Credits.**

(same as REL\_ST 7380). Course provides a critical evaluation of anthropological explanations of various forms of traditional religious behavior such as magic, shamanism, divination, ritual, mythology and witchcraft. The anthropological explanations examined range from nineteenth century classics to the current approaches of today.

**ANTHRO 7400. Language and Culture. 3 Credits.**

(same as LINGST 7400). Interrelations between language, thought, culture, and society; role of language in cognition; methods and concepts of linguistics in cultural analysis.

**ANTHRO 7412. Gender, Language, and Communication. 3 Credits.**

(same as COMMUN 7412 and LINGST 7412). Relationship among gender, language, nonverbal communication, and culture. Prerequisite: graduate standing.

**ANTHRO 7420. Historical Linguistics. 3 Credits.**

(same as LINGST 7420). Methods of tracing the history of languages by glottochronology, and by comparative and internal reconstructions; cultural and linguistic implications of such reconstructions and of areal linguistics. Prerequisites: graduate standing.

**ANTHRO 7500. Human Origins. 5 Credits.**

History and theory in the study of human paleontology.

**ANTHRO 7540. Human Biological Variation. 3 Credits.**

Human biological variation both among and within living populations. Evolutionary, genetic, ecological, demographic and especially cultural factors which contribute to biological variation.

**ANTHRO 7560. Anthropological Genetics. 3 Credits.**

Population genetic theory and methods applied to human and primate evolution and variation. Prerequisite: Anthropology [ANTHRO] 2050/2052 or Biological Science [BIO\_SC] 1500.

**ANTHRO 7580. Evolutionary Medicine. 3 Credits.**

Principles of modern evolutionary theory are applied to medical problems. Topics include: function of symptoms (fever, nausea, etc.); strategies of pathogens; senescence; cancer; phylogenetic constraints; mental disorders. Ideas will be actively discussed in class.

**ANTHRO 7600. Ethnographic Studies of Selected Cultures. 3 Credits.**

Specific content varies with student interest, faculty availability. Will concentrate on peoples and cultures of one area such as East Asia, South Asia, Africa, North America, Mesoamerica, Oceania, Europe. Amplifies ethnographic knowledge gained in lower-level survey courses. Prerequisite: graduate standing.

**ANTHRO 7620. North American Archaeology. 3 Credits.**

Ancient peoples and development of American Indian culture.

**ANTHRO 7640. Prehistory of the Greater Southwest. 3 Credits.**

The course will introduce students to the archaeology of aboriginal peoples of the American southwest and northwestern Mexico. The emphasis will be on prehistoric culture development from the Paleoindians to the arrival of the Spanish. Ethnographic and modern peoples will be discussed as well. Prerequisites: ANTHRO 2020/2021 Fundamentals of Archaeology. Graduate standing required.

**ANTHRO 7650. Prehistory of Mesoamerica. 3 Credits.**

Covers the archaeology and prehistory of Mesoamerica (Mexico and Northern Central America). Emphasis on archaeological evidence for development of human societies from late Pleistocene hunting bands to complex agricultural civilizations encountered by Europeans in 1500s. Prerequisite: graduate standing.

**ANTHRO 7670. Archaeology of South America. 3 Credits.**

Development of culture in South America from the Pleistocene to European contact. Prerequisites: Anthropology [ANTHRO] 2020/2021 or graduate standing.

**ANTHRO 7680. Cultures and Peoples of the Amazon. 3 Credits.**

Ethnographic survey of indigenous Amazonian cultures Graduate Standing Required.

**ANTHRO 7700. Old World Prehistory. 3 Credits.**

Beginnings of culture in the old world through the early Iron Age.

**ANTHRO 7720. Mesolithic, Neolithic, and Bronze Age Archaeology. 3 Credits.**

Analysis of both hunter-gatherer and food-producing prehistoric sociocultural systems in western Eurasia and adjacent areas from the end of the Pleistocene until the development of iron metallurgy. Includes the symbolic material of these periods. Prerequisites: graduate standing.

**ANTHRO 7740. Celtic and Iron Age Archaeology. 3 Credits.**

Analysis of the pre-and protohistoric sociocultural systems of the Celts and other iron-using tribal cultures of western Eurasia from the inception of an iron based technology until the full historic period. Includes the symbolic material of these cultures. Prerequisites: graduate standing.

**ANTHRO 7770. Asiatic Prehistory. 3 Credits.**

Survey of the prehistory and early cultures of Asia excluding the Near East. Emphasis on Northern Asia, China, Japan, South and Southeast Asia and Oceania. Prerequisites: graduate standing.

**ANTHRO 7790. Cultures and Society in South Asia. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 7790). Survey of the cultures, social organizations, and lived experience of people from across the Indian subcontinent. Major topics include cast, kinship, gender, religion, village life, urbanization, public culture, popular culture, social change, and the South Asian Diaspora. Prerequisite: graduate standing.

**ANTHRO 7800. Field Methods in Archaeology. 1-8 Credit.**

Techniques of archaeological excavation; field surveying, recording, care and interpretation of materials. Prerequisite: graduate standing.

**ANTHRO 7810. Paleoethnobotany. 3 Credits.**

Application of ethnobotanical approaches in archaeology; techniques to recover and interpret floral remains (macroremains, phytoliths, pollen); research questions in ethnobotany; integration of ethnobiological and archaeological data. Critique of original works in the field emphasized. Prerequisites: graduate standing.

**ANTHRO 7820. Zooarchaeology. 3 Credits.**

Survey of specialized techniques for archaeological/faunal analysis, including zoo archaeological sampling, taphonomy study of paleoecology, and recognition of domestication. Prerequisites: graduate standing.

**ANTHRO 7826. Stone Artifact Analysis. 3 Credits.**

Theory, methods, and techniques of studying lithic artifacts and deriving culturally meaningful interpretations. Emphasizes flaked artifacts. Includes physical examination, manufacture and experimentation with stone tools.

**ANTHRO 7828. Archaeological Analysis of Ceramics. 3 Credits.**

To introduce students to the basic methods and concepts used in the archaeological analysis of pottery. By the end of the semester students will understand the various ways that pottery is created and how archaeologists can use ceramics to gain insights into everything from the organization of craft production to trade to symbolism. Prerequisites: ANTHRO 2020 and/or 2022. Graduate standing required.

**ANTHRO 7830. Ethnographic Methods. 3 Credits.**

Relation of problems to techniques; surveys techniques of gathering data; discusses their limitations and potentials. Prerequisites: graduate standing.

**ANTHRO 7850. Practical Phonetics for Fieldwork. 3 Credits.**

(same as LINGST 7850). Self-paced course using computer and tape recorded lessons from world's languages. Teaches practical articulatory and transcription phonetics. Weekly meeting with instructor to monitor progress, resolve questions. Prerequisites: graduate standing.

**ANTHRO 7860. Techniques in Linguistic Analysis. 3 Credits.**

(same as LINGST 7860). Problems in analyzing data from various languages.

**ANTHRO 7870. Field Methods in Linguistics. 4 Credits.**

(same as LINGST 7870 and ENGLSH 7670). Intensive training in collection and analysis of data taken from a native speaker of non-Indo-European language. Prerequisites: 6 hours of LINGST, graduate standing and instructor's consent.

**ANTHRO 7880. Demographic Anthropology. 3 Credits.**

The major topics considered in this course are basic demographic analysis, including life tables, models for population growth and stable population theory; fertility analysis; disease and fertility; disease in human populations; and paleodemography.

**ANTHRO 7890. Human Skeletal Identification and Analysis. 5 Credits.**

Students interested in archaeology, physical anthropology, and law enforcement will learn human osteological methods of analysis applied to bioarchaeological problems and modern forensic techniques for personal identification.

**ANTHRO 7894. Skeletal Biology. 3 Credits.**

This course is designed to provide students advanced and in-depth training in skeletal biology. Basic bone biology will be studied and advanced methods of skeletal analysis applicable to forensic anthropology and bioarchaeology will be explored.

**ANTHRO 7940. Internship in Anthropology. 3-6 Credit.**

Students will work for a semester in a community-based organization (NGO, nonprofit, for profit, or governmental). They will conduct a research study in coordination with that agency. Upon completion of the research study, students will prepare a final report to be given to the agency and turned in for course credit. The course coordinator will help students identify and make contact with interested organization and oversee their progress during the internship. Prerequisites: graduate standing and coordinator's consent. Graded on S/U basis only.

**ANTHRO 7950. Introduction to Post-Graduate Anthropology. 1 Credit.**

How to succeed in graduate school and profession, and who is MU Anthropology. Introduces skills for success in graduate school, describes attributes of a professional anthropologist and how to find a job. Handouts and readings supplement discussions. Graduate standing required. Graded on S/U basis only.

**ANTHRO 7960. Graduate Readings in Anthropology. 1-99 Credit.**

Directed readings in ethnology, linguistics, archaeology, or physical anthropology not leading to thesis. Prerequisites: graduate standing and instructor's consent.

**ANTHRO 7990. Non Thesis Research in Anthropology. 1-99 Credit.**

Original research not leading to the preparation of a thesis or dissertation. Prerequisite: instructor's consent.

**ANTHRO 8001. Topics in Anthropology-General. 3 Credits.**

Problems, topics, issues, or review of research; experimental development of new content areas. Specific content varies depending on needs of faculty or students and is announced in advance. May be repeated to a maximum of 9 hours.

**ANTHRO 8010. History of Anthropology I. 3 Credits.**

Development of anthropological theories, methods, perspectives, major figures and contributions in cultural and linguistic subfields.

**ANTHRO 8020. History of Anthropology II. 3 Credits.**

Development of anthropological theories, methods, perspectives, major figures and contributions in archaeology and biological anthropology.

**ANTHRO 8090. Masters Thesis Research in Anthropology. 1-99 Credit.**

Advanced work leading to thesis. Prerequisite: consent of major advisor. Graded on a S/U basis only.

**ANTHRO 8157. Seminar in Folklore. 3 Credits.**

(same as ENGLISH 8700 and REL\_ST 8700). Roots of folklore scholarship and methodology; their evolution in modern approaches to the study of oral, traditional, verbal genres; and their performance in natural folk groups. Prerequisites: graduate standing or permission of instructor. May repeat to twelve hours with departments consent.

**ANTHRO 8187. Seminar in Ecological Adaptation. 3 Credits.**

Relationships and interactions between humans and their environments, with emphasis on the physical and cultural adaptations to environment. May be repeated to 9 hours maximum.

**ANTHRO 8257. Seminar in Ethnohistory. 3 Credits.**

Introduction to the uses of historical documents and historical methods in anthropological research. May be repeated to 6 hours maximum.

**ANTHRO 8287. Seminar in Theory and Methods in Archaeology. 3 Credits.**

Application of theory and conceptual frameworks to archaeological studies drawn from both Old and New Worlds. Maybe repeated to 6 hours maximum.

**ANTHRO 8357. Seminar in Psychological Anthropology. 3 Credits.**

Focuses on developments in psychological anthropology, cross-cultural psychology. Special attention on cognition, perception, socialization, personality assessment, psycho-cultural change, psycho-linguistics, psychometrics, within cross-cultural contexts. May be repeated to 6 hours maximum.

**ANTHRO 8387. Seminar in Health Anthropology. 3 Credits.**

We survey the field of health behaviors from an anthropological perspective. We ask, what are health behaviors? and what models have social scientists proposed to account for such actions? May be repeated to 6 hours maximum.

**ANTHRO 8487. Seminar in Anthropological Linguistics. 3 Credits.**

(same as Linguistics [LINGST] 8487). Topics: Ethnolinguistics, linguistic prehistory, pidgin and Creole languages, linguistic theories and cultural and cultural analysis. French structural anthropology. May be repeated for 9 hours maximum. Prerequisites: instructor's consent.

**ANTHRO 8587. Seminar in Physical Anthropology. 3 Credits.**

Readings and discussion concerning current problems in human and nonhuman primate evolution, with emphasis on taxonomy, morphology, and behavior. May be repeated to 9 hrs maximum.

**ANTHRO 8687. Seminar in Cultural Dynamics. 3 Credits.**

Focuses on geographical, topical, and/or theoretical developments within cultural anthropology. May repeat to 6 hours maximum.

**ANTHRO 8787. Seminar in Old World Archaeology. 3 Credits.**

Intensive studies in application of anthropological concepts to problems in Old World archaeology and prehistory. May be repeated to 9 hours maximum.

**ANTHRO 8857. Scientific Writing in Anthropology. 3 Credits.**

Students will be taught to construct research papers that reflect logic, organization, and clarity. Topics covered include outline preparation,

syntax, punctuation, sentence construction, and correct reference citation.

**ANTHRO 8887. Seminar in Anthropological Methods. 3 Credits.**

Focuses on specific methods/techniques for collecting and analyzing data in archaeological, biological, linguistic, and/or cultural anthropology. May be repeated to 6 hours maximum.

**ANTHRO 8888. Analyzing Anthropological Data I. 3 Credits.**

Provides students with the conceptual and analytic tools necessary to conduct and evaluate the analysis of anthropological data. Examples gleaned from archaeology, bioanthropology, ethnography, and linguistics will provide a broad perspective of the application and utility of the various methods discussed.

**ANTHRO 8889. Analyzing Anthropological Data II. 3 Credits.**

This course introduces a variety of conceptual tools and advanced quantitative methods that anthropologists use to analyze their data. It includes an introduction of common software packages used to manipulate and analyze anthropological data. Prerequisites: ANTHRO 8888 or grad-level intro stats or instructor's consent. Graduate standing required.

**ANTHRO 8960. Graduate Readings in Anthropology. 1-99 Credit.**

Directed readings in ethnology, linguistics, archaeology, or physical anthropology not leading to thesis. Prerequisites: graduate standing and instructor's consent.

**ANTHRO 8987. Seminar in Formal Anthropological Research Design. 3 Credits.**

Methods of fitting statistical and formal research designs to quantitative and qualitative data discussed and illustrated, with research by participants. Prerequisite: introductory course in statistics. May repeat to 9 hours maximum.

**ANTHRO 8990. Non Thesis Research in Anthropology. 1-99 Credit.**

Original research not leading to the preparation of a dissertation. Prerequisite: consent of major advisor.

**ANTHRO 9090. Doctoral Dissertation Research in Anthropology. 1-99 Credit.**

Advanced work leading to dissertation. Prerequisite: consent of major advisor. Graded on a S/U basis only.

## Arabic (ARABIC)

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**ARABIC 1100. Elementary Arabic I. 6 Credits.**

An elementary level course designed to facilitate student's acquisition of basic proficiency in communication within culturally significant contexts. Students learn Modern Standard Arabic language skills in an environment integrating interactive video and classroom instruction.

**ARABIC 1200. Elementary Arabic II. 6 Credits.**

This course builds upon the foundation established in 1100. Greater emphasis is placed on oral and written expression. Cultural issues are explored in an environment integrating interactive video and classroom instruction.

**ARABIC 2005. Undergraduate Topics in Arabic - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. May be repeated with departmental consent. No language credit. Prerequisite: sophomore standing or instructor's consent. Graded on A/F basis only.

## Architectural Studies (ARCHST)

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### **ARCHST 1005. Topics in Architectural Studies - Humanities. 1-99 Credit.**

Organized study of selected topics in architectural studies. Particular topic and earnable credit may vary by semester. Prerequisite: instructor's consent. May be repeated for credit up to 6 credit hours.

### **ARCHST 1100. Visual Design. 3 Credits.**

Design study on introduction to basic design and visual composition and their application to creation of two- and three-dimensional abstract and / or functional design. Studio exercises expressed through drawings and abstract models, using various media.

### **ARCHST 1200. Architectural Drafting and Working Drawings. 3 Credits.**

Beginning drafting including equipment and materials; lettering; floor plans, sections, elevations; orthographic and axonometric drawings; working drawings; and details.

### **ARCHST 1600. Fundamentals of Environmental Design. 3 Credits.**

Survey of the architectural environment emphasizing design fundamentals such as use, aesthetics, stability of structures and human relationships with places and time.

### **ARCHST 2005. Topics in Architectural Studies - Humanities. 1-99 Credit.**

Organized study of selected topics in architectural studies. Particular topic and earnable credit may vary by semester. Prerequisite: instructor's consent. May be repeated for credit up to 6 credit hours.

### **ARCHST 2085. Problems in Architectural Studies. 3 Credits.**

Supervised independent work. Prerequisite: instructor's consent.

### **ARCHST 2100. Understanding Architecture and the American City. 3 Credits.**

Analysis of the American city and its architecture.

### **ARCHST 2210. Understanding Visualization for Animated Films. 3 Credits.**

Provides a critical overview of design and visualization techniques in animated film making. Emphasizes the role of built environment and spatial design features.

### **ARCHST 2220. Computer-Aided Drafting with AutoCad. 3 Credits.**

Introduction to computer-aided drafting and design with AutoCad software. Emphasis will be placed on development of skills and problem solving related to the professions of environmental and interior design. Prerequisite: Architectural Studies [ARCHST] 1200.

### **ARCHST 2230. Design Communication I. 3 Credits.**

Beginning studio course in techniques and conventions of graphic communication as an aid in the design process for interior designers. Prerequisites: Architectural Studies [ARCHST] 1200 or equivalent and admission to Studio Sequence in Architectural Studies.

### **ARCHST 2310. Building Systems. 3 Credits.**

Integrated building systems: structure, construction, technology, comfort; including voice-data communication, safety, floor, wall, ceiling, mechanical, electrical, and plumbing systems; and project estimating. Prerequisite: Architectural Studies [ARCHST] 1200, Mathematics [MATH] 1100/1120.

### **ARCHST 2315. Introduction to Building Systems Laboratory. 1 Credit.**

Building system renovations, materials, processes, finishes, and applications testing: furniture design, fabrication, finishing, lighting, concrete and masonry, wood and steel light framing construction, and mock-up fabrication and testing. All equipment training and safety is covered in this introductory course.

### **ARCHST 2316. Advanced Building Systems Lab. 2 Credits.**

Advanced exposure to building system renovations, materials, processes, finishes, and applications testing: furniture design, fabrication, finishing, lighting, concrete and masonry, wood and steel light framing construction, and mock-up fabrication and testing. Prerequisite: Architectural Studies [ARCHST] 2315. Graded on A/F basis only.

### **ARCHST 2811. Studio I. 4 Credits.**

Application of basic design and composition to built form. Studio exercises in two and three dimensions using various media relating to usable spaces. Formation of design concept, development of form and space, and application in built environment. Prerequisite: Architectural Studies [ARCHST] 1200 and admission to Studio Sequence in Architectural Studies.

### **ARCHST 3100. Color and Light. 3 Credits.**

The theory, application, and specification of color and light for interior and architectural design. Lecture and studio format. Prerequisite: Architectural Studies [ARCHST] 1100.

### **ARCHST 3182. Studio II. 4 Credits.**

Application of basic design principles to built forms and functional spaces. Identification and manipulation of elements of design, understanding spatial relationships between human body and spatial enclosures related to built forms. Spatial organization and familiarity with role of immediate context. Prerequisites: Architectural Studies [ARCHST] 2811, instructor's consent. Co-requisites: Architectural Studies [ARCHST] 2230, 2310.

### **ARCHST 3230. Design Communication II. 3 Credits.**

Advanced studio course in techniques and conventions of graphic communication as aids in the design process. Prerequisite: Architectural Studies [ARCHST] 2230.

### **ARCHST 3371. Design Resource Management. 1 Credit.**

Field experience (5 hours per week) in organization and management of resources used by interior designers, including references, product information, and samples of materials and finishes. Prerequisite: restricted to Architectural Studies students only.

### **ARCHST 3600. Environmental Analysis. 3 Credits.**

Discover through analytical methods of primary organizational factors which operate in a building and reveal the preoccupations of designer. Analytical approach investigates design principles by means of dissection. Prerequisite: Architectural Studies [ARCHST] 1200, 1600.

### **ARCHST 3860. Human Factors Programming. 3 Credits.**

Design Programming for Human Factors using a Case Study. Prerequisite: Architectural Studies [ARCHST] 1600.

### **ARCHST 4001. Topics in Architectural Studies. 1-99 Credit.**

Selected current topics in field of interest.

### **ARCHST 4085. Problems in Architectural Studies. 1-99 Credit.**

Supervised independent work. Prerequisites: 3000-level course in field of problem and junior or senior standing and instructor's consent.

**ARCHST 4230. Computer Graphic Application for Design I. 3 Credits.**

Applications of computer graphics for design and art; includes visualization, animation and creative development. Prerequisite: junior standing. May repeat up to 12 credit hours maximum.

**ARCHST 4320. Materials, Methods and Products. 3 Credits.**

Inherent qualities of materials used in the design of interior environments. Manufacturing, application, and installation methods. Focus on environmentally sensitive materials. Prerequisite/Corequisite: Architectural Studies [ARCHST] 2310 or instructor's consent.

**ARCHST 4323. Sustainable Technologies and Systems. 3 Credits.**

An in-depth study of ecologically-sensitive and energy-efficient strategies used in building and interiors. Prerequisite: junior standing required.

**ARCHST 4333. Compliance and Specifications. 3 Credits.**

Application of laws, codes, regulations, standards in specifying for life safety, barrier-free and universal design, lighting, human factors, and contract documents. Prerequisites: Architectural Studies [ARCHST] 2220, 4320, 4813 or 4823.

**ARCHST 4355. Recent Trends in Digital Media I. 1-99 Credit.**

Recent Trends in Digital Media I.

**ARCHST 4410. History of the Designed Environment to 1750. 3 Credits.**

An in-depth study of the designed environment including housing interiors, and furniture of the major historical periods from prehistory to the Industrial Revolution. Prerequisites: Art History and Archaeology [AR\_H\_A] 1110 or 1120.

**ARCHST 4411. Study Abroad in Architectural History. 1-3 Credit.**

Discovery of historic architecture through on-site tour of timeless cities and places. Prerequisites: instructor's consent. May be repeated for credit.

**ARCHST 4420. History of the Designed Environment after 1750. 3 Credits.**

An in-depth study of the designed environment, including housing, interiors, and furniture of the major historical periods from the Industrial Revolution to today. Prerequisites: Art History and Archaeology [AR\_H\_A] 1110 or 1120.

**ARCHST 4430. Guiding Design with Historic Preservation. 3 Credits.**

Approaches to historic preservation; historic roots of architecture and interiors; regulations and design guidelines governing intervention; assessing significance of historic properties. Pre- or co-requisite: American History or Government, or Art History, or instructor consent.

**ARCHST 4440. Design Precedents: Architecture, Interiors and Furniture since the Industrial Revolution. 3 Credits.**

Analysis of historical exemplars of architecture, interiors and furniture design offering strategies for approaching contemporary design problems. Covers design precedents from industrial revolution to contemporary design. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or 1120, or Architectural Studies [ARCHST] 4430.

**ARCHST 4550. Visual Presentation for Design. 3 Credits.**

Emphasizes principles and techniques for effective visual design presentation. Focuses on concepts of design, layout, storytelling, critiques, and hands on exercise.

**ARCHST 4555. Recent Trends. 1-99 Credit.**

Upper-division students seeking additional knowledge in specific subject matter areas including digital media software.

**ARCHST 4620. Environment and Behavior. 3 Credits.**

Evaluate relationships between human behavior and environmental design. Survey of environment and behavior theoretical foundations examining how these concepts translate into a more responsive theory of design. Prerequisites: junior standing.

**ARCHST 4630. Shaping Human Settlements. 3 Credits.**

Review classic designs and designers, key concepts and enduring issues of community design within the overall framework of environmental design. Prerequisite: junior standing.

**ARCHST 4660. Housing Concepts and Issues. 3 Credits.**

Evaluate housing policies, regulations, codes, programs; global and ecological perspectives of environment and behavior; historic preservation; financial issues; trends and projections. Prerequisite: junior standing.

**ARCHST 4700. Place-Making in Community Design. 3 Credits.**

Ideologies, case studies and participatory methods on place-making in community design. Use processes to design a place-making scheme in actual community project. Prerequisite: junior standing.

**ARCHST 4710. Design Business Practices. 3 Credits.**

Analysis of the basic professional, human, and business skills necessary for the successful design practice. Pre- or Co-requisites of Studio IV and anticipated graduation during final academic year.

**ARCHST 4813. Interiors Studio III. 4 Credits.**

Spatial morphology, organization pattern, construction methods, materials, systems, and processes and integration with total design processes. Space planning and spatial manipulation in response to social, environmental, functional, and aesthetics specific to interiors. Instructor's consent required. Co-requisite: Architectural Studies [ARCHST] 3182 and 3230.

**ARCHST 4814. Interiors Studio IV. 4 Credits.**

Continuation of Architectural Studies 4813. Manipulation of form and space responding to programmatic functions and activities, and constraints imposed by structure, building materials, spatial enclosure, and related factors. Projects may involve designing single-function space to multiple-function layered spaces--both vertically and horizontally. Prerequisite: Architectural Studies [ARCHST] 4813.

**ARCHST 4815. Construction Documents and Building Information Modeling Studio. 4 Credits.**

Studio of how materials, systems, and assemblies reinforce and extend intentions of designers. Course teaches strategies and techniques for integration and coordination of the building components and details in construction documents and building information modeling. Pre or co-requisite: Architectural Studies [ARCHST] 4814 or 4824.

**ARCHST 4823. Architectural Studio III. 4 Credits.**

Continuation of Architectural Studies [ARCHST] 3182. Spatial morphology, organization pattern, construction methods, materials, systems, and processes and integration with total design process. Space planning and spatial manipulation in response to social, environmental, functional, and aesthetics specifics to architecture. Prerequisites: Architectural Studies [ARCHST] 3182; 3230.

**ARCHST 4824. Architectural Studio IV. 4 Credits.**

Continuation of Architectural Studies [ARCHST] 4823. Manipulation of form and space responding to programmatic functions and activities, and constraints imposed by structure, building materials, spatial enclosure, and related factors. Projects may involve designing single-function space

to multiple-function layered spaces - both vertically and horizontally.  
Prerequisite: Architectural Studies [ARCHST] 4823.

**ARCHST 4860. Programming for Thesis Design Studio. 1-2 Credit.**  
Develop written comprehensive program for thesis design studio project. Supervised by student-selected committee -- one departmental thesis advisor and at least one additional faculty member. Prerequisite/co-requisite: Architectural Studies [ARCHST] 4814 or 4824.

**ARCHST 4940. Internship in Environmental Design. 1-99 Credit.**  
Field experience in design under professional and educational supervision. Prerequisites: instructor's consent. Graded on S/U basis only.

**ARCHST 4960. Readings in Architectural Studio. 1-99 Credit.**  
Readings in recent research materials.

**ARCHST 4990. Thesis Design Studio. 4 Credits.**  
Capstone experience on a single comprehensive project. Objective is to enable synthesis of previous course work by addressing a design problem defined in Architectural Studies [ARCHST] 4860. Prerequisites: Architectural Studies [ARCHST] 4860, 4814 or 4824.

**ARCHST 7001. Topics in Environmental Design. 1-99 Credit.**  
Selected current topics in field of interest. Prerequisite: graduate standing.

**ARCHST 7085. Problems in Environmental Design. 1-99 Credit.**  
Supervised independent work. Prerequisites: 3000-level course in field of problem and graduate standing and instructor's consent.

**ARCHST 7100. Allied Architecture and Urban Design. 3 Credits.**  
Overview of the built environment in relation to architecture and allied design. Emphasis on architecture, interior, landscape and urban design studies.

**ARCHST 7230. Computer Graphic Application for Design I. 3 Credits.**  
Applications of computer graphics for design and art; includes visualization, animation and creative development. Prerequisite: graduate standing. May repeat up to 12 credit hours maximum.

**ARCHST 7232. Graduate Design Communication I. 3 Credits.**  
Studio course in techniques and conventions of graphic communication as an aid in the design process of built forms.

**ARCHST 7310. Graduate Building Systems. 3 Credits.**  
Integrated building systems; structure construction, technology, comfort; including voice-communications, safety, floor, wall, ceiling, mechanical, electrical, and plumbing systems, project estimating and management. Prerequisites: Mathematics [MATH] 1100/1120.

**ARCHST 7315. Graduate Systems Laboratory. 1-9 Credit.**  
Experimental learning setting involving building construction systems, renovation, materials and finishes testing and experimentation. Focus on hands-on opportunities investigating building technology properties in detail. Laboratory 3 hrs/week.

**ARCHST 7320. Materials, Methods and Products. 3 Credits.**  
Inherent qualities of materials used in the design of interior environments. Manufacturing, application, and installation methods. Focus on environmentally sensitive materials. Prerequisite: graduate standing and Mathematics [MATH] 1100/1120.

**ARCHST 7323. Sustainable Technologies and Systems. 3 Credits.**  
An in-depth study of ecologically-sensitive and energy-efficient strategies used in buildings and interiors.

**ARCHST 7333. Compliance and Specifications. 3 Credits.**  
Application of laws, codes, regulations, standards in specifying for life safety, barrier-free and universal design, lighting, human factors, and contract documents. Prerequisites: graduate standing and Textile and Apparel Management [T\_A\_M] 2100 and Mathematics [MATH] 1100/1120.

**ARCHST 7355. Recent Trends in Digital Media I. 2-4 Credit.**  
Recent Trends in Digital Media I.

**ARCHST 7410. History of the Designed Environment to 1750. 3 Credits.**  
An in-depth study of the designed environment including housing interiors, and furniture of the major historical periods from prehistory to the Industrial Revolution. Prerequisites: graduate standing and Art History and Archaeology [AR\_H\_A] 1110 and 1120.

**ARCHST 7411. Study Abroad in Architectural History. 1-99 Credit.**  
Discovery of historic architecture through on-site tour of timeless cities and places. Prerequisites: instructor's consent. May be repeated for credit.

**ARCHST 7420. History of the Designed Environment after 1750. 3 Credits.**  
An in-depth study of the designed environment, including housing, interiors, and furniture of the major historical periods from the Industrial Revolution to today. Prerequisites: Art History and Archaeology [AR\_H\_A] 1110 or 1120.

**ARCHST 7430. Guiding Design with Historic Preservation. 3 Credits.**  
Approaches to historic preservation; historic roots of architecture and interiors; regulations and design guidelines governing intervention; assessing significance of historic properties. Prerequisites: American History or Government or Art History or instructor's consent. Graduate standing required.

**ARCHST 7440. Design Precedents: Architecture, Interiors and Furniture since the Industrial Revolution. 3 Credits.**  
Analysis of historical exemplars of architecture, interiors and furniture design offering strategies for approaching contemporary design problems. Covers design precedents from industrial revolution to contemporary design. Prerequisite: Graduate standing.

**ARCHST 7550. Visual Presentation for Design. 3 Credits.**  
Emphasizes principles and techniques for effective visual design presentation. Focuses on concepts of design, layout storytelling, critiques and hands on exercises.

**ARCHST 7555. Recent Trends in Environmental Design. 1-99 Credit.**  
Upper-division students seeking additional knowledge in specific subject matter areas including digital media software. Prerequisite: graduate standing.

**ARCHST 7620. Environment and Behavior. 3 Credits.**  
Evaluate relationships between human behavior and environmental design. Survey of environment and behavior theoretical foundations examining how these concepts translate into a more responsive theory of design. Prerequisites: graduate standing.

**ARCHST 7630. Shaping Human Settlements. 3 Credits.**  
Review classic designs and designers, key concepts and enduring issues of community design within the overall framework of environmental design. Prerequisite: graduate standing.

**ARCHST 7640. Physical Function and Older Adults. 3 Credits.**  
(Same as Family and Community Medicine [F\_C\_MD] 7750, Health Management and Informatics [HMI] 7750, Human Development and Family Studies [H\_D\_FS] 7750, Nursing [NURSE] 7750, Public Health [P\_HLTH] 7750, and Social Work [SOC\_WK] 7752). This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graduate Standing Required. Graded on A/F basis only.

**ARCHST 7650. Psychosocial Function and Older Adults. 3 Credits.**  
(same as Family Community Medicine [F\_C\_MD] 7751, Health Management and Informatics [HMI] 7751, Human Development and Family Studies [H\_D\_FS] 7751, Nursing [NURSE] 7751, Public Health [P\_HLTH], 7751 and Social Work [SOC\_WK] 7751). This course takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**ARCHST 7660. Housing Concepts and Issues. 1-12 Credit.**  
Evaluate housing policies, regulations, codes, programs; global and ecological perspectives of environment and behavior; historic preservation; financial issues; trends and projections. Prerequisite: graduate standing.

**ARCHST 7700. Place-Making in Community Design. 3 Credits.**  
Ideologies, case studies and participatory methods on place-making in community design. Use processes to design a place-making scheme in actual community project. Prerequisite: graduate standing.

**ARCHST 7710. Design Business Practices. 3 Credits.**  
Analysis of the basic professional, human, and business skills necessary for the successful design practice. Pre or Co-requisites of Studio IV and anticipated graduation during final academic year and graduate standing.

**ARCHST 7815. Studio V. 4 Credits.**  
A continuation of previous studio with emphasis on digital media. Prerequisite: graduate standing.

**ARCHST 7840. Graduate Design Studio. 3 Credits.**  
Advanced graduate level design experience emphasizing project complexity, design skill refinement, and optional development of thesis project strategies. Prerequisites: instructor's consent.

**ARCHST 7940. Internship in Environmental Design. 1-99 Credit.**  
Field experience in design under professional and educational supervision. Prerequisites: graduate standing and instructor's consent. Graded on S/U basis only.

**ARCHST 7960. Readings in Environmental Design. 1-99 Credit.**  
Readings in recent research materials. Prerequisite: graduate standing.

**ARCHST 8001. Topics in Environmental Design. 1-99 Credit.**  
Selected current topics in field of interest.

**ARCHST 8050. Research Methods in Environmental Design. 3 Credits.**  
A comparative study of quantitative and qualitative methods in environmental design with emphasis on research results and analyses. Lectures and seminar discussions. Prerequisite: 12 hours advanced design.

**ARCHST 8085. Problems in Environmental Design. 1-99 Credit.**  
Prerequisites: 4000-level course in field of problem and instructor's consent.

**ARCHST 8090. Master's Research in Environmental Design. 1-99 Credit.**  
Independent research leading to a creative project. Graded on S/U basis only.

**ARCHST 8230. Computer Graphic Application for Design II. 3 Credits.**  
Creative computer graphic modeling, rendering and animation projects related to the academic background and interests of individual students. May be repeated to 6 hours maximum.

**ARCHST 8233. Graduate Design Communication II. 3 Credits.**  
Advanced studio in techniques and conventions of graphic communication as aides in the design process. Prerequisite: Architectural Studies [ARCHST] 7232 or advisor's consent.

**ARCHST 8600. Graduate Environmental Analysis. 3 Credits.**  
Analysis of design principles and organizational factors operating in a building by means of dissection. Volumetric disposition, circulation pattern, axes, structural system, materials, purpose, and symbolism. Prerequisite: graduate standing.

**ARCHST 8630. Design Theory. 3 Credits.**  
Formal environmental design theory concerning historical precedents, current aesthetic trends, and design processes. Assignments investigate philosophical influences, architectonic vocabularies, and communication of idea and artifact. Prerequisite: graduate standing or instructor's consent. May be repeated up to 12 credit hours.

**ARCHST 8820. Graduate Digital Design Studio. 1-99 Credit.**  
Graduate level design experience emphasizing project complexity, design skill refinement, and use of digital media for design representation.

**ARCHST 8830. Digital Design Studio II. 4 Credits.**  
Advanced graduate level design experience emphasizing design, documentation, and representation using digital media. Optional development of graduate thesis project may be scheduled in this studio.

**ARCHST 8840. Graduate Design Studio. 1-99 Credit.**  
Advanced graduate level design experience emphasizing project complexity, design skill refinement, and optional development of thesis project strategies. Prerequisites: instructor's consent.

**ARCHST 8850. Seminar in Environmental Design. 1-4 Credit.**  
Reports, discussion of recent work in area of concentration.

**ARCHST 8887. Environment and Behavior II. 3 Credits.**  
Synthesis of environment and behavior themes in design research and application to professional practice. Research on socio-behavioral phenomena, user groups, places. Emphasis on integrated interactive character of elements. Prerequisite: graduate standing or instructor's consent.

**ARCHST 8950. Qualitative Research Methods. 3 Credits.**  
Explores qualitative research methods as foundation for subsequent study. Focuses on qualitative research of the built environment. Prerequisite: graduate standing. Course may be repeated for credit.

**ARCHST 8960. Readings in Environmental Design. 1-99 Credit.**  
Readings in recent research materials. Prerequisite: Architectural Studies [ARCHST] 4960/7960 and graduate standing.



**ARCHST 8990. Thesis Project Proposal. 1 Credit.**

The formal opportunity to express the intent and scope of the thesis project. Prerequisite: instructor's consent.

**ARCHST 9001. Topics in Environmental Design. 1-99 Credit.**

Selected current topics in field of interest.

**ARCHST 9085. Problems in Environmental Design. 1-99 Credit.**

Prerequisites: 4000-level course in field of problem and instructor's consent.

**ARCHST 9090. Doctoral Research in Environmental Design. 1-99 Credit.**

Independent research leading to thesis or dissertation. Graded on a S/U basis only.

**ARCHST 9555. Recent Trends in Environmental Design. 1-99 Credit.**

For students seeking additional knowledge and understanding in specific subject matter areas.

**ARCHST 9990. Dissertation Proposal. 1 Credit.**

A formal dissertation proposal is written and presented to the dissertation committee for approval. Prerequisite: instructor's consent.

**ARCHST 9995. Pilot Project for Dissertation. 1-99 Credit.**

Working with advisor, student proposes, conducts, and reports the findings from a pilot study germane to the dissertation topic in preparation for the dissertation research. Prerequisite: instructor's consent.

## Art History And Archaeology (AR\_H\_A)

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**AR\_H\_A 1005. Undergraduate Topics in Art History and Archaeology- Humanities. 1 Credit.**

Special studies in Art History and Archaeology.

**AR\_H\_A 1010. Introduction to Museum of Art and Archaeology, UMC. 1 Credit.**

This course is a brief introduction to the Museum of Art and Archaeology on Francis Quadrangle. Special attention will be given to the history of the Museum, to its operation and to its collection. Guest lecturers from the from the Museum will provide first hand accounts of their contributions to the day-to-day operations of the Museum and to the academic mission of the University.

**AR\_H\_A 1020. Giotto and the Arena Chapel. 1 Credit.**

This course is a brief introduction to one of the major monuments of western art, the Area (or Scrovegni) Chapel of Giotto di Bondone. Special attention will be given to stories about him by Renaissance authors.

**AR\_H\_A 1030. Early Works of Michelangelo. 1 Credit.**

This course is a brief introduction to the life and work of Michelangelo. Special attention will be given to his early works and to stories about him, especially those by Giorgio Vasari in his Lives of the Artist, Florence, 1568.

**AR\_H\_A 1040. Rembrandt. 1 Credit.**

This course is a brief introduction to the life and work of the seventeenth-century Dutch painter Rembrandt van Rijn. Special Attention is give to the appreciation of his art by his contemporaries.

**AR\_H\_A 1105. Undergraduate Topics in Art History and Archaeology. 3 Credits.**

Special studies in Art History and Archeology.

**AR\_H\_A 1110. Ancient and Medieval Art. 3 Credits.**

Introductory survey of the architecture, sculpture and painting of the ancient Near East, Greece, Rome, Byzantium and Medieval Europe.

**AR\_H\_A 1110H. Ancient & Medieval Art - Honors. 3 Credits.**

Introductory survey of the architecture, sculpture and painting of the ancient Near East, Greece, Rome, Byzantium and Medieval Europe. Honors eligibility required.

**AR\_H\_A 1120. Renaissance through Modern Art. 3 Credits.**

Introductory survey of architecture, sculpture and painting of Europe and America from the Renaissance to Modern times.

**AR\_H\_A 1120H. Renaissance through Modern Art - Honors. 3 Credits.**

Introductory survey of architecture, sculpture and painting of Europe and America from the Renaissance to Modern times. Honors eligibility required.

**AR\_H\_A 1230. Introduction to Asian Arts. 3 Credits.**

(same as History [HIST] 1820, Religious Studies [REL\_ST] 1820, South Asian Studies [S\_A\_ST] 1152). This course is an introduction to the literature and visual arts of Asia through selected master works. It focuses principally on India and China and investigates the distinctive features of their cultures.

**AR\_H\_A 2005. Topics Art History and Archaeology - Humanities. 1-3 Credit.**

Study of special topics in Art History and Archaeology.

**AR\_H\_A 2150. The Art of the Book. 3 Credits.**

Introduction to the illustrated book as a locus of artistic style, cultural currency, and visual literacy.

**AR\_H\_A 2230. Introduction to the Arts of Islam. 3 Credits.**

Architecture, decorative arts and painting of the Muslim world from the seventh to the 19th century. The formation of Islamic art and its relationships with religion, philosophy and symbolism.

**AR\_H\_A 2410. Ancient Technology. 3 Credits.**

Engineering, architecture, and military technology in the ancient world.

**AR\_H\_A 2720. African-American Visual Culture. 3 Credits.**

(Same as Black Studies [BL\_STU] 2720) This course introduces students to African-American art history, visual culture, and material culture in the cultural, political, and historical contexts. Specific focuses may include Harlem Renaissance, the Black Arts Movement, and other topics.

**AR\_H\_A 2830. American Art and Architecture. 3 Credits.**

Architecture, sculpture, painting of America from 17th century to present day.

**AR\_H\_A 2850. Introduction to Visual Culture. 3 Credits.**

Introduction to the problems of understanding, analyzing, and writing about visual culture.

**AR\_H\_A 2860. The Lives of Objects. 3 Credits.**

Introduction to the problems of understanding, analyzing and writing about art history and material culture.

**AR\_H\_A 2940. Archaeological Methods. 2-6 Credit.**

Methods of excavating various types of sites; recording, preserving their materials. Prerequisite: instructor's consent.

**AR\_H\_A 3005. Topics in Art History and Archaeology- Humanities. 1-3 Credit.**

Selected studies in various facets of art history and archaeology.  
Prerequisite: Art History and Archaeology [AR\_H\_A] 1110, 1120, 2830 as appropriate.

**AR\_H\_A 3005H. Topics in Art History and Archaeology- Humanities - Honors. 1-3 Credit.**

Selected studies in various facets of art history and archaeology.  
Prerequisite: AR\_H\_A 1110, AR\_H\_A 1120, AR\_H\_A 2830 as appropriate. Honor Eligibility Required.

**AR\_H\_A 3120. Art and Gender in Antiquity. 3 Credits.**

Comparative survey of art and archaeology in Egypt, Greece, and Rome to understand how societies constructed gender through material resources and how cultural perceptions of gender affected individual lives and behaviors. Emphasis on research methods and evaluation of sources.

**AR\_H\_A 3210. Near Eastern and Egyptian Art and Archaeology. 3 Credits.**

General survey of material culture of the Near East and Egypt from the earliest times to the early Iron Age. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or equivalent.

**AR\_H\_A 3310. Greek Art and Archaeology. 3 Credits.**

General survey of material culture in Greece from earliest times to the Hellenistic period. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or equivalent.

**AR\_H\_A 3410. Roman Art and Archaeology. 3 Credits.**

General survey of material culture in the Roman world from earliest times through the 3rd century. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or equivalent.

**AR\_H\_A 3510. Byzantine and Islamic Art and Archaeology. 3 Credits.**

General survey of the visual world of the Middle Ages in southwest Asia and the east Mediterranean, from late antiquity through the rise of the Ottoman empire. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or equivalent.

**AR\_H\_A 3520. Early Medieval Art and Archaeology. 3 Credits.**

An investigation of the arts of western Europe during the first millennium, when the unifying traditions of Rome were transformed by the diverse cultures of her Northern neighbors. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or equivalent.

**AR\_H\_A 3530. Late Medieval Art. 3 Credits.**

General survey of the art and architecture of Europe from Charlemagne through the 14th century. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or equivalent.

**AR\_H\_A 3620. Italian Renaissance Art. 3 Credits.**

General survey of the architecture, painting and sculpture of Italy from the 14th through the 16th century. Prerequisite: Art History and Archaeology [AR\_H\_A] 1110 or 1120 or equivalent.

**AR\_H\_A 3630. Northern Renaissance Art. 3 Credits.**

General survey of the art and architecture of Northern Europe from the 14th through the 16th century. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or equivalent.

**AR\_H\_A 3640. Baroque Art. 3 Credits.**

General survey of 17th century European architecture, painting and sculpture. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or equivalent.

**AR\_H\_A 3720. Cities in the Western Imagination. 3 Credits.**

Interdisciplinary introduction to the forms, functions, and meanings of cities in Europe and the Americas from ancient to modern times; plans and predictions for the future also considered. Emphasis is placed on cities as fields for imaginative activity on the part of those who have designed, built, used, and interpreted them.

**AR\_H\_A 3730. Eighteenth Century European Art. 3 Credits.**

General survey of 18th-century European painting, sculpture and architecture. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or equivalent.

**AR\_H\_A 3740. Nineteenth Century European Art. 3 Credits.**

General survey of 19th-century European painting, sculpture and architecture. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or equivalent.

**AR\_H\_A 3750. Modern Art in Europe and America. 3 Credits.**

General survey of international directions in painting, sculpture, and architecture from 1885 to ca. 1940. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or equivalent.

**AR\_H\_A 3760. Contemporary Art. 3 Credits.**

General survey of painting, sculpture, and architecture from the Second World War to the present. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or equivalent.

**AR\_H\_A 3775. The Ancient World on Film. 3 Credits.**

(Same as Classical Humanities [CL\_HUM] 3775 and Film Studies [FILM\_S] 3775) This course explores how classical antiquity has been represented in twentieth and twenty-first-century film, with particular emphasis on the ways in which ancient narratives and iconography have been appropriated by filmmakers to address contemporary cultural issues. Prerequisite: Prior 2000 level coursework in CL\_HUM, AR\_H\_A, or FILM\_S. Instructors consent required.

**AR\_H\_A 3780. Architecture in Film. 3 Credits.**

(Same as Film Studies [FILM\_S] 3780) Filmmakers use architecture to convey meaning on symbolic, psychological, and ideological levels. Using architectural history and theory, in conjunction with weekly film screenings from a variety of genres, this course explores how architecture operates within film.

**AR\_H\_A 3785. Arts and Artists on Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3785) This course explores representations of art and artists in film, including documentary films, fictionalized films, and films made by artists.

**AR\_H\_A 3830. American Art and Culture, 1500-1820. 3 Credits.**

General survey of American visual culture - painting, sculpture, architecture-between 1500 and 1820. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or 2830 or equivalent.

**AR\_H\_A 3840. American Art and Culture, 1820-1913. 3 Credits.**

General survey of American visual culture - painting, sculpture, architecture, photography - between 1820-1913. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or 2830 or equivalent.

**AR\_H\_A 3850. American Art and Culture, 1913-Present. 3 Credits.**

General survey of American visual culture - painting, sculpture, architecture, photography, advertising, film, new media - between 1913

and the present. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 or 2830 or equivalent.

**AR\_H\_A 4005. Topics in Art History and Archaeology-Humanities. 1-99 Credit.**

Special studies in art history/archaeology; covers subjects not included in regularly offered courses. Prerequisite: instructor's consent.

**AR\_H\_A 4120. Women, Art and Society. 3 Credits.**

(same as Women and Gender Studies [WGST] 4120). Analysis of the careers and works of women artists, and images of women (by female and male artists), in selected eras. Prerequisite: instructor's consent.

**AR\_H\_A 4320. Archaeology of the Aegean Bronze Age. 3 Credits.**

Analysis of the material culture of Greek prehistoric civilizations from 3000 to 1000 B.C. Prerequisite: instructor's consent.

**AR\_H\_A 4340. Greek Architecture. 3 Credits.**

Survey of the art of building in the Aegean and Classical world from earliest times to the Hellenistic period. Prerequisite: instructor's consent.

**AR\_H\_A 4350. Greek Pottery. 3 Credits.**

Examination of pottery and vase painting with an emphasis on production, iconography, and social context. Prerequisite: instructor's consent.

**AR\_H\_A 4360. Greek Sculpture. 3 Credits.**

Survey of sculptor's art in Aegean and Classical world from earliest times to Hellenistic period. Prerequisite: instructor's consent.

**AR\_H\_A 4420. Minor Arts of Antiquity. 3 Credits.**

Discussion of selected minor arts and crafts of the Greco-Roman world. Prerequisite: instructor's consent.

**AR\_H\_A 4440. Roman Architecture. 3 Credits.**

The history of Roman architecture, origin and development of forms and techniques, major monuments in Rome and its provinces through the 3rd century after Christ. Prerequisite: instructor's consent.

**AR\_H\_A 4460. Roman Sculpture. 3 Credits.**

The origins and development of sculpture in the Roman Republic and the Roman Empire. Prerequisite: instructor's consent.

**AR\_H\_A 4490. Late Antique Art and Archaeology. 3 Credits.**

Exploration of the material culture of the Mediterranean world from the 3rd century to Iconoclasm. Prerequisite: instructor's consent.

**AR\_H\_A 4510. Byzantine Art and Archaeology. 3 Credits.**

Historical investigation of Byzantine material culture in the eastern Mediterranean and Russia, from the outbreak of Iconoclasm to the Ottoman conquest. Prerequisite: instructor's consent.

**AR\_H\_A 4520. Art of the Dark Ages. 3 Credits.**

Survey of the visual arts of western Europe during the period of migrations, from the fall of Rome to the Carolingian renovation of the 9th century. Prerequisite: instructor's consent.

**AR\_H\_A 4530. Romanesque Art and Architecture. 3 Credits.**

Discussion of selected topics in architecture, sculpture and painting and their artistic and cultural relationship from ca. 800 to ca. 1150. Prerequisite: instructor's consent.

**AR\_H\_A 4540. Gothic Art and Architecture. 3 Credits.**

Discussion of selected topics in architecture, sculpture and painting and their artistic and cultural relationship from ca. 1150 to ca. 1400. Prerequisite: instructor's consent.

**AR\_H\_A 4620. Michelangelo and the High Renaissance. 3 Credits.**

Sculpture, architecture, paintings, and drawing of Michelangelo in the context of his times. Prerequisite: instructor's consent.

**AR\_H\_A 4630. The Renaissance Artist. 3 Credits.**

Lectures, readings, discussions and a research paper related to the Renaissance artist. Focus will be on representations of the artist in art and literature from ca. 1300 to ca. 1650. Prerequisite: instructor's consent.

**AR\_H\_A 4640. Renaissance and Baroque Architecture. 3 Credits.**

Problems in European architectural history from the 15th through the 18th century. Prerequisite: instructor's consent.

**AR\_H\_A 4650. Venetian Painting. 3 Credits.**

Survey of Venetian Painting from the 14th through the 18th century. Prerequisite: instructor's consent.

**AR\_H\_A 4660. Renaissance Figural Arts of Northern Europe. 3 Credits.**

Discussion of selected topics in painting and sculpture and their artistic and cultural relationships from the fourteenth through the sixteenth century in northern Europe. Prerequisite: instructor's consent.

**AR\_H\_A 4670. Baroque Figural Arts. 3 Credits.**

Painting and sculpture of Italy in the 17th century. Prerequisite: instructor's consent.

**AR\_H\_A 4710. The Arts of the Rococo. 3 Credits.**

This course explores European Art from approximately 1710 to 1770, focusing on art associated with two different social sectors: The early modern aristocratic court culture whose artistic predilections had formed the European norm, and the increasingly powerful merchant classes whose newfound wealth enabled new artistic genres and styles to proliferate. Our inquiry begins with an exploration of the rococo as an ornamental style; we examine its origins in Italian garden architecture and subsequent transformation into a decoration for both French palatial interiors and German Churches. We then launch a succession of case studies of important artists, media, and objects in order to assess the varied ways that diverse social identities were deflected through the periods' art and architecture. Students will pursue a research topic on rococo art for their semester project. Prerequisite: Art History and Archaeology [AR\_H\_A] 3730; consent of instructor.

**AR\_H\_A 4720. Revolution and Romanticism: Art C. 1800. 3 Credits.**

This course examines European art from circa 1780 to 1820, focusing on art made in conjunction with the major events of the French Revolution, its aftermath, and its global repercussions. Prerequisite: Art History and Archeology [AR\_H\_A] 3730 or 3740; instructor's consent. May be repeated for credit.

**AR\_H\_A 4730. Realism Through Post-Impressionism. 3 Credits.**

Styles and issues in nineteenth-century art. Prerequisite: instructor's consent.

**AR\_H\_A 4740. Modern Architecture. 3 Credits.**

Problems in the history of architecture from the late 18th century to the present. Prerequisite: instructor's consent.

**AR\_H\_A 4750. Contemporary World Architecture. 3 Credits.**

This course will study key themes, events, and figures in architectural theory and practice from around the world since the 1960s. As with any course treating such a large body of material, this one will be selective topical rather than comprehensive in nature. The format will include lectures, discussions based on reading, writing, and research assignments, films, and field trips. Prerequisite: Art History and

Archeology [AR\_H\_A] 1120; instructor's consent. Graded on A/F basis only.

**AR\_H\_A 4760. Modern Sculpture. 3 Credits.**

Sculpture in Europe and the U.S. ca. 1880 to the present, with special emphasis on changing definitions of the medium. Prerequisite: instructor's consent.

**AR\_H\_A 4780. Advanced Course in Contemporary Art. 3 Credits.**

Topics in European and American painting and sculpture after 1950. Prerequisite: instructor's consent.

**AR\_H\_A 4820. American Material Culture. 3 Credits.**

An exploration of American material culture from a multidisciplinary perspective. Prerequisite: instructor's consent.

**AR\_H\_A 4840. American Architecture. 3 Credits.**

An exploration of architecture and urbanism from the colonial period to the present. Prerequisite: instructor's consent.

**AR\_H\_A 4960. Special Readings in Art History and Archaeology. 1-3 Credit.**

Independent readings and research selected in consultation with supervisory faculty. Prerequisite: instructor's consent.

**AR\_H\_A 4970. Capstone: Art History and Archaeology. 1 Credit.**

Students will write an expanded, guided research paper. The Capstone student will consult on a regular basis with the professor responsible for the course and will make an oral presentation of the paper in the course. Must be taken in conjunction with a 4000-level Art History and Archaeology course. Instructor's consent.

**AR\_H\_A 4980. Internship. 3 Credits.**

A one-semester or full summer intensive internship for departmental majors with specific projects and responsibilities to be arranged by the student in cooperation with a faculty member and an appropriate agent of the museum involved. May be taken as an elective only. May be repeated for a maximum of 6 hours credit. Instructor's consent.

**AR\_H\_A 4996. Honors Proseminar I. 3 Credits.**

Research methods, bibliography, use and criticism of source material. Prerequisite: instructor's consent.

**AR\_H\_A 4999. Honors Reading and Research I. 3 Credits.**

Individual research projects in preparation of senior thesis. Prerequisite: Art History and Archaeology [AR\_H\_A] 4996 and instructor's consent.

**AR\_H\_A 7005. Topics in Art History and Archaeology. 1-99 Credit.**

Special studies in art history or archaeology; covers subjects not included in regularly offered courses. Instructor's consent.

**AR\_H\_A 7120. Women, Art and Society. 3 Credits.**

(same as Women and Gender Studies [WGST] 7120). Analysis of the careers and works of women artists, and images of women (by female and male artists), in selected eras. Prerequisite: instructor's consent.

**AR\_H\_A 7130. Museum Studies. 3 Credits.**

Functions and history of museums and interrelations among departments, including those of director, curator, registrar, education, conservation, and marketing. Topics include acquisitions policies; public outreach; role of architecture; and philosophical and legal issues pertaining to administration of museums. Prerequisite: instructor's consent.

**AR\_H\_A 7170. Historic Preservation. 3-9 Credit.**

(same as History [HIST] 7450). Survey of the historic preservation movement and techniques by faculty and guest speakers active in the field. Prerequisite: instructor's consent.

**AR\_H\_A 7320. Archaeology of the Aegean Bronze Age. 3 Credits.**

Analysis of the material culture of Greek prehistoric civilizations from 3000 to 1000 B.C. Prerequisite: instructor's consent.

**AR\_H\_A 7340. Greek Architecture. 3 Credits.**

Survey of the art of building in the Aegean and Classical world from earliest times to the Hellenistic period. Prerequisite: instructor's consent.

**AR\_H\_A 7350. Greek Pottery. 3 Credits.**

Examination of pottery and vase painting with an emphasis on production, iconography, and social context. Prerequisite: graduate standing and instructor's consent.

**AR\_H\_A 7360. Greek Sculpture. 3 Credits.**

Survey of sculptor's art in Aegean and Classical world from earliest times to Hellenistic period. Prerequisite: instructor's consent.

**AR\_H\_A 7420. Minor Arts of Antiquity. 3 Credits.**

Discussion of selected minor arts and crafts of the Greco-Roman world. Prerequisite: instructor's consent.

**AR\_H\_A 7440. Roman Architecture. 3 Credits.**

The history of Roman architecture, origin and development of forms and techniques, major monuments in Rome and its provinces through the 3rd century after Christ. Prerequisite: instructor's consent.

**AR\_H\_A 7460. Roman Sculpture. 3 Credits.**

The origins and development of sculpture in the Roman Republic and the Roman Empire. Prerequisite: graduate standing and instructor's consent.

**AR\_H\_A 7490. Late Antique Art and Archaeology. 3 Credits.**

Exploration of the material culture of the Mediterranean world from the 3rd century to Iconoclasm. Prerequisite: instructor's consent.

**AR\_H\_A 7510. Byzantine Art and Archaeology. 3 Credits.**

Historical investigation of Byzantine material culture in the eastern Mediterranean and Russia, from the outbreak of Iconoclasm to the Ottoman conquest. Prerequisite: instructor's consent.

**AR\_H\_A 7520. Art of the Dark Ages. 3 Credits.**

Survey of the visual arts of western Europe during the period of migrations, from the fall of Rome to the Carolingian renovation of the 9th century. Prerequisite: instructor's consent.

**AR\_H\_A 7530. Romanesque Art and Architecture. 3 Credits.**

Discussion of selected topics in architecture, sculpture and painting and their artistic and cultural relationship from ca. 800 to ca. 1150. Prerequisite: instructor's consent.

**AR\_H\_A 7540. Gothic Art and Architecture. 3 Credits.**

Discussion of selected topics in architecture, sculpture and painting and their artistic and cultural relationship from ca. 1150 to ca. 1400. Prerequisite: instructor's consent.

**AR\_H\_A 7620. Michelangelo and the High Renaissance. 3 Credits.**

Sculpture, architecture, paintings, and drawings of Michelangelo in the context of his times. Prerequisite: instructor's consent.

**AR\_H\_A 7630. The Renaissance Artist. 3 Credits.**

Lectures, readings, discussions and a research paper related to the Renaissance artist. Focus will be on representations of the artist in art and literature from ca. 1300 to ca. 1650. Prerequisite: instructor's consent.

**AR\_H\_A 7640. Renaissance and Baroque Architecture. 3 Credits.**

Problems in European architectural history from the 15th through the 18th century. Prerequisite: departmental consent.

**AR\_H\_A 7650. Venetian Painting. 3 Credits.**

Survey of Venetian painting from the 14th through the 18th century. Prerequisite: instructor's consent.

**AR\_H\_A 7660. Renaissance Figural Arts of Northern Europe. 3 Credits.**

Discussion of selected topics in painting and sculpture and their artistic and cultural relationships from the fourteenth through the sixteenth century in northern Europe. Prerequisite: graduate standing and instructor's consent.

**AR\_H\_A 7670. Baroque Figural Arts. 3 Credits.**

Painting and sculpture of Italy in the 17th century. Prerequisite: instructor's consent.

**AR\_H\_A 7710. The Arts of the Rococo. 3 Credits.**

This course explores European art from 1710 to 1770, beginning with an exploration of the rococo as an ornamental language and then moving to case studies of artists, media, and objects in order to assess how social identities were expressed through design. Prerequisites: Art History and Archaeology [AR\_H\_A] 8110 and consent of instructor.

**AR\_H\_A 7720. Revolution and Romanticism: Art Circa 1800. 3 Credits.**

This course examines European art from circa 1780 to 1820, focusing on art made in conjunction with the major events of the French Revolution, its aftermath, and its global repercussions. Prerequisite: Art History and Archaeology [AR\_H\_A] 8110 and consent of instructor. Graduate Standing Required.

**AR\_H\_A 7730. Realism Through Post-Impressionism. 3 Credits.**

Styles and issues in nineteenth-century art. Prerequisite: instructor's consent.

**AR\_H\_A 7740. Modern Architecture. 3 Credits.**

Problems in the history of architecture from the late 18th century to the present. Prerequisite: instructor's consent.

**AR\_H\_A 7750. Contemporary World Architecture. 3 Credits.**

This course will study key themes, events, and figures in architectural theory and practice from around the world since the 1960s. As with any course treating such a large body of material, this one will be selective, topical rather than comprehensive in nature. The format will include lectures, discussions based on reading, writing, and research assignments, films and field trips. Prerequisite: Art History and Archaeology [AR\_H\_A] 1120 and instructor's consent. Graded A-F only.

**AR\_H\_A 7760. Modern Sculpture. 3 Credits.**

Sculpture in Europe and the U.S. ca. 1880 to the present, with special emphasis on changing definitions of the medium. Prerequisite: departmental consent.

**AR\_H\_A 7780. Advanced Course in Contemporary Art. 3 Credits.**

Topics in European and American painting and sculpture after 1950. Prerequisite: instructor's consent.

**AR\_H\_A 7820. American Material Culture. 3 Credits.**

An exploration of American material culture from a multidisciplinary perspective. Prerequisite: instructor's consent.

**AR\_H\_A 7840. American Architecture. 3 Credits.**

An exploration of architecture from the colonial period to the present. Prerequisite: instructor's consent.

**AR\_H\_A 7940. Archaeological Methods. 2-6 Credit.**

Methods of excavating various types of sites; recording, preserving their materials. Prerequisite: instructor's consent.

**AR\_H\_A 7960. Special Readings in Art History or Archaeology. 1-99 Credit.**

Independent readings and research selected in consultation with supervisory faculty. Prerequisite: instructor's consent.

**AR\_H\_A 7980. Internship in Art History and Archaeology. 3 Credits.**

A one semester or full summer intensive internship with specific projects and responsibilities to be arranged by the student and the program director. Prerequisite: instructor's consent.

**AR\_H\_A 8070. Master's Tutorial. 1 Credit.**

Consultation with faculty advisory and preparation of a scholarly essay based on a graduate research paper. Prerequisite: Art History and Archaeology [AR\_H\_A] 8110, and other graduate courses in Art History & Archaeology. Graded on S/U basis only.

**AR\_H\_A 8080. Readings for MA Thesis in Art History and Archaeology. 1-99 Credit.**

Reading, critical evaluation of literature of special fields of art history and/or archaeology. Prerequisite: instructor's consent.

**AR\_H\_A 8090. Master's Thesis Research and Thesis. 1-99 Credit.**

Individual research leading to preparation of the M.A. thesis. Graded on a S/U basis only. Prerequisite: instructor's consent.

**AR\_H\_A 8110. Introduction to Graduate Study. 3 Credits.**

Research methods, bibliography, use and criticism of source material. Required of graduate students in Art History and Archaeology who have not had Art History and Archaeology [AR\_H\_A] 4996. Prerequisite: departmental consent.

**AR\_H\_A 8120. Theories and Methodologies in Art History and Archaeology. 3 Credits.**

Literature of art and archaeology in terms of works of leading European and American art historians, archaeologists. Prerequisite: instructor's consent.

**AR\_H\_A 8130. Museum Studies Seminar. 3 Credits.**

Appropriate means for care and display of artifacts. Topics include: accessioning, cataloging, retrieval of information, and laws and ethics of collecting; the museum environment and its monitoring; condition reports, shipping and storage, and conservation. Field trips. Prerequisite: instructor's consent.

**AR\_H\_A 8140. Art Theory and Criticism. 3 Credits.**

Theoretical and critical literature of art from earliest times to the present. Prerequisite: instructor's consent.

**AR\_H\_A 8170. Historic Preservation Seminar. 3 Credits.**

Research techniques to solve research problems and conduct field recording in historic preservation, material culture, historic architecture, and cultural heritage studies. Prerequisite: instructor's consent.

**AR\_H\_A 8320. Seminar in Greek Art and Archaeology. 1-99 Credit.**

Special subjects of study assigned for individual research; discussion of reports by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8420. Seminar in Roman Art and Archaeology. 1-99 Credit.**

Special subjects of study assigned for individual research; discussion of reports by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8440. Ancient/Medieval Topography. 1-99 Credit.**

(same as CLASS 8440). Descriptive and historical analysis of a selected city or site. Subject varies. Prerequisite: instructor's consent.

**AR\_H\_A 8490. Seminar in Late Antique Art and Archaeology. 3 Credits.**

Special subjects of study assigned for individual research; discussion of reports by seminar members. Prerequisite: AR\_H\_A 7490 or equivalent.

**AR\_H\_A 8520. Seminar in Medieval Art and Archaeology. 1-99 Credit.**

Specific subjects of study will be assigned to students for presentation in relation to broader questions of the cultural/ historical phenomena of the time, from ca 700 to ca 1400. Prerequisite: instructor's consent.

**AR\_H\_A 8620. Seminar in Renaissance Art. 3 Credits.**

Special subjects of study assigned for Northern or Southern Renaissance for individual research, discussion of reports by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8710. Seminar in 18th Century Art. 1-99 Credit.**

Special subjects of study in 18th century art assigned for individual research; reports to be presented and discussed by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8720. Seminar in 19th Century Art. 1-99 Credit.**

Special subjects of study in 19th century art assigned for individual research; reports to be presented and discussed by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8740. Seminar in Modern Architecture. 1-99 Credit.**

Special subjects of study assigned for individual research; discussion of reports by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8750. Seminar in Modern and Contemporary Art. 1-99 Credit.**

Special subjects of study assigned for individual research; discussion of reports by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 8800. Seminar in American Art. 1-99 Credit.**

Special subjects of study assigned for individual research; discussion of reports by seminar members. Prerequisite: instructor's consent.

**AR\_H\_A 9080. Readings for PhD Dissertation in Art History and Archaeology. 1-99 Credit.**

Reading, critical evaluation of literature of special fields of art history and/or archaeology. Prerequisite: instructor's consent.

**AR\_H\_A 9090. Doctoral Dissertation Research in Art History and Archaeology. 1-99 Credit.**

Individual research leading to preparation of the Ph.D. dissertation. Graded on a S/U basis only. Prerequisite: instructor's consent.

## **Art-Ceramics (ART\_CERM)**

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**ART\_CERM 2100. Beginning Ceramics. 3 Credits.**

Exploration of ceramic art as an expressive, communicative medium. Study of ceramic design, technique and historic and contemporary models within the context of the creative process. Group critiques, slides, demonstrations. Expendable materials fee. Prerequisite: instructor's consent.

**ART\_CERM 3100. Intermediate Ceramics. 3 Credits.**

Continuation of ART\_CERM 2100 with emphasis on wheel throwing and the vessel format. Further exploration of glazing and firing techniques. Group and individual critiques, demonstrations, slide lectures and visiting artists. Expendable materials fee. Prerequisite: instructor's consent.

**ART\_CERM 4100. Advanced Ceramics. 3 Credits.**

Continuation of ART\_CERM 3100. Includes advanced problems in firing, clay and glaze technology, forming and ornamentation. Payment of expendable materials fee required. Prerequisite: instructor's consent. May be repeated to 15 hours maximum.

**ART\_CERM 4110. Ceramics Sculpture. 3 Credits.**

Sculptural forms constructed of slabs, coils and wheel-thrown elements. Payment of expendable materials expense is required. Prerequisite: ART\_CERM 4100. May be repeated to 15 hours maximum.

**ART\_CERM 4185. Problems in Ceramics. 1-3 Credit.**

Prerequisites: departmental consent.

**ART\_CERM 7100. Graduate Ceramics. 3 Credits.**

Advanced study of ceramic technology and design concepts with emphasis on directed development of individual work. Payment of expendable materials expense is required. Prerequisite: ART\_CERM 4100. May be repeated to 18 hours maximum.

**ART\_CERM 7110. Graduate Ceramic Sculpture. 3 Credits.**

Directed development of individual work. Payment of expendable materials expense is required. Prerequisite: ART\_CERM 4100. May be repeated to 18 hours maximum.

**ART\_CERM 7185. Problems in Ceramics. 1-3 Credit.**

Graduate level work in ceramics. Prerequisites: graduate standing and ART\_CERM 7100 and 7110 and departmental consent.

**ART\_CERM 8100. Graduate Ceramics II. 3 Credits.**

Continuation of ART\_CERM 7100 Graduate Ceramics. Prerequisites: ART\_CERM 7100 or equivalent and graduate standing. Repeatable to 15 hours.

## **Art-Drawing (ART\_DRAW)**

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**ART\_DRAW 1050. Drawing I. 3 Credits.**

An introduction to visual hierarchy, composition, and pictorial space in drawing. Emphasis on linear perspective and the language of light and shadow using black and white media (graphite, charcoal and/or conte crayon). Development of skills and concepts in drawing based on historical models, lectures, demonstrations and critiques. Expendable materials fee required.

**ART\_DRAW 2200. Drawing II. 3 Credits.**

An introduction to drawing systems, problem solving and study of the proportions of the human form. Development of skills and concepts in drawing based on historical and contemporary models, lectures, demonstrations and critiques. Prerequisite: ART\_DRAW 1050. Expendable materials fee required.

**ART\_DRAW 2210. Beginning Color Drawing. 3 Credits.**

Theory and practice in the use of pastel working from stilllife, landscape, and portrait. Expendable materials fee required. Prerequisites: ART\_DRAW 1050.

**ART\_DRAW 3200. Drawing III. 3 Credits.**

Development of drawing techniques with an emphasis on materials and methods. Emphasis in conceptual and formal skills based on contemporary and historical models. May be repeated to 15 hours maximum. Expendable materials fee required. Prerequisite: ART\_DRAW 1050 and 2200.

**ART\_DRAW 3210. Intermediate Color Drawing. 3 Credits.**

Continuation of Art-Drawing 2210 with emphasis on design and organization. Expendable materials fee required. Prerequisite: ART\_DRAW 1050 and 2210.

**ART\_DRAW 3220. Anatomical Drawing. 3 Credits.**

Anatomical structure of human figure as it relates to art. Drawing from live model; emphasis on gross anatomy as defined by skeletal and muscular structure. Expendable materials fee required. Prerequisites: ART\_DRAW 1050 and either 2200 or instructor's consent.

**ART\_DRAW 3230. Beginning Illustration. 3 Credits.**

An introduction to visual problem solving from initial concept through final execution. Emphasis in drawing and painting skills and exploration of mixed media techniques including drawing from the model. Graded on A/F basis only. Expendable materials fee. Prerequisites: ART\_DRAW 1050 and 2200.

**ART\_DRAW 4200. Drawing IV. 3 Credits.**

This course will provide an intensive experience in the development of a portfolio of artwork. Students will explore the connections between their work and contemporary art. May be repeated 3 times. Expendable Materials Fee Required. Prerequisite: ART\_DRAW 1050, 2200 and 3200.

**ART\_DRAW 4210. Advanced Color Drawing. 3 Credits.**

Continuation of Art-Drawing 3210 with emphasis on the expressive properties of color in figural compositions. Repeatable to 15 hours. Expendable materials fee required. Prerequisites: ART\_DRAW 1050, 2210 and 3210.

**ART\_DRAW 4220. Advanced Anatomical Drawing. 3 Credits.**

Continuation of Art-Drawing 3220, Anatomical Drawing, with and emphasis on formal analysis of the figure in drawing based on superficial and deep anatomical structure. May be repeated to 15 hour maximum. Expendable materials fee required. Prerequisites: ART\_DRAW 1050 and 3220. It is also recommended to take ART\_DRAW 2200 and 3200 before taking this class.

**ART\_DRAW 4230. Advanced Illustration. 3 Credits.**

Further development of conceptual problem solving skills and technical proficiency through self generated assignments. Emphasis is placed on portfolio development by exploring sequential and narrative themes. Topics include contract, copyrights, and the art of freelancing. Students are advised to take the course a minimum of two times. May be repeated to 15 hours maximum. Expendable materials fee required. Prerequisites: ART\_DRAW 1050, 2200 and 3230.

**ART\_DRAW 4285. Problems in Drawing. 1-3 Credit.**

Prerequisites: departmental consent.

**ART\_DRAW 7200. Graduate Drawing. 3 Credits.**

Continuation of ART\_DRAW 4200 with emphasis on individual creative expression. Prerequisites: ART\_DRAW 4200 and graduate Art major. May repeat to 15 hours maximum. Expendable materials fee required.

**ART\_DRAW 7210. Graduate Color Drawing. 3 Credits.**

Continuation of ART\_DRAW 4210 with emphasis on individual creative expression. Prerequisites: ART\_DRAW 4210, instructor's consent or graduate standing. Repeatable to 15 hours. Expendable materials fee required.

**ART\_DRAW 7285. Problems in Drawing. 1-3 Credit.**

Prerequisites: graduate standing and ART\_DRAW 7200 and departmental consent.

**ART\_DRAW 8200. Graduate Drawing II. 3 Credits.**

Continuation of ART\_DRAW 7200 Graduate Painting. Prerequisite: ART\_DRAW 7200 or equivalent and graduate standing. Repeatable to 15 hours.

**ART\_DRAW 8210. Graduate Color Drawing II. 3 Credits.**

Continuation of ART\_DRAW 7210 Graduate Color Drawing. Prerequisite: ART\_DRAW 7210 or equivalent and graduate standing. Repeatable to 15 hours.

**ART\_DRAW 8285. Problems in Drawing II. 1-3 Credit.**

Advanced independent studio practice including critical evaluation of student's creative work. Individual study in drawing is to be proposed by the student and approved by the instructor. The student will meet on a regular basis with the instructor to review student progress. May be repeated for credit. Prerequisite: graduate standing for students with strong preparation in Art; departmental consent; Art-Drawing [ART\_DRAW] 7285. Graded on A/F basis only.

## Art-Fibers (ART\_FIBR)

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**ART\_FIBR 2300. Beginning Fibers. 3 Credits.**

Exploration of various fiber and media including papermaking, weaving, surface design and sculptural techniques. Expendable materials fee required. Prerequisite: ART\_FIBR 1030.

**ART\_FIBR 3300. Intermediate Fibers. 3 Credits.**

Continuation of Art-Fibers 2300 with emphasis on utilizing acquired technical processes in loom and off weaving, paper making and surface design and a means of developing visual statements. Expendable materials fee required. Prerequisite: ART\_FIBR 2300.

**ART\_FIBR 4300. Advanced Fibers. 3 Credits.**

Exploration of aesthetic concepts, development of personal style and instruction in advanced fiber techniques within medium selected by student. Expendable materials fee required. Prerequisites: ART\_FIBR 3300 or approved equivalents. May repeat to 15 hours maximum.

**ART\_FIBR 4385. Problems in Fibers. 1-3 Credit.**

Prerequisites: departmental consent.

**ART\_FIBR 7300. Graduate Fibers. 3 Credits.**

Advanced technical and aesthetic study in medium of choice with emphasis on development of the individual student's ideas and goals. Expendable materials fee required. Prerequisites: ART\_FIBR 4300 and graduate standing. May repeat to 15 hours maximum.

**ART\_FIBR 7385. Problems in Fibers. 1-3 Credit.**

Graduate level work in fibers. Prerequisites: graduate standing and ART\_FIBR 7300 and departmental consent.

**ART\_FIBR 8300. Graduate Fibers II. 3 Credits.**

Continuation of ART\_FIBR 7300 Graduate Fibers. Prerequisites: ART\_FIBR 7300 or equivalent and graduate standing. Repeatable to 15 hours.

## Art-General (ART\_GNRL)

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**ART\_GNRL 1010. Introduction to Art. 3 Credits.**

Basic practice in drawing, painting, design. Exploratory course for beginners. Non-majors only.

**ART\_GNRL 1020. Appreciation of Art. 3 Credits.**

Illustrated discussion with examples from varied historic and contemporary art fields on nature of art, functions, methods of creative expression. One section is writing intensive each semester and the other is NON writing intensive each semester.

**ART\_GNRL 1030. Basic 2-D Design. 3 Credits.**

Basic study of line, shape and texture; their use and control according to the basic variables and the principles of design. Two dimensional exercises employing a variety of tools and materials.

**ART\_GNRL 1040. Basic 3-D Design. 3 Credits.**

A foundational course designed to familiarize students with the elements and principles of three-dimensional design as well as some of the materials, tools, processes and techniques used in the creation of sculptural art. Study and development of formal aesthetic ideas, conceptual vocabulary and technical skills is emphasized. Expendable materials fee required.

**ART\_GNRL 2000. Color Theory. 3 Credits.**

An investigation of various color systems and their application to art. Prerequisites: ART\_GNRL 1030 or its equivalent, and sophomore standing.

**ART\_GNRL 2001. Topics in Art. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics course are repeatable for up to 6 credits per individual topic. Prerequisite: instructor's consent.

**ART\_GNRL 2001H. Topics in Art - Honors. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisite: instructor's consent. Honors eligibility required.

**ART\_GNRL 2005. Topics in Art - Humanities. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to six credits per individual topic. Prerequisite: Instructor's consent.

**ART\_GNRL 2005H. Topics in Art - Humanities - Honors. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to six credits per individual topic. Prerequisite: Instructor's consent. Honors eligibility required.

**ART\_GNRL 2020. International Summer Study Abroad. 4 Credits.**

A four-week study abroad in studio art with required participation in scheduled excursions to art-related sites. Students create original art for review at schedule critiques in 1) Florence, Italy and surrounding cities, or 2) The Netherlands and Belgium. May be repeated once for credit.

**ART\_GNRL 2030. Context and Culture. 3 Credits.**

The purpose of this course is to give journalism students a framework for engaging with the visual arts, with a focus on the 20th century and today. Our goal is to conduct a foundation for thinking, talking and writing about the visual arts, especially works and movements that might be challenging for the novice to understand. Prerequisite: instructor's consent.

**ART\_GNRL 2030H. Context and Culture - Honors. 3 Credits.**

The purpose of this course is to give journalism students a framework for engaging with the visual arts, with a focus on the 20th century and today. Our goal is to conduct a foundation for thinking, talking and writing about the visual arts, especially works and movements that might

be challenging for the novice to understand. Prerequisite: instructor's consent. Honors eligibility required.

**ART\_GNRL 3001. Topics in Art. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisites: junior standing and instructor's consent.

**ART\_GNRL 3001H. Topics in Art - Honors. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisites: instructor's consent. Honors eligibility required.

**ART\_GNRL 3005. Topics in Art - Humanities. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to six credits per individual topic. Prerequisite: Instructor's consent.

**ART\_GNRL 3005H. Topics in Art - Humanities Honors. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to six credits per individual topic. Prerequisite: Instructor's consent. Honors eligibility required.

**ART\_GNRL 3020. International Summer Study Abroad. 4 Credits.**

A four-week study abroad in studio art with required participation in scheduled excursions to art-related sites. Students create original art for review at scheduled critiques in 1) Florence, Italy and surrounding cities, or 2) The Netherlands and Belgium. May be repeated once for credit. Prerequisites: instructor's consent.

**ART\_GNRL 3030. Undergraduate Internship in Art. 1-3 Credit.**

Special learning situations not covered by coursework. Credit standards pre-arranged with dept. Prerequisites: junior standing and departmental consent. Open only to Art and Art Education majors. Limit on total hours of problems courses applies.

**ART\_GNRL 4001. Topics in Art. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisite: consent of instructor.

**ART\_GNRL 4001H. Topics in Art - Honors. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisite: consent of instructor, honors eligibility required.

**ART\_GNRL 4005. Topics in Art - Humanities. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to six credits per individual topic. Prerequisite: Instructor's consent.

**ART\_GNRL 4005H. Topics in Art - Humanities Honors. 1-3 Credit.**

Special studies in studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to six credits per individual topic. Prerequisite: Instructor's consent. Honors eligibility required.

**ART\_GNRL 4030. Video Art and the Moving Image. 3 Credits.**

Video as a fine art form intersection sculpture, performing arts, doc filmmaking, pop culture and the Internet. Theoretical and historical knowledge is integrated with studio practice. Students create video works in Final Cut Pro demonstrating technical ability and aesthetic vision. May be repeated for credit.



**ART\_GNRL 4040. 2-D Portfolio Development. 3 Credits.**

This course will provide an intensive experience in the development of a portfolio of personal work outside the traditional media boundaries. Students will explore media relevant to their particular needs and begin to explore the connections between their work and contemporary art and culture through readings, discussions and critiques. Prerequisites: 3000-level or above course in one of the following media areas, Drawing, Painting or Printmaking. Expendable Materials Fee Required. Junior Standing and instructor's consent required. May be repeated t 6 credits.

**ART\_GNRL 4975. Senior Seminar in Art. 3 Credits.**

A capstone course for the undergraduate art degree with emphasis on the production of a written statement relating to the students' visual research. Prerequisite: senior standing.

**ART\_GNRL 4976. Design - Senior Seminar. 3 Credits.**

Capstone for undergraduate art students who are interested in graphic design. Emphasis placed on research and writing about the theory and practice of design. All students will participate in a final, formal portfolio review with outside evaluators. Prerequisite: senior standing.

**ART\_GNRL 7001. Topics in Art. 3 Credits.**

Special studies in studio art at the graduate level; covers subjects not included in regularly offered courses. Prerequisite: graduate standing and instructor's consent. Graded on A/F basis only.

**ART\_GNRL 7005. Topics in Art - Humanities. 1-3 Credit.**

Special studies in graduate level studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topics. Prerequisite: graduate standing and instructor's consent.

**ART\_GNRL 7020. International Summer Study Abroad. 4 Credits.**

A four-week study abroad in studio art with required participation in scheduled excursions to art-related sites. Students create original art for review at scheduled critiques in 1) Florence, Italy and surrounding cities, or 2) The Netherlands and Belgium. May be repeated for credit.

**ART\_GNRL 7030. Video Art and the Moving Image. 3 Credits.**

Video as a fine art form intersecting sculpture, performing arts, doc filmmaking, pop culture and the Internet. Theoretical and historical knowledge is integrated with studio practice. Students create video works in final Cut Pro demonstrating technical ability and aesthetic vision. May be repeated for credit.

**ART\_GNRL 7085. Problems in Art. 1-3 Credit.**

Individual study in a subject area to be proposed by the student and approved by the instructor. The student will meet periodically on a regular basis with the instructor to review progress on the work assigned. May be repeated for credit. Prerequisite: graduate standing for students with strong preparation in Art; departmental consent. Graded on A/F basis only.

**ART\_GNRL 8001. Topics in Art. 1-3 Credit.**

Special studies in graduate level studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisite: graduate standing and instructor's consent.

**ART\_GNRL 8005. Topics in Art - Humanities. 1-3 Credit.**

Special studies in graduate level studio art; covers subjects not included in regularly offered courses. Topics courses are repeatable for up to 6 credits per individual topic. Prerequisite: graduate standing and instructor's consent.

**ART\_GNRL 8020. International Summer Study Abroad. 4 Credits.**

A four week study abroad in studio art with required participation in scheduled excursion to art-related sites. Students create original art for review at schedule critiques in 1) Florence, Italy and surrounding cities, or 2) The Netherlands and Belgium. May be repeated once for credit. Prerequisite: graduate standing. Graded on A/F basis only.

**ART\_GNRL 8090. MFA Thesis Exhibition Documentation. 1 Credit.**

Preparation of materials deemed necessary to document in a permanent form the thesis exhibition. Credit will be granted upon the satisfactory completion of the document, which will be retained by the Department of Art. Required of all MFA candidates. Graded on S/U basis only.

**ART\_GNRL 9010. Graduate Studio Seminar. 1 Credit.**

Practical and philosophical concerns of the visual artist. Mandated for all MFA candidates. Prerequisites: graduate standing.

## **Art-Graphic Design (ART\_GRDN)**

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**ART\_GRDN 1400. Beginning Digital Imaging. 1 Credit.**

Class will cover the basic tools used in digital imaging software. A variety of different software may be offered. Course may be repeated for up to 3 hours with the consent of instructor. Graded on S/U basis only. Prerequisite: basic understanding of the Macintosh computer.

**ART\_GRDN 2400. Advanced Digital Imaging. 1 Credit.**

Class will cover the basic tools used in digital imaging software. A variety of different software may be offered. Course may be repeated for up to 3 hours with the consent of instructor. Graded on S/U basis only. Prerequisite: ART\_GRDN 1400, and a basic understanding of the Macintosh computer.

**ART\_GRDN 2410. Graphic Design I. 3 Credits.**

Emphasis on developing a design language and vocabulary. Projects explore visual images in two-dimensional space, each one focusing on a specific set of relationships. Introduction to methodological and research practices for designers. Payment of expendable materials fee is required. Prerequisite: ART\_GNRL 1030, 1040 and ART\_DRAW 1050.

**ART\_GRDN 2420. Graphic Design II. 3 Credits.**

Introduction to the discipline, function and tradition of typography. Topics include evolution and anatomy of typography, communication, legibility/readability, language sequence and information hierarchy. Course concludes with portfolio review for admission into Graphic Design III. Payment of expendable materials fee is required. Prerequisite: ART\_GRDN 2410.

**ART\_GRDN 2430. Introduction to Calligraphy. 3 Credits.**

Technical and historical instruction on five calligraphic alphabets. Application of hand lettering to both two and three-dimensional design projects. Emphasis placed on both technical mastery of letters and creative expression in projects. Prerequisite: ART\_GRDN 1030 and 1050 or instructor's consent.

**ART\_GRDN 3410. Graphic Design III. 3 Credits.**

Digital media and motion graphics are explored through the development of interactive presentations and web site design. Students experiment with the computer as a medium for delivery of communication. New, practical and conceptual skills will be discussed in order to develop meaningful, interactive user experiences. Payment of expendable materials fees is required. Prerequisite: ART\_GRDN 2420 and successful completion of the graphic design portfolio review.

**ART\_GRDN 3420. Graphic Design IV. 3 Credits.**

Goal directed graphic design problem solving stressing the integration of theory and practical applications while sharpening conceptual, computer, and research skills. Topics include current design theory, advanced typographic study, production methods and design/client interaction. Payment of expendable materials fee is required. Prerequisite: ART\_GRDN 3410.

**ART\_GRDN 3430. Advanced Calligraphy. 3 Credits.**

Technical and historical instruction to calligraphic alphabets including Uncial, Fraktur, Copperplate and Neuland. Application of hand lettering in two and three-dimensional design projects. Emphasis placed on both mastery of letters and creative exploration in projects. Prerequisite: Art-Graphic Design: ART\_GRDN 2430.

**ART\_GRDN 3440. Packaging Design. 3 Credits.**

This course will look at the discipline of packaging design from a three dimensional perspective. By gaining an understanding of the materials and processes that relate to packaging, students will develop a selection of packaging solutions for a variety of different clients. Payment of expendable material fee is required. Prerequisites: Successful completion of the graphic design portfolio review and/or instructor's consent.

**ART\_GRDN 3441. The History of Graphic Design. 3 Credits.**

Broad overview of the history of graphic design. Topics will range from the history of printing, the beginnings of the profession, major movements and developments to the practice of design. Also looks at how the history of design and printing apply to today's visual communication. Prerequisites: instructor's consent.

**ART\_GRDN 3442. Design for Corporate Identity and Branding. 3 Credits.**

Planning, strategy and design of the visual components necessary to create a corporate identity. Course will focus on how cohesive design programs function across various mediums and engage specific audiences. Payment of expendable materials fees is required. Prerequisites: successful completion of the graphic design portfolio review and/or instructor's consent.

**ART\_GRDN 3443. Letterpress. 3 Credits.**

This course is about creating conceptual design solutions using the letterpress printing process. Projects are very broad, conceptual and highly individual with the opportunity to explore letterpress printing processes using several different presses and printing techniques. Each project will require a limited edition print run. Repeatable to 9 hours. Instructor's consent required.

**ART\_GRDN 4410. Graphic Design V. 3 Credits.**

Directed research, study and critical analysis in graphic design. Emphasis placed on research, writing, problem solving, aesthetic perception, conceptual thinking skills and technical proficiency. Students will focus on portfolio preparation and are advised to take the course a minimum of two times. May be repeated to 15 hours maximum. Payment of expendable materials fee is required. Prerequisite: Art-Graphic Design [ART\_GRDN] 3420.

**ART\_GRDN 4485. Problems in Graphic Design. 1-3 Credit.**

Prerequisite: ART\_GRDN 4410, and departmental consent.

**ART\_GRDN 4996. Imprint - Design Practicum. 3 Credits.**

Class operates as professional design studio doing work for university, local and regional clients. Focus on client/designer relationships, contracts and teamwork. Students passing with grade in A range will graduate with departmental honors. Prerequisite: Admission based on

GPA (3.3 in art courses) and portfolio review; junior standing. May be repeated for credit.

**ART\_GRDN 7400. Graduate Graphic Design. 3 Credits.**

Graduate level work in graphic design. Emphasis on self-directed research and critical analysis. Students are encouraged to focus on conceptual development of their design work. Instruction is tailored to the student's individual investigations. Prerequisite: graduate standing and instructor's consent. Repeatable to 15 hours maximum.

**ART\_GRDN 7485. Problems in Graphic Design. 1-3 Credit.**

Graduate level work in graphic design. Prerequisite: graduate standing and ART\_GRDN 4410, and departmental consent.

**ART\_GRDN 8400. Graduate Graphic Design II. 3 Credits.**

Continuation of ART\_GRDN 7400 Graduate Graphic Design. Prerequisites: ART\_GRDN 7400 or equivalent and graduate standing. Repeatable to 15 hours.

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## Art-Painting (ART\_PNT)

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**ART\_PNT 2500. Beginning Painting. 3 Credits.**

Introduces primary techniques of painting. Emphasis on conceptualization of visual perception ( understanding how we see) and the creative processes (understanding how we create). Sections either in oil or acrylic; contact instructor. Expendable material fee required.

**ART\_PNT 2510. Beginning Watercolor Painting. 3 Credits.**

Theory, practice of painting in water color from still life, landscape, figure. Prerequisites: ART\_PNT 1050. Expendable materials fee required.

**ART\_PNT 3500. Intermediate Painting. 3 Credits.**

Continuation of ART\_PNT 2500 with the addition of portrait painting. Prerequisite: ART\_PNT 2500. Expendable materials fee required.

**ART\_PNT 3510. Intermediate Watercolor Painting. 3 Credits.**

Continuation of Art-Watercolor 2510, Beginning Watercolor, theory and practice of painting in watercolor. Expendable materials fee required. Prerequisite: ART\_PNT 2510.

**ART\_PNT 4500. Advanced Painting. 3 Credits.**

Advanced problems in oil and acrylic painting. Prerequisite: ART\_PNT 3500. May be repeated to 15 hours maximum. Expendable materials fee required.

**ART\_PNT 4510. Advanced Watercolor Painting. 3 Credits.**

Advanced problems in watercolor. Prerequisite: ART\_PNT 3510. May repeat to 15 hours maximum. Expendable materials fee required.

**ART\_PNT 4585. Problems in Painting. 1-3 Credit.**

Prerequisites: ART\_PNT 4500 and departmental consent.

**ART\_PNT 7500. Graduate Painting. 3 Credits.**

Advanced study continued. Emphasis on individual creative expression. Prerequisite: ART\_PNT 4500 and graduate Art major. May repeat to 15 hours maximum. Expendable materials fee required.

**ART\_PNT 7510. Graduate Watercolor Painting. 3 Credits.**

Advanced study in watercolor. Emphasis on individual creative expression. Prerequisites: ART\_PNT 4510 and graduate standing. May repeat to 15 hours maximum. Expendable materials fee required.

**ART\_PNT 7585. Problems in Painting. 1-3 Credit.**

Prerequisites: ART\_PNT 7500 and departmental consent.

**ART\_PNT 8500. Graduate Painting II. 3 Credits.**

Continuation of ART\_PNT 7500 Graduate Painting. Prerequisites: ART 7500 or equivalent and graduate standing. Repeatable to 15 hours.

**ART\_PNT 8510. Graduate Watercolor Painting. 3 Credits.**

Continuation of ART\_PNT 7510 Graduate Watercolor Painting. Prerequisites: ART\_PNT 7510 or equivalent and graduate standing. Repeatable to 15 hours.

**ART\_PNT 8585. Problems in Painting II. 1-3 Credit.**

Advanced independent studio practice including critical evaluation of student's creative work. Individual study in painting is to be proposed by the student and approved by the instructor. The student will meet on a regular basis with the instructor to review student progress. May be repeated for credit. Prerequisites: graduate standing for students with strong preparation in Art; departmental consent; ART\_PNT 7585. Graded on A/F basis only.

## Art-Photography (ART\_PHOT)

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**ART\_PHOT 2600. Beginning Photography. 3 Credits.**

Basic photography as an art form; camera and darkroom techniques; surveys photographic history and aesthetics. Camera with adjustable aperture and shutter required. Payment of expendable materials expense is required. Prerequisite: ART\_GNRL 1030, 1040, 1050 and instructor's consent required.

**ART\_PHOT 3600. Intermediate Photography. 3 Credits.**

Continuation of Art-Photography 2600 with emphasis utilizing acquired technical process to facilitate use of the camera as a means of developing awareness of immediate environment and the capabilities of Photography as a communicative, documentary, and expressive medium. Payment of expendable material fee is required. Prerequisite: ART\_PHOT 2600 or approved equivalent and consent required.

**ART\_PHOT 4600. Advanced Photography. 3 Credits.**

Exploration of aesthetic concepts, development of personal vision, and instruction in advanced technical process including fine B&W printing, negative and positive color, large format, zone system, and portfolios and book design to facilitate critical observation and personal expression through the medium of Photography. Payment of expendable materials fee is required. Prerequisites: ART\_PHOT 2600 and 3600 or approved equivalents, and consent required. May repeat to 15 hours maximum.

**ART\_PHOT 4685. Problems in Photography. 1-3 Credit.**

Supervised research in creative photography. Prerequisite: ART\_PHOT 4410 and departmental consent.

**ART\_PHOT 7600. Graduate Photography. 3 Credits.**

Advanced technical study with emphasis on development of the individual student's creative ideas. Payment of expendable materials expense is required. Prerequisites: ART\_PHOT 3600 and graduate standing and consent required. May repeat to 15 hours maximum.

**ART\_PHOT 7685. Problems in Photography. 1-3 Credit.**

Supervised research in creative photography. Prerequisite: ART\_PHOT 4410 and graduate standing.

**ART\_PHOT 8600. Graduate Photography II. 3 Credits.**

Continuation of ART\_PHOT 7600 Graduate Photography. Prerequisites: ART\_PHOT 7600 or equivalent and graduate standing. Repeatable to 15 hours.

## Art-Printmaking (ART\_PRNT)

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**ART\_PRNT 2700. Beginning Printmaking. 3 Credits.**

Introductory Relief, Intaglio and Lithography techniques in color and black and white including woodcut, linocut reduction, etching; aquatint, dry point, photo mechanics and pronto plate lithography. No prerequisites. May be repeated to six hours maximum. Expendable materials fee required.

**ART\_PRNT 2730. Serigraphy. 3 Credits.**

Introduces methods, materials, and techniques of printmaking with the silk screen. Payment of expendable materials expense is required. Prerequisites: ART\_GNRL 1030 and one semester of Drawing. May repeat to 6 hours maximum.

**ART\_PRNT 3700. Intermediate Printmaking. 3 Credits.**

Continuing work in litho, intaglio, relief or serigraphy. Expendable materials fee required. Prerequisites: ART\_PRNT 2700 and/or instructor's consent.

**ART\_PRNT 4700. Advanced Printmaking. 3 Credits.**

Advanced study in relief, intaglio, lithographic and/or serigraphy printmaking with emphasis on individual creative expression. Prerequisites: ART\_PRNT 3700 and/or consent required. May be repeatable to 15 hours. Expendable materials fee required.

**ART\_PRNT 4785. Problems in Printmaking. 1-3 Credit.**

Prerequisites: departmental consent.

**ART\_PRNT 7700. Graduate Printmaking. 3 Credits.**

Graduate level study in relief, intaglio or lithographic printmaking with emphasis on individual creative expression. Prerequisites: ART\_PRNT 4700 and graduate standing. May repeat to 15 hours maximum. Expendable materials fee required.

**ART\_PRNT 7785. Problems in Printmaking. 1-3 Credit.**

Prerequisites: graduate standing, ART\_PRNT 7700 and departmental consent.

**ART\_PRNT 8700. Graduate Printmaking II. 3 Credits.**

Continuation of Art-Printmaking [ART\_PRNT] 7700 Graduate Printmaking. Prerequisites: Art-Printmaking [ART\_PRNT] 7700 or equivalent and graduate standing. Repeatable to 15 hours.

## Art-Sculpture (ART\_SCUL)

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**ART\_SCUL 2800. Beginning Sculpture. 3 Credits.**

Principles of sculptural organization, figure studies, modeling techniques, simple plaster casting. Payment of expendable materials expense is required. Prerequisites: Art-General [ART\_GNRL] 1030 or 2200.

**ART\_SCUL 2810. Experimental Media I. 3 Credits.**

Ordering and structuring materials into compositional forms, using various media, traditional as well as new. Subject matter will vary each semester. Prerequisites: Art-General [ART\_GNRL] 2200 or instructor's consent.

**ART\_SCUL 3800. Intermediate Sculpture. 3 Credits.**

Continuation of Art-Sculpture 2800. Introduction to carving techniques. Payment of expendable materials expense is required. Prerequisite: Art-Sculpture [ART\_SCUL] 2800.

**ART\_SCUL 3810. Experimental Media II. 3 Credits.**

Continuation of Art-Sculpture 2810. Prerequisite: Art-Sculpture [ART\_SCUL] 2810.

**ART\_SCUL 4800. Advanced Sculpture. 3 Credits.**

This course will build skills acquired in Art-Sculpture 3800, Intermediate Sculpture including welding, casting, carving and assemblage with emphasis on the development of a personal visual language. Prerequisite: Art-Sculpture [ART\_SCUL] 3800, may repeat to 15 hours maximum.

**ART\_SCUL 4810. Experimental Media III. 3 Credits.**

Continuation of Art-Sculpture 3810. Prerequisite: Art-Sculpture [ART\_SCUL] 3810. May repeat to 15 hours maximum.

**ART\_SCUL 4885. Problems in Sculpture. 1-3 Credit.**

Prerequisites: departmental consent.

**ART\_SCUL 7800. Graduate Sculpture. 3 Credits.**

Payment of expendable materials expense is required. Prerequisite: graduate standing. May repeat to 15 hours maximum.

**ART\_SCUL 7810. Experimental Media IV. 3 Credits.**

Advanced study of compositional organization at the graduate level. Prerequisites: Art-Sculpture [ART\_SCUL] 4810 and graduate standing. May repeat to 9 hours maximum.

**ART\_SCUL 7885. Problems in Sculpture. 1-3 Credit.**

Prerequisites: graduate standing, Art-Sculpture [ART\_SCUL] 7800 and departmental consent.

**ART\_SCUL 8800. Graduate Sculpture II. 3 Credits.**

Continuation of Art-Sculpture [ART\_SCUL] 7800 Graduate Sculpture. Prerequisites: Art-Sculpture [ART\_SCUL] 7800 or equivalent. Repeatable to 15 hours.

## **Astronomy (ASTRON)**

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**ASTRON 1010. Introduction to Astronomy. 4 Credits.**

Survey of methods of astronomy; description of the solar system, stellar astronomy, structure of the galaxy and the universe. Three hours of lecture and one hour of lab per week (scheduled by the instructor). Satisfies physical science laboratory requirement. Laboratory section: Survey of astronomical methods, instruments, observations and measurement techniques. Prerequisite: high school algebra and plane geometry, or Math [MATH] 1100/1120, or equivalent.

**ASTRON 1020. Introduction to Laboratory Astronomy. 2 Credits.**

Laboratory supplement to Astronomy 1010. Satisfies physical science laboratory requirement. Survey of astronomical methods, instruments, observations and measurement techniques. Prerequisite: high school algebra and geometry.

**ASTRON 3010. Introduction to Modern Astrophysics. 3 Credits.**

(same as Physics [PHYSICS] 3010). Elements of stellar, and galactic astrophysics. Interpretation of observations and physical conditions of various astronomical objects including stars, gaseous nebulae and, galaxies. Prerequisite: Physics [PHYSICS] 2760.

**ASTRON 3020. Astrophysical Techniques. 3 Credits.**

(same as Physics [PHYSICS] 3020). Elements of modern astronomical instruments, observations and analysis. Prerequisite: Physics [PHYSICS] 3010 or concurrently.

**ASTRON 4180. Solar System Science. 3 Credits.**

(same as Physics [PHYSICS] and Geology [GEOL] 4180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution. Prerequisites: Math [MATH] 1700, Physics [PHYSICS] 1220 or 2760 or instructor's consent.

**ASTRON 4250. Stellar Astrophysics. 3 Credits.**

(same as Physics [PHYSICS] 4250). Basic astrophysics of stable and unusual stars, stellar systems. Investigates stellar dimensions, radiation, spectra, energy, evolution, populations; interstellar medium, stellar motions and aggregation. Prerequisite: Physics [PHYSICS] 3150 or concurrently or instructor's consent.

**ASTRON 4350. Galactic Astronomy. 3 Credits.**

(same as Physics [PHYSICS] 4350). Observational properties of normal galaxies and clusters of galaxies, Seyfert and emission-line structure and dynamics of galaxies; interacting galaxies, quasi-stellar objects. Introduction to cosmology. Prerequisites: Physics [PHYSICS] 3010, 4140 or instructor's consent.

**ASTRON 4360. Extragalactic Astronomy. 3 Credits.**

(same as Physics [PHYSICS] 4360). This course introduces students to the most basic knowledge of extragalactic astronomy, starting from Milky Way and extending to the most distant universe. Topics covered will include galaxy morphology and classification, groups and clusters of galaxies, active galactic nuclei, and galaxy formation and evolution. Prerequisite: Physics [PHYSICS] 2760.

**ASTRON 4460. Interstellar Medium. 3 Credits.**

(same as Physics [PHYSICS] 4460). The course discusses observational properties and physical and chemical processes occurring in the interstellar medium. Topics include interstellar diffuse and molecular clouds, HII regions, dust grains, interstellar chemistry, star formation, supernova remnants, and interstellar shock waves. Prerequisites: Physics [PHYSICS] 1220 or 2760.

**ASTRON 4550. Cosmochemistry. 3 Credits.**

(same as Physics [PHYSICS] 4550/7550). Cosmic dust, stardust, spectra, energy, interstellar medium, meteorites, astromineralogy. Prerequisites: Physics [PHYSICS] 2760 or 1220; instructor's consent.

**ASTRON 4950. Undergraduate Research in Astronomy. 1-99 Credit.**

Special studies in astronomy; covers subjects not included in courses regularly offered. Prerequisite: instructor's consent.

**ASTRON 4960. Senior Thesis in Astronomy. 3 Credits.**

Special studies for senior undergraduate students in astronomy. The course requires an oral or poster presentations, or faculty-guided writing of a senior thesis involving independent research. Prerequisites: instructor's consent and 3 units of Astronomy [ASTRON] 4950. Departmental consent required for repetition.

**ASTRON 7180. Solar System Science. 3 Credits.**

(same as Physics [PHYSICS] and Geology [GEOL] 7180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution. Prerequisites: Physics [PHYSICS] 1220 or 2760 or instructor's consent.

**ASTRON 7550. Cosmochemistry. 3 Credits.**

(same as Physics [PHYSICS] 7550). Chemistry of cosmic dust and molecules. Prerequisites: Physics [PHYSICS] 2760 or 1220; instructor's consent.

**ASTRON 7750. Interstellar Medium. 3 Credits.**

(same as PHYSICS 7750). The course discusses observational properties and physical and chemical processes occurring in the interstellar medium. Topics include interstellar diffuse and molecular clouds, HII regions, dust grains, interstellar chemistry, star formation, supernova remnants, and interstellar shock waves. Prerequisites: PHYSICS 1220 or PHYSICS 2760.

**ASTRON 8301. Topics in Astronomy and Astrophysics. 3 Credits.**

(same as Physics [PHYSICS] 8301). Selected topics from solar system, stellar galactic and extragalactic astronomy and astrophysics. May be repeated to a maximum of 6 hours. Prerequisite: instructor's consent.

**ASTRON 8550. Stellar Structure and Evolution. 3 Credits.**

(same as Physics [PHYSICS] 8550). Reviews of atomic and molecular spectra. Investigates quantum radiation law, emission and absorption processes, radiation transfer theory, continuous and discrete line spectra of stars, stellar composition. Prerequisite: Astronomy [ASTRON] 4250, Physics [PHYSICS] 4800, or instructor's consent.

## **Athletic Training (ATHTRN)**

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**ATHTRN 1100. Athletic Training Skills I. 2 Credits.**

Introduction to the development of psychomotor skills for athletic training. Taping and wrapping skills for the lower extremity; wound care, ice bag/massage; whirlpool and hydrocollator use are covered. Graded on A/F basis only. Prerequisite: Restricted to Pre-Athletic Training Majors only; consent of instructor required.

**ATHTRN 1200. Athletic Training Skills II. 2 Credits.**

Continuation of development of psychomotor skills for athletic training: taping and wrapping of the upper extremities and trunk. Record keeping; basic first aid; and other athletic training administrative tasks are discussed. Graded on A/F basis only. Prerequisite: Pre-Athletic Training Majors; consent of instructor required.

**ATHTRN 2100. Principles and Fundamentals of Athletic Training. 3 Credits.**

Introduces students to common principles associated with the athletic training profession which include important areas essential for the performance of athletic training duties. May be repeated for credit. Graded on A-F basis only. Prerequisite: Restricted to Pre-athletic training majors; instructor's consent.

**ATHTRN 2150. Athletic Training Practicum I. 3 Credits.**

Practical application under the direct supervision of a certified athletic trainer. Athletic training room etiquette; practice and game preparation; understanding, recognizing, evaluating, and treating athletic injuries. Graded on A-F basis only. Prerequisites: restricted to Athletic Training Majors; ATHTRN 1100, ATHTRN 1200, ATHTRN 2100.

**ATHTRN 2250. Athletic Training Practicum II. 3 Credits.**

Practical application under the direct supervision of a certified athletic trainer. Continuation of athletic training room etiquette; practice and game prep; understanding, recognizing, evaluating, and treating athletic injuries. Graded on A-F basis only. Prerequisites: Restricted to Athletic Training majors; ATHTRN 2150.

**ATHTRN 2500. Elementary Human Anatomy. 3 Credits.**

Analysis of the structure and function of cells, tissue, and organ systems. Emphasis is placed on the muscular, skeletal, and nervous systems as they relate to human movement and homeostasis. An Introduction to key

terminology and concepts is also presented. Graded on A/F basis only. Prerequisite: Restricted to Athletic Training Majors only.

**ATHTRN 2600. Human Physiology. 3 Credits.**

Investigation into the structure, function, physiology, and biochemistry of the cardiovascular, lymphatic, respiratory, digestive, urinary, endocrine, and reproductive systems as well as the study of special senses. Graded on A-F basis only. Prerequisites: Restricted to Athletic Training Majors Only.

**ATHTRN 3150. Athletic Training Practicum 3. 3 Credits.**

Two options are available for this clinical rotation. Option 1: Hands-on experience with an equipment intensive sport, such as football. Option 2: Health science and medical rotation. Graded on A/F basis only. Prerequisites: Restricted to Athletic Training Majors only; ATHTRN 2250.

**ATHTRN 3250. Athletic Training Practicum 4. 3 Credits.**

Students further develop and perfect learned athletic training skills under the direct supervision of certified athletic trainer. Graded on A-F basis only. Prerequisite: Restricted to Athletic training majors; ATHTRN 3150.

**ATHTRN 3300. Lower Extremity, Trunk, Spine Assessment. 3 Credits.**

Provides athletic training students with a systematic approach to orthopedic injury evaluation. Each body segment of the lower extremity, trunk and spine are examined including functional anatomy, neurological innervations, associated pathologies and comprehensive evaluation. Graded on A-F basis only. Prerequisites: Restricted to Athletic training majors; ATHTRN 2100, ATHTRN 2500, ATHTRN 2600.

**ATHTRN 3350. Lower extremity, Trunk, Spine Assessment Lab. 2 Credits.**

Provides athletic training students with the practical experience associated with theoretical concepts in the lower extremity, trunk, and spine assessment course. Comprehensive orthopedic evaluations and interpretations are conducted for the lower extremity, trunk and spine. Graded on A-F basis only. Prerequisites: restricted to Athletic training majors; taken concurrently with ATHTRN 3300.

**ATHTRN 3400. Upper Extremity and Head Assessment. 3 Credits.**

Provides athletic training students with a systematic approach to orthopedic injury evaluation. Each body segment of the upper extremity, and head are examined including functional anatomy, neurological innervations, associated pathologies and comprehensive evaluation. Graded on A-F basis only. Prerequisites: restricted to Athletic training majors; ATHTRN 3300, ATHTRN 3350.

**ATHTRN 3450. Upper Extremity and Head Assessment Lab. 2 Credits.**

Provides athletic training students with the practical experience associated with theoretical concepts in the upper extremity and head assessment course. Comprehensive orthopedic evaluations and interpretations are conducted for the upper extremity and head. Graded on A-F basis only. Prerequisites: restricted to Athletic training majors; Taken concurrently with ATHTRN 3400.

**ATHTRN 3500. Rehabilitation of Athletic Injuries. 4 Credits.**

The Theory and Application behind rehabilitative tools utilized in the athletic setting (in-season and out-of-season). Emphasis is placed on developing and administering rehabilitative programs based on injury, the healing process, and return to function/play. Graded on A-F basis only. Prerequisites: restricted to Athletic training majors; ATHTRN 3300, ATHTRN 3350, ATHTRN 3400, ATHTRN 3450.

**ATHTRN 3600. Administration of Athletic Training. 3 Credits.**

Examines the Administrative aspects of the athletic trainer in developing and managing a healthcare facility specializing in the care and treatment of the athletic population. Graded on A-F basis only. Prerequisite: restricted to Athletic training majors.

**ATHTRN 3700. Therapeutic Modalities. 4 Credits.**

Comprehensive study of the various therapeutic modalities utilized in the treatment and rehabilitation of athletic injuries. Understanding the technology, theory and practical applications of appropriate modalities is emphasized. Graded on A-F basis only. Prerequisites: restricted to Athletic training majors; ATHTRN 3500.

**ATHTRN 3800. General Medical Conditions. 3 Credits.**

Students study the general medical conditions, illnesses and disease found within the athletic population. Emphasis is placed on the recognition, treatment, referral options, of these conditions/diseases. Course graded on A-F basis only. Prerequisites: restricted to Athletic Training Majors only, ATHTRN 3150.

**ATHTRN 4150. Athletic Training Practicum 5. 3 Credits.**

Two options are available for this clinical rotation. Option 1: Hands-on experience with an equipment intensive sport, such as football. Option 2: Health science and medical rotation. A minimum of 80 documented hours is required. Graded on A/F basis only. Prerequisite: Restricted to Athletic Training Majors, ATHTRN 3250.

**ATHTRN 4500. Nutrition for Athletic Performance and Rehabilitation. 3 Credits.**

Nutritional study examining how nutrition impacts sports performance. Basic Nutritional biochemical and physiological principles provide the foundation for the understanding of the role of nutrition in performance. Graded on A-F basis only. Prerequisites: restricted to Athletic training majors; HTH\_PR 4420.

**ATHTRN 4970. Seminar in Athletic Training I. 3 Credits.**

A seminar formatted course that requires students to review and critically evaluate current literature in the athletic training profession. Students are instructed in the proper method for written evaluation of scientific literature and peer presentation. Graded on A-F basis only. Prerequisite: Restricted to Athletic Training majors; ATHTRN 3250.

**ATHTRN 4990. Seminar in Athletic Training II. 3 Credits.**

The culminating experience in athletic training which reviews the cognitive, psychomotor and affective domains of athletic training to prepare students to challenge the NATA-BOC examination. Graded on A-F basis only. Prerequisites: Restricted to Athletic Training Majors; ATHTRN 4150.

## **Atmospheric Science (ATM\_SC)**

**ATM\_SC 1050. Introductory Meteorology. 3 Credits.**

(same as Geography [GEOG] 1050). Physical processes of atmosphere in relation to day-to-day changes in weather.

**ATM\_SC 2100. Introduction to Atmospheric Science. 3 Credits.**

Physical process of the atmospheric and climate system will be related to day-to-day weather changes. Students will be introduced to the laws of motion and thermodynamics that govern motions in geophysical fluid. Graded on A/F basis only. Prerequisite: Mathematics [MATH] 1160 or concurrent enrollment in MATH 1500.

**ATM\_SC 2150. Natural Hazards. 3 Credits.**

A survey of natural hazards, including severe thunderstorms, tornadoes, flooding, tropical storms, ocean movements, earthquakes, tsunamis, volcanoes, asteroids, solar weather, managing risk and human impacts. Prerequisites: Atmospheric Science [ATM\_SC] 1050 or equivalent or instructor's consent. Graded on A-F basis only.

**ATM\_SC 2720. Weather Briefing. 1 Credit.**

Student participation in daily discussions of current weather patterns and forecasts and their applications to weather sensitive activities including aviation, agriculture and industry. Prerequisites: Atmospheric Science [ATM\_SC] 1050.

**ATM\_SC 2792. Weather Communication. 1 Credit.**

Methods of surface and upper air weather observation. How such data are distributed to users in the meteorological community is also addressed. Prerequisite: Atmospheric Science [ATM\_SC] 1050; sophomore standing or instructor's consent.

**ATM\_SC 3000. Independent Study in Atmospheric Science. 1-3 Credit.**

Independent study of a topic dealing with meteorological theory or application of meteorological science to the solution of relevant problem. Prerequisites: upper-level standing, Atmospheric Science [ATM\_SC] 1050 or equivalent, and instructor's consent.

**ATM\_SC 3600. Climates of the World. 3 Credits.**

(same as Geography [GEOG] 3600). A study of the world distribution of climates based on "cause and effect" relationships. Special attention is given to the impacts of climate on humanity. Prerequisites: Atmospheric Science [ATM\_SC] 1050 or equivalent or graduate standing.

**ATM\_SC 4001. Topics in Atmospheric Science. 1-99 Credit.**

Development of theory and applications for selected topics in atmospheric science. Prerequisites: junior standing and instructor's consent.

**ATM\_SC 4110. Broadcast Meteorology I. 2 Credits.**

An introduction to broadcast meteorology including the business of media, use of meteorological data to produce a forecast, and television and radio presentation skills. Prerequisites: Atmospheric Science [ATM\_SC] 1110, 2720, or equivalents, and Co-requisite: ATM\_SC 4710. Restricted to Atmospheric Science majors or instructor's consent. Graded on A/F basis only.

**ATM\_SC 4310. Atmospheric Thermodynamics. 4 Credits.**

Thermodynamics of dry and moist air, atmospheric hydrostatics, convection, and development of the fundamental equations of geophysical fluid dynamics. Prerequisites: Atmospheric Science [ATM\_SC] 1050, Mathematics [MATH] 1700 (C or better), and one physics course.

**ATM\_SC 4320. Atmospheric Dynamics. 4 Credits.**

Dynamics and kinematics of atmospheric flow. Manipulation of fundamental equations, numerical modeling of atmosphere. Prerequisite: Atmospheric Science [ATM\_SC] 4310/7310.

**ATM\_SC 4350. Mesoscale Meteorology and Dynamics. 3 Credits.**

Survey of mesoscale phenomena, observing systems, analysis techniques, and modeling. Topics include fronts, jet streaks, gravity waves, organized convection, tornadoes, and severe local storm forecasting and structure. Prerequisite: Atmospheric Science [ATM\_SC] 4720/7720 and Mathematics [MATH] 2300.

**ATM\_SC 4400. Micrometeorology. 3 Credits.**

Study of transport processes in the surface boundary layer. Important applications in pollution will be discussed. Prerequisite: Atmospheric Science [ATM\_SC] 4310 or Physics [PHYSICS] 2760, Mathematics [MATH] 2300.

**ATM\_SC 4500. Advanced Meteorological Observation and Instrumentation. 3 Credits.**

Automated weather observation and instrumentation used in networks of remote automated weather stations. Emphasis on electronic instrumentation, datalogger programming, data collection and data management, generating dynamic reports on the World Wide Web. Prerequisite: Atmospheric Science [ATM\_SC] 1050. May be repeated for credit.

**ATM\_SC 4510. Remote Sensing for Meteorology and Natural Resources. 3 Credits.**

Principles of remote sensing with emphasis on the properties of atmosphere and the earth's surface from airborne and satellite sensors. The techniques for using geosynchronous and orbiting satellite platforms for assessing weather and natural resource features. Prerequisites: Atmospheric Science [ATM\_SC] 1110, Mathematics [MATH] 1500, junior standing or instructor's consent.

**ATM\_SC 4520. Environmental Biophysics. 3 Credits.**

(same as Geography [GEOG] 4520). Students will learn techniques and principles used to describe the microenvironment of living organisms and use quantitative expressions to estimate missing values, and mass transfer laws to estimate flux of energy, water and gas. Prerequisites: College Physics and Calculus I.

**ATM\_SC 4550. Atmospheric Physics. 3 Credits.**

Physics of atmospheric nucleation-condensation, cloud droplet and precipitation formation, associated electrical phenomena, radiation transfer and remote sensing. Prerequisites: 1 year of college Physics and Mathematics [MATH] 1700.

**ATM\_SC 4590. Radar Meteorology. 3 Credits.**

Course concerns the theory and application of radar in meteorology. Prerequisites: Atmospheric Science [ATM\_SC] 1110, Mathematics [MATH] 1700, Physics [PHYSICS] 2750. May be repeated for credit.

**ATM\_SC 4650. Long-Range Forecasting. 3 Credits.**

Physical-dynamical principles of long-range forecasting from a month to a year. Empirical and numerical approaches in forecast practice. Prerequisite: Atmospheric Science [ATM\_SC] 4050/7050 or 3600.

**ATM\_SC 4710. Synoptic Meteorology I. 4 Credits.**

Meteorological Data. Basic techniques for surface and upper air analysis, using selected examples of weather patterns. Prerequisites: Atmospheric Science [ATM\_SC] 1050, Mathematics [MATH] 1700 (C or better), one physics course (pre or corequisite).

**ATM\_SC 4720. Synoptic Meteorology II. 4 Credits.**

Graphical analysis and interpretation of physical, kinematical and dynamical properties of the atmosphere. Analysis techniques applicable to atmospheric research. Prerequisite: Atmospheric Science [ATM\_SC] 4710/7710.

**ATM\_SC 4730. Advanced Forecasting Laboratory. 3 Credits.**

Advanced principles of weather forecasting will be addressed via online electronic modules and weekly laboratory exercises. Prerequisites: Atmospheric Science [ATM\_SC] 4710/7710, 4720/7720, Mathematics [MATH] 2300. Graded on A/F basis only.

**ATM\_SC 4800. Numerical Methods in Atmospheric Science and Natural Resources. 3 Credits.**

Examines numerical methods used in solving differential equations, filtering data sets, and Fourier decomposition of discrete data sets. Prerequisite: Math through Calculus III or senior standing.

**ATM\_SC 4949. Internship in Meteorology. 1-6 Credit.**

Practical professional work experience with professional or scientific meteorologists in off-campus work environment. Graded on S/U basis only. Prerequisites: junior standing, 12 hours Atmospheric Science.

**ATM\_SC 4950. Undergraduate Research in Atmospheric Science. 1-4 Credit.**

Research apprenticeship with a faculty mentor. Students are expected to develop initial concept for the research, design experiments, collect data, and analyze data with faculty input, oversight, and guidance. Prerequisites: Statistics [STAT] 1400, Mathematics [MATH] 1500, 10 hours of Atmospheric Science and instructor's consent.

**ATM\_SC 4990. Daily Analysis and Forecast Interpretation. 3 Credits.**

A Capstone experience. In depth daily analysis and interpretation by students of the current and forecast states of the atmosphere. Discussions of implications to specific weather sensitive activities. Prerequisite: senior or graduate Atmospheric Science major.

**ATM\_SC 7001. Topics in Atmospheric Science. 1-99 Credit.**

Development of theory and applications for selected topics in atmospheric science. Prerequisites: graduate standing and instructor's consent.

**ATM\_SC 7085. Problems in Atmospheric Science. 1-99 Credit.**

Independent study by graduate students in atmospheric science. Prerequisites: graduate standing.

**ATM\_SC 7310. Atmospheric Thermodynamics. 4 Credits.**

Thermodynamics of dry and moist air, atmospheric hydrostatics, convection, and development of the fundamental equations of geophysical fluid dynamics. Prerequisites: graduate standing and Atmospheric Science [ATM\_SC] 1050, Mathematics [MATH] 1700 (C or better), and one physics course.

**ATM\_SC 7320. Atmospheric Dynamics. 4 Credits.**

Dynamics and kinematics of atmospheric flow. Manipulation of fundamental equations, numerical modeling of atmosphere. Prerequisite: graduate standing and Atmospheric Science [ATM\_SC] 4310/7310.

**ATM\_SC 7350. Mesoscale Meteorology and Dynamics. 3 Credits.**

Survey of mesoscale phenomena, observing systems, analysis techniques, and modeling. Topics include fronts, jet streaks, gravity waves, organized convection, tornadoes, and severe local storm forecasting and structure. Prerequisite: graduate standing and Atmospheric Science [ATM\_SC] 4720/7720 and Mathematics [MATH] 2300.

**ATM\_SC 7400. Micrometeorology. 3 Credits.**

Study of transport processes in the surface boundary layer. Important applications in pollution will be discussed. Prerequisite: graduate standing and Atmospheric Science [ATM\_SC] 4050/7050.

**ATM\_SC 7510. Remote Sensing for Meteorology and Natural Resources. 3 Credits.**

Principles of remote sensing with emphasis on the properties of atmosphere and the earth's surface from airborne and satellite sensors. The techniques for using geosynchronous and orbiting satellite platforms for assessing weather and natural resource features. Graduate student credit is dependent upon completion of additional advanced research

assignments. Prerequisites: Graduate standing or instructor's consent. Graded A-F only.

**ATM\_SC 7520. Environmental Biophysics. 3 Credits.**

(same as Geography [GEOG] 7520). Students will learn techniques and principles used to describe the microenvironment of living organisms and use quantitative expressions to estimate missing values, and mass transfer laws to estimate flux of energy, water, and gas. Prerequisites: college physics, calculus I.

**ATM\_SC 7550. Atmospheric Physics. 3 Credits.**

Physics of atmospheric nucleation-condensation, cloud droplet and precipitation formation, associated electrical phenomena, radiation transfer and remote sensing. Prerequisites: graduate standing and 1 year of college Physics and Mathematics [MATH] 1700.

**ATM\_SC 7590. Radar Meteorology. 3 Credits.**

Course concerns the theory and application of radar in meteorology. Graduate students will be required to conduct an independent research project using radar, in addition to the undergraduate requirements for the class. Prerequisites: Mathematics [MATH] 1700, Physics [PHYSICS] 2760; graduate standing. May be repeated for credit.

**ATM\_SC 7650. Long-Range Forecasting. 3 Credits.**

Physical-dynamical principles of long-range forecasting from a month to a year. Empirical and numerical approaches in forecast practice. Prerequisite: graduate standing Atmospheric Science [ATM\_SC] 4050/7050 or 3600.

**ATM\_SC 7710. Synoptic Meteorology I. 4 Credits.**

Meteorological Data. Basic techniques for surface and upper air analysis, using selected examples of weather patterns. Prerequisites: graduate standing and Atmospheric Science [ATM\_SC] 1050, Mathematics [MATH] 1700 (C or better), one physics course (pre or corequisite).

**ATM\_SC 7720. Synoptic Meteorology II. 4 Credits.**

Graphical analysis and interpretation of physical, kinematical and dynamical properties of the atmosphere. Analysis techniques applicable to atmospheric research. Prerequisite: graduate standing and Atmospheric Science [ATM\_SC] 4710/7710.

**ATM\_SC 7800. Numerical Methods in Atmospheric Science and Natural Resources. 3 Credits.**

Examines numerical methods used in solving differential equations, filtering data sets, and Fourier decomposition of discrete data sets. Prerequisite: graduate standing and Math through Calculus III.

**ATM\_SC 8001. Topics in Atmospheric Science. 3 Credits.**

Development of the theory with its application for selected topics in atmospheric science. Prerequisites: graduate standing.

**ATM\_SC 8090. Masters Research in Atmospheric Science. 1-99 Credit.**

Original investigation in atmospheric science in support of a master's thesis. Graded on S/U basis only.

**ATM\_SC 8400. Atmospheric General Circulation. 3 Credits.**

Comprehensive review of dynamical theories of general circulation with intensive discussion of current problems. Prerequisites: Atmospheric Science [ATM\_SC] 4320/7320.

**ATM\_SC 8450. Tropical Meteorology. 3 Credits.**

Study of the synoptic and dynamic character of the atmosphere in the tropical regions, including an examination of the general circulation and tropical storms. Prerequisite: Atmospheric Science [ATM\_SC] 4710/7710,

4720/7720 and Mathematics [MATH] 2300; graduate standing and instructor's consent. Graded on A/F basis only.

**ATM\_SC 8500. Radiation in the Atmosphere. 3 Credits.**

Physics of solar and infrared radiative transfer in the atmosphere, including energy conversion effects, atmospheric optics, and photochemical processes. Prerequisites: one year College Physics and Mathematics [MATH] 1700.

**ATM\_SC 8550. Nowcasting. 3 Credits.**

Students will learn the science of nowcasting through the study of the various methods used and apply their knowledge in the design of the elements of a nowcast system and practical nowcasting exercises. Prerequisites: Atmospheric Science [ATM\_SC] 8500, graduate standing and instructor's consent.

**ATM\_SC 8600. Advanced Climate Dynamics. 3 Credits.**

Study of global climate; application of large scale atmospheric dynamics; conservation of various forms of energy, climatic evaluation, large scale climatic modification. Prerequisites: Atmospheric Science [ATM\_SC] 4320/7320 and 8400 or 3600.

**ATM\_SC 9001. Topics in Atmospheric Science. 1-99 Credit.**

Development of the theory with its application for selected topics in atmospheric science. Prerequisites: graduate standing.

**ATM\_SC 9085. Problems in Atmospheric Science. 1-99 Credit.**

Independent study by graduate students in atmospheric science. Prerequisites: graduate standing.

**ATM\_SC 9087. Seminar in Atmospheric Science. 1-99 Credit.**

Prerequisite: graduate standing.

**ATM\_SC 9090. Doctoral Research in Atmospheric Science. 1-99 Credit.**

Original investigation in atmospheric science in support of a doctoral dissertation. Graded on S/U basis only.

**ATM\_SC 9300. Introduction to Chaos Theory. 3 Credits.**

Atmospheric predictability and related topics are examined as they relate to governing equations of motion and their non-linear solutions. Prerequisite: Atmospheric Science [ATM\_SC] 4320/7320, Mathematics [MATH] 4100.

**ATM\_SC 9350. Advanced Dynamic Meteorology. 3 Credits.**

Application of perturbation dynamics, advanced dynamics, and numerical methods to study of atmospheric circulations. Prerequisite: Atmospheric Science [ATM\_SC] 4320/7320.

**ATM\_SC 9700. Advanced Synoptic Meteorology. 3 Credits.**

Detailed examination of vertical motions, their forcing, and how each is diagnosed (quasigeostrophic theory, the Trenberth approximation, Q-vectors). Current issues in synoptic meteorology and operational forecasting are discussed. Prerequisite: Atmospheric Science [ATM\_SC] 4720/7720.

**ATM\_SC 9712. Convection and Lightning. 3 Credits.**

Cumulus convection and cloud physics topics that will facilitate a deeper understanding of cloud electrification and lightning production are studied. Prerequisite: Atmospheric Science [ATM\_SC] 4710/7710, 4720/7720, Mathematics [MATH] 2300; instructor's consent. Graded on A/F basis only.

**ATM\_SC 9800. Numerical Weather Prediction. 3 Credits.**

Examination of finite difference and objective analysis techniques, basic physical concepts, and parameterization of physical processes.



Experience with a range of models (1-D cloud to operational PE models) stressed. Prerequisite: instructor's consent.

## Biochemistry (BIOCHM)

### **BIOCHM 1090. Introduction to Biochemistry. 3 Credits.**

Fundamental concepts in biochemistry and molecular biology: structure function relationships, reactivity, thermodynamics, gene expression. Professional skills for biomedical careers. Primarily for freshman and sophomore biochemistry majors. Prerequisite: departmental consent.

### **BIOCHM 1094. Introductory Biochemistry Laboratory. 2 Credits.**

Techniques course involving analytical experiments with carbohydrates, lipids, proteins, nucleic acids; use of instrumentation in biochemistry; purification and kinetics of enzymes, PCR and cloning. Corequisite: concurrent enrollment in BIOCHM 1090 required. Graded on A/F basis only. Departmental Consent Required.

### **BIOCHM 2002. Topics in Biochemistry - Biological/Physical/Mathematics. 1-4 Credit.**

Initial offering of a course in Biochemistry designed primarily for undergraduates.

### **BIOCHM 2110. The Living World: Molecular Scale. 3 Credits.**

Survey of modern biochemistry and biotechnology. Structure and function of DNA, proteins, lipids and carbohydrates. The role of biopolymers in life processes and everyday living is emphasized.

### **BIOCHM 2112. Biotechnology in Society. 3 Credits.**

Biotechnology in a social context covers three areas: introduction to terminology and concepts, specific biotechnological applications to modern problems, and ethical questions.

### **BIOCHM 2480. Introduction to Macromolecular Structure and Function. 2 Credits.**

The function of biochemical macromolecules is directly related to their structure. The three-dimensional structures of proteins, nucleic acids, polysaccharides and membranes are each explored in the context of their functions and their microenvironments within living organisms. Pre or corequisites: Organic Chemistry I or concurrent enrollment. Graded on A/F basis only.

### **BIOCHM 2484. Macromolecular Techniques Laboratory. 2 Credits.**

The laboratory experiments include DNA isolation, DNA cloning, PCR, plasmid transformation, protein expression, affinity-tagged chromatography, SDS-polyacrylamide gel electrophoresis, enzyme isolation, enzyme assay, buffer preparation, and Michaelis-Menten kinetics. Corequisites: concurrent enrollment in BIOCHM 2480; Biochemistry majors only. Graded on A/F basis only.

### **BIOCHM 2484H. Macromolecular Techniques Laboratory - Honors. 2 Credits.**

The laboratory experiments include DNA isolation, DNA cloning, PCR, plasmid transformation, protein expression, affinity-tagged chromatography, SDS-polyacrylamide gel electrophoresis, enzyme isolation, enzyme assay, buffer preparation, and Michaelis-Menten kinetics. Graded on A/F basis only. Corequisites: concurrent enrollment in BIOCHM 2480; Biochemistry majors only. Honors eligibility required.

### **BIOCHM 3630. General Biochemistry. 3 Credits.**

Survey of biochemistry; static/dynamic aspects of carbohydrates, lipids, proteins, nucleic acid. Discussion of metabolic pathways, energy

production, and metabolic regulatory mechanism. Prerequisites: CHEM 2050.

### **BIOCHM 4001. Topics in Biochemistry. 1-99 Credit.**

Experimental courses; highly specialized topics taught infrequently or courses taught by visiting professors.

### **BIOCHM 4270. Biochemistry. 3 Credits.**

First semester of comprehensive biochemistry course: metabolic pathways, amino acids/proteins, carbohydrates, lipids, nucleic acids, kinetics, energy requirements, metabolic regulation in living cells. Prerequisite: CHEM 2110.

### **BIOCHM 4272. Biochemistry. 3 Credits.**

Second semester of a comprehensive biochemistry course, including metabolism of carbohydrates, fatty acids, steroids, amino acid synthesis and metabolism, molecular genetics, hormones, photosynthesis and integrated metabolism. Prerequisite: BIOCHM 4270.

### **BIOCHM 4300. Physical Chemistry of Biological Systems. 3 Credits.**

To present fundamental principles of physical chemistry in the context of the structure and function of biological macromolecules. Prerequisite: Biochemistry BIOCHM 4270 or concurrent enrollment. Graded on A/F basis only.

### **BIOCHM 4374. Molecular Biology Laboratory. 3 Credits.**

(same as BIO\_SC 4974). Emphasizes recently developed genetic and biochemical techniques; illustrates how they apply to contemporary problems in biological research. Prerequisites: BIO\_SC 2200, BIOCHM 4272 or concurrent registration in BIO\_SC 4976.

### **BIOCHM 4376. Computer Assisted Sequence Analysis and Molecular Modeling. 3 Credits.**

Employs the use of computer-based interactive molecular graphics and sequence analysis software to analyze the three dimensional structures of macromolecules. Prerequisite: CHEM 2110.

### **BIOCHM 4385. Problems in Biochemistry. 1-3 Credit.**

Problems in Biochemistry.

### **BIOCHM 4460. Cancer Biology. 3 Credits.**

(same as BIO\_SC 4460). Cancer, cell biology, genetics, biochemistry. Prerequisites: BIOCHM 4272, BIO\_SC 2300 and BIO\_SC 2200.

### **BIOCHM 4950. Undergraduate Research in Biochemistry. 2-3 Credit.**

Individually directed laboratory research for upperclass students under faculty supervision.

### **BIOCHM 4970. Senior Seminar in Biochemistry. 1 Credit.**

Discuss journal papers dealing with current topics of research, techniques, status of field, importance of results. Students report on completed undergraduate research projects.

### **BIOCHM 4974. Biochemistry Laboratory. 5 Credits.**

Techniques course involving analytical experiments with carbohydrates, lipids, proteins, nucleic acids; use of instrumentation in biochemistry; purification and kinetics of enzymes. Prerequisite: BIOCHM 4270.

### **BIOCHM 4996H. Honors Research in Biochemistry. 2-3 Credit.**

Laboratory research for upper level honors students in consultation with Biochemistry faculty. Honors eligibility required.

### **BIOCHM 7085. Problems in Biochemistry. 1-6 Credit.**

Problems in Biochemistry.

### **BIOCHM 7110. Maps in Medicine Summer Institute. 2 Credits.**

Lab/lecture course in which high school teachers gain knowledge of two innovative, inquiry-based programs, Mapping Health and Mapping Cell

Fate, that focus on influenza and developmental biology and Missouri science standards for biology and health. Graduate standing required. Consent of department required. Graded on S/U basis only.

**BIOCHM 7270. Biochemistry. 3 Credits.**

First semester of comprehensive biochemistry course: metabolic pathways, amino acids/proteins, carbohydrates, lipids, nucleic acids, kinetics, energy requirements, metabolic regulation in living cells.

Prerequisite: CHEM 2120.

**BIOCHM 7272. Biochemistry. 3 Credits.**

Second semester of a comprehensive biochemistry course, including metabolism of carbohydrates, fatty acids, steroids, amino acid synthesis and metabolism, molecular genetics, hormones, photosynthesis and integrated metabolism. Prerequisite: BIOCHM 7270.

**BIOCHM 7274. Biochemistry Laboratory. 5 Credits.**

Techniques course involving analytical experiments with carbohydrates, lipids, proteins, nucleic acids; use of instrumentation in biochemistry; radioisotope tracers in metabolism; isolation, purification and kinetics of enzymes. Prerequisites: graduate standing and concurrent enrollment in Biochemistry [BIOCHM] 7270.

**BIOCHM 7374. Molecular Biology Laboratory. 3 Credits.**

(same as BIO\_SC 7374). Emphasizes recently developed genetic and biochemical techniques; illustrates how they apply to contemporary problems in biological research. Prerequisites: graduate standing and BIO\_SC 2200, BIOCHM 4272 or concurrent registration in BIO\_SC 4976.

**BIOCHM 7376. Computer Assisted Sequence Analysis and Molecular Modeling. 2 Credits.**

This course uses advanced computer graphics and computational techniques to analyze protein and nucleic acid sequences and their three-dimensional structures. Prerequisites: graduate standing and CHEM 2120.

**BIOCHM 7978. Cancer Biology. 3 Credits.**

(same as BIO\_SC 7978). The course will cover major molecular and cellular aspects of cancer. Students will read original research articles, present overviews and lead class discussions. Prerequisites: BIOCHM 4270, BIO\_SC 2300 and BIO\_SC 4976.

**BIOCHM 8060. Ethical Conduct of Research. 1 Credit.**

(same as BIO\_SC 8060). Discussion of ethical issues in biological research, including the rules and conventions for appropriate research conduct. Graded on S/U basis only.

**BIOCHM 8090. Research in Biochemistry. 1-99 Credit.**

Research in biochemistry for qualified students, with counsel of faculty. Includes preparation of dissertation. Graded on a S/U basis only.

**BIOCHM 8240. Introduction to Graduate Biochemistry I. 4 Credits.**

Introduction to biochemistry for life science graduate students. Core course for Biochemistry students. Structures and interactions of biological macromolecules including thermodynamics, binding, enzyme action and biological membranes as well as techniques of analysis and structure determination. Graduate standing required. Prerequisites: Undergraduate organic chemistry plus undergraduate biochemistry or molecular biology, their equivalent or permission of instructor.

**BIOCHM 8260. Macromolecular Systems Integration. 4 Credits.**

To introduce graduate students to biochemistry at the graduate level with particular emphasis on genomics/gene expression and replication; proteomics/cell signaling and metabolism. Prerequisite: BIOCHM 8240 and graduate standing. Course graded on A/F basis only.

**BIOCHM 8360. Nutritional Biochemistry of Carbohydrates. 3 Credits.**

(same as NUTRIT 8360 and NUTR\_S 8360). Current concepts with in-depth coverage of selected examples of key regulatory steps controlling carbohydrate metabolism; emphasizing molecular mechanisms. Based entirely on research literature and taught in a tutorial format. Prerequisites: BIOCHM 7272.

**BIOCHM 8362. Introduction to Plant Metabolism. 2 Credits.**

(same as PLNT\_S 8362 and BIO\_SC 8362). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant metabolism. Graded on A/F basis only.

**BIOCHM 8365. Introduction to Molecular Cell Biology. 2 Credits.**

(same as BIO\_SC 8365 and PLNT\_S 8365). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis on plant biology. This course examines the basic concepts and techniques used to understand molecular cell biology. Graded on A/F basis only.

**BIOCHM 8390. Molecular Biology of Mineral Nutrition. 3 Credits.**

(same as NUTRIT 8390 and NUTR\_S 8390). Current concepts of metal ion transport, intracellular metal trafficking and metal-dependent regulation of gene expression. Based entirely on research literature and taught in a tutorial format. Prerequisites: BIOCHM 7272 and a 4000-level nutrition course.

**BIOCHM 8430. Physical Biochemistry. 3 Credits.**

Physical concepts underlying a variety of physical chemical methods as they apply to biochemical research. Prerequisites: BIOCHM 7272 and CHEM 3300.

**BIOCHM 8432. Enzymology and Metabolic Regulation. 3 Credits.**

A basic introduction to the study of enzymes and their role in intermediary metabolism. Topics include enzyme kinetics, mechanisms of enzymatic catalysis and control of metabolic pathways. Prerequisite: Biochemistry [BIOCHM] 7272.

**BIOCHM 8438. Nutrient Regulation of Gene Expression. 3 Credits.**

(same as Animal Science [AN\_SCI] 8438, Nutrition [NUTRIT] 8438, and Nutritional Sciences [NUTR\_S] 8438). Current concepts with in-depth coverage of several minerals that illustrate themes in molecular mineral nutrition. Based entirely on research literature and taught in a tutorial format. Prerequisites: Biochemistry [BIOCHM] 7272 and a 4000-level nutrition course.

**BIOCHM 8450. Rotation Research. 1-2 Credit.**

Introductory laboratory research. Graded on A/F basis only. Normally 1 hour per advisor per semester, two-1 hour sections can be taken per semester.

**BIOCHM 9001. Topics in Biochemistry. 1-9 Credit.**

Experimental courses, highly specialized topics taught infrequently or courses taught by visiting professors.

**BIOCHM 9085. Problems in Biochemistry. 1-6 Credit.**

Problems in Biochemistry.

**BIOCHM 9087. Seminar in Biochemistry. 1 Credit.**

Review of current literature; individual presentation of research or classical science topics.

**BIOCHM 9090. Research in Biochemistry. 1-99 Credit.**

Research in biochemistry for qualified students, with counsel of faculty. Includes preparation of dissertation. Graded on a S/U basis only.

**BIOCHM 9430. Molecular Biology I. 4 Credits.**

(same as Microbiology [MICROB] 9430). Detailed examination of current fundamental concepts of molecular genetics of bacteria, bacteriophages and yeast. Experimental approaches to analysis of the physical structures of genomic nucleic acids, the biochemistry and genetics of mutations, replication, gene transfer and gene expression will be examined in depth from reports in the current literature.

**BIOCHM 9432. Molecular Biology II. 4 Credits.**

(same as MICROB and BIO\_SC 9432) Detailed experimental analysis of eukaryotic cellular and molecular biology relevant to cellular and viral gene expression, post-transcriptional and post-translational modifications and genome replication. Models for developmental genetic analysis and genetic determinants controlling developmental processes utilizing the current literature will be examined.

**BIOCHM 9462. Hormone Action. 2 Credits.**

A lecture course with weekly assigned readings. Topics will include: a description of selected polypeptide, steroid and other hormones and their biological effects; receptors; second messengers; protein phosphorylation in hormone mediation; growth factors; cellular oncogenes. Prerequisites: BIOCHM 7272.

**BIOCHM 9466. Plant Biochemistry. 3 Credits.**

Emphasizes biochemistry unique to plants; biochemical events plants share with other organisms discussed, compared. Photosynthesis, metabolism, composition, compartmentation, regulation of biochemical events included. Prerequisites: BIOCHM 4270.

**BIOCHM 9468. Molecular Biology of Plant Growth and Development. 3 Credits.**

(same as BIO\_SC 9468). Molecular biology of plant hormones, signal transduction, environmental signals.

**BIOCHM 9470. Analytical Biochemistry--Chromatography. 2 Credits.**

Principles, experimental design, capabilities, limitations, and applications of the general field of chromatography of biologically important molecules. Eight (2-hour) lectures, eight (4-hour) labs. Four weeks.

**BIOCHM 9472. Analytical Biochemistry--Mass Spectrometry. 2 Credits.**

Instrumentation, fragmentation mechanisms, interpretation of spectra, combined gas chromatography--mass spectrometry. Eight (2-hour) lectures, eight (4-hour) labs.

## **Biological Engineering (BIOL\_EN)**

**BIOL\_EN 1000. Introduction to Biological Engineering. 1-2 Credit.**

For first semester engineering students. Develop appreciation for professional engineering. Students will participate with senior design students to conceptualize a case-study problem.

**BIOL\_EN 2000. Professional Development in Engineering. 1-2 Credit.**

A review of professional opportunities, registration, ethics, and societies. Prerequisite: sophomore standing.

**BIOL\_EN 2080. Introduction to Programming for Engineers. 3 Credits.**

This course teaches how to write scientific programs for analysis of data and simulation of physical phenomena using Matlab. Prerequisites: Mathematics [MATH] 1500. Graded on A/F basis only.

**BIOL\_EN 2180. Engineering Analysis of Bioprocesses. 3 Credits.**

Material and Energy Balances. Integrating principles of physics, chemistry and mathematics to analyze steady state and transient biological/biomedical processes. Prerequisites: Mathematics [MATH] 1700, Chemistry [CHEM] 1320, Physics [PHYSICS] 2750. Graded on A/F basis only.

**BIOL\_EN 3001. Topics in Biological Engineering. 3 Credits.**

Current and new technical developments in biological engineering. Prerequisite: instructor's consent.

**BIOL\_EN 3050. Environmental Control for Biological Systems. 3 Credits.**

Systems for controlling the physical environments (heat, moisture, light, contaminating organism, chemicals) for plant and animal systems including livestock, aquacultures, crops and agricultural products. Prerequisites: Engineering [ENGINR] 2300 and Mathematics [MATH] 4100.

**BIOL\_EN 3070. Biological Fluid Mechanics. 3 Credits.**

Basic principles of fluid mechanics applied to transport processes in biological systems. Prerequisites: Physics [PHYSICS] 2750 and Mathematics [MATH] 1700. Graded on A/F basis only.

**BIOL\_EN 3075. Introduction to Materials Engineering. 3 Credits.**

Course covers concepts and techniques in materials engineering from an engineering design perspective, materials requirements for design, and fundamentals; intended for undergraduate engineering students. Prerequisite: Mathematics [MATH] 2300, Engineering [ENGINR] 1200, 2200; Co-requisite: One of the following Biological Engineering [BIOL\_EN] 3180, Chemical Engineering [CH\_ENG] 3261, Mechanical and Aerospace Engineering [MAE] 4231, 4300, or instructor consent. Graded on A/F basis only.

**BIOL\_EN 3170. Biomaterials. 3 Credits.**

Engineering sciences and design will be leverage for the study and design of biomaterials. Understanding the structure-property relationship between biomaterials and tissue will be addressed for implant design. Corequisite: Biological Engineering [BIOL\_EN] 2180, Engineering [ENGINR] 2200 or instructor's consent.

**BIOL\_EN 3180. Heat and Mass Transfer in Biological Systems. 3 Credits.**

Principles of heat and mass transfer and their application to biomedical, bioenvironmental, and bioprocessing areas. Prerequisites: Engineering [ENGINR] 2300 or Chemical Engineering [CH\_ENG] 3261, or concurrently.

**BIOL\_EN 4001. Topics in Biological Engineering. 3 Credits.**

Current and new technical developments in biological engineering. Prerequisite: instructor's consent.

**BIOL\_EN 4070. Bioelectricity. 3 Credits.**

Application of engineering approaches to understand bioelectricity at the cellular level including the equivalent circuit of cell membranes and the electronic design of patch-clamp amplifiers. Prerequisites: Physics [PHYSICS] 2760 and Biological Engineering [BIOL\_EN] 3180 or instructor's consent.

**BIOL\_EN 4080. Engineering Computation. 3 Credits.**

An introduction to numerical methods relevant to biological engineering in the context of scientific computing. Prerequisite: Mathematics [MATH] 4100. Graded on A/F basis only.

**BIOL\_EN 4085. Problems in Biological Engineering. 1-5 Credit.**

Supervised independent study at the undergraduate level. Prerequisite: instructor's consent.

**BIOL\_EN 4150. Soil and Water Conservation Engineering. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4710). Urban and rural run-off and erosion analysis. Design and layout of erosion control structures. Prerequisites: Biological Engineering [BIOL\_EN] 2180 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**BIOL\_EN 4160. Food Process Engineering. 3 Credits.**

Study of transport phenomena and unit operations in food processing systems. Emphasis on fluid flow and heat transfer in food processing, preservation processes, refrigeration, freezing, psychrometrics, and dehydration. Prerequisite: Biological Engineering [BIOL\_EN] 3180 or instructor's consent.

**BIOL\_EN 4170. Biomaterials Interfaces of Implantable Devices. 3 Credits.**

Surface structures and properties to improve biocompatibility will be studied. Engineering sciences and design will be leverage in the design of an improved biocompatible surface. Prerequisites: Biological Engineering [BIOL\_EN] 3170 or instructor's consent.

**BIOL\_EN 4231. Transport Phenomena in Materials Processing. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 4231). Applications of fluid flow, heat transfer, and mass transfer in steady-state and unsteady-state materials processing with applications to metals, polymers, and ceramics. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200, 3400, 4300 (or equivalent courses); and Mathematics [MATH] 4100. Graded on A/F basis only.

**BIOL\_EN 4250. Irrigation and Drainage Engineering. 3 Credits.**

Soil, water, plant relationships. Water supplies and design of surface, sprinkler and drip irrigation systems. Surface and tile drainage. Prerequisites: Civil Engineering [CV\_ENG] 3700 or Mechanical and Aerospace Engineering [MAE] 3400 or Biological Engineering [BIOL\_EN] 2180.

**BIOL\_EN 4260. Food Process Engineering II. 3 Credits.**

Continuing study of transport phenomena and unit operations in food processing systems. Emphasis on fluid food evaporation concentration food dehydration, contact equilibrium processes and mechanical separation processes. Prerequisite: Biological Engineering [BIOL\_EN] 4160 or instructor's consent.

**BIOL\_EN 4270. Design of Experiments and Statistical Quality Control for Process Engineers. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 4270). A practical statistical tool box for experimenters including comparison of process means, effects of variables, design and interpretation of factorial experiments, and statistical quality control. Prerequisite: experience with Excel or instructor's consent.

**BIOL\_EN 4280. Survey of Bioengineering Techniques. 3 Credits.**

Laboratory techniques to train students in Bioelectricity, Biomechanics, Bioenvironment, Biomaterials, Biophotonics, Bioprocessing. Prerequisites: senior standing. Graded on A/F basis only.

**BIOL\_EN 4310. Feedback Control Systems. 4 Credits.**

(same as Electrical and Computer Engineering [ECE] 4310). System modeling and time and frequency response, closed loop control, stability, continuous system design, introduction to discrete time control, software and hardware experiments on compensator design and PID control. Prerequisites: Mathematics [MATH] 4100 and junior/senior standing. Graded on A/F basis only. May be repeated for credit.

**BIOL\_EN 4315. Introduction to Bioprocess Engineering. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 4315). This general introduction to bioprocess engineering covers the fundamentals of microbiology and biochemistry in the context of a biomass refinery. Analyses proceed through the use of mass balances, energy balances, and empirical or theoretical models. Prerequisites: Biological Engineering [BIOL\_EN] 2180 (for Biological Engineering students) or Chemical Engineering [CH\_ENG] 2225 (for Chemical Engineering students) or instructor's consent.

**BIOL\_EN 4316. Biomass Refinery Operations. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 4316). Design and operation of processes for conversion and/or fractionation of biomass and associated upstream and downstream unit operations. Emphasis on separations and product recovery. Prerequisite: Biological Engineering [BIOL\_EN] 2180 or Chemical Engineering [CH\_ENG] 2225 (for Chemical Engineering students) or instructor's consent.

**BIOL\_EN 4350. Watershed Modeling Using GIS. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4720). Watershed evaluation using AVSWAT for hydrology, sediment yield, water quality; includes USLE, MUSLE, WEPP. Procedures for model calibration/sensitivity data analysis. Prerequisites: Biological Engineering [BIOL\_EN] 2180 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**BIOL\_EN 4370. Orthopaedic Biomechanics. 3 Credits.**

(same as Veterinary Medicine and Surgery [V\_M\_S] 4370) Engineering sciences will be leverage to create a comprehensive study of orthopaedic biomechanics. The tissue mechanics of bone and soft tissue will be studied along with applying structural analysis of the musculoskeletal system. Prerequisites: Engineering [ENGINR] 1200, Biological Engineering [BIOL\_EN] 3170, instructor's consent required. Graded on A/F basis only.

**BIOL\_EN 4380. Applied Electronic Instrumentation. 4 Credits.**

Fundamental concepts and theories, basic electronics, analog and digital circuits, signal conditioning, computer interfacing, measurement principles and techniques used in developing computer-based instrumentation systems. Prerequisite: Physics [PHYSCS] 2760.

**BIOL\_EN 4420. Introduction to Biomedical Imaging. 3 Credits.**

(same as Physics [PHYSCS] 4420). This course offers a broad introduction to medical imaging. Topics to be covered include the physics basics and instrumentation of X-ray CT, PET, SPECT, ultrasound, MRI and Optical Imaging, as well as recent developments in biomedical imaging. Prerequisites: PHYSCS 2760.

**BIOL\_EN 4470. Biomolecular Engineering and Nanobiotechnology. 3 Credits.**

Generation of biotechnological products, devices through integration of engineering approaches with contemporary biology, chemistry and nanotechnology starting at the molecular level. Prerequisites: senior/graduate standing or instructor's consent. Graded on A/F basis only.

**BIOL\_EN 4480. Physics and Chemistry of Materials. 3 Credits.**

(same as Physics [PHYSCS] 4190 and Chemistry [CHEM] 4490 and Nuclear Engineering [NU\_ENG] 4319). Physics and Chemistry of Materials is a 3 credit hours undergraduate/graduate level course offered every spring semester for students from Physics, Chemistry, Engineering and Medical Departments and consists of lectures, laboratory demonstrations, two mid term and one final exam. Graduate students will submit a term paper. Prerequisite: Physics [PHYSCS] 2760/ Chemistry [CHEM] 1320 or equivalent/prior approval by instructor.

**BIOL\_EN 4550. Design of Livestock Waste Management Systems. 3 Credits.**

Development and application of design criteria to the design of agricultural waste management facilities. Prerequisites: Chemistry [CHEM] 1310 and Civil Engineering [CV\_ENG] 3700, Mechanical and Aerospace Engineering [MAE] 3400 or instructor's consent.

**BIOL\_EN 4570. Fluorescent Imaging. 3 Credits.**

Principles and applications of fluorescent imaging. The course covers: Image formation in microscope; Fundamentals of fluorescence and fluorescent microscopy; molecular and cellular fluorescent imaging. Prerequisites: Biological Sciences [BIO\_SC] 1500 and Biological Engineering [BIOL\_EN] 2180 or instructor's consent.

**BIOL\_EN 4575. Computational Neuroscience. 4 Credits.**

(same as Biological Science [BIO\_SC] and Electrical and Computer Engineering [ECE] 4580). An interdisciplinary course with a strong foundation in quantitative science for students in biological-behavioral sciences. Prerequisites: Biological Science [BIO\_SC] 1010, 1500; Mathematics [MATH] 1500. Graded on A/F basis only.

**BIOL\_EN 4580. Mechanical Systems Engineering. 3 Credits.**

Fundamentals and applications of prime movers and power transmissions for the design of engineering systems. Prerequisites: Thermodynamics course, Fluid Mechanics course. Corequisite: Engineering [ENGINR] 2100 or Biological Engineering [BIOL\_EN] 4380 or instructor's consent.

**BIOL\_EN 4670. Photonics and Nanotechnologies in Optical Biosensors. 3 Credits.**

Latest applications of photonics and nanotechnologies in optical biochemical sensors will be reviewed. Prerequisite: Physics [PHYSCS] 2760. Graded on A/F basis only.

**BIOL\_EN 4770. Biomedical Optics. 3 Credits.**

Essential concepts and methods for applying optical techniques to biomedical diagnosis and therapy will be covered with major application examples being discussed. Prerequisite: Physics [PHYSCS] 2760 and Biological Engineering [BIOL\_EN] 3180; or instructor's consent.

**BIOL\_EN 4870. Molecular and Cell Mechanics. 3 Credits.**

Application of mechanics and engineering principles to biological systems at the cellular and molecular levels. Prerequisite: Engineering [ENGINR] 2200. Graded on A/F basis only.

**BIOL\_EN 4940. Engineering Internship. 2-5 Credit.**

Problem course following prior approved work experience. Problem selected by internship company representative, faculty problem adviser and student. Supervised by faculty problem advisor and presented in engineering report form. Prerequisite: advisor's consent.

**BIOL\_EN 4980. Biological Engineering Design. 3 Credits.**

Capstone design course for the Biological Engineering major. Design of biological system devices or processes. Prerequisite: senior standing or instructor's consent.

**BIOL\_EN 4990. Undergraduate Research in Biological Engineering. 1-5 Credit.**

Supervised independent study at the undergraduate level. Prerequisite: instructor's consent.

**BIOL\_EN 4995. Undergraduate Honors Research in Biological Engineering. 1-5 Credit.**

Open only to honor students in Biological Engineering. Independent investigation in biological engineering to be presented as a thesis. Prerequisite: advisor's consent.

**BIOL\_EN 7001. Topics in Biological Engineering. 1-3 Credit.**

Study of advanced developments in biological engineering.

**BIOL\_EN 7070. Bioelectricity. 3 Credits.**

Application of engineering approaches to understand bioelectricity at the cellular level including the equivalent circuit of cell membranes and the electronic design of patch-clamp amplifiers. Prerequisites: Physics [PHYSCS] 2760 and Biological Engineering [BIOL\_EN] 3180 or instructor's consent.

**BIOL\_EN 7080. Engineering Computation. 3 Credits.**

An introduction to numerical methods relevant to biological engineering in the context of scientific computing. Prerequisite: MATH 4100.

**BIOL\_EN 7150. Soil and Water Conservation Engineering. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7710). Urban and rural run-off and erosion analysis. Design and layout of erosion control structures. Prerequisites: graduate standing BIOL\_EN 2180 or CV\_ENG 3200, or instructor's consent.

**BIOL\_EN 7160. Food Process Engineering. 3 Credits.**

Study of transport phenomena and unit operations in food processing systems. Emphasis on fluid flow and heat transfer in food processing, preservation processes, refrigeration, freezing, psychometrics, and dehydration. Prerequisite: Biological Engineering [BIOL\_EN] 3180 or instructor's consent.

**BIOL\_EN 7170. Biomaterials Interfaces of Implantable Devices. 3 Credits.**

Surface structures and properties to improve biocompatibility will be studied. Engineering sciences and design will be leverage in the design of an improved biocompatible surface. Prerequisites: Biological Engineering [BIOL\_EN] 3170 or instructor's consent.

**BIOL\_EN 7231. Transport Phenomena in Materials Processing. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 7231). Applications of fluid flow, heat transfer, and mass transfer in steady-state and unsteady-state materials processing with applications to metals, polymers, and ceramics. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200, 3400, 4300 or equivalent; and Mathematics [MATH] 4100. Graduate Standing Required. Graded on A-F basis only.

**BIOL\_EN 7250. Irrigation and Drainage Engineering. 3 Credits.**

Soil, water, plant relationships. Water supplies and design of surface, sprinkler and drip irrigation systems. Surface and tile drainage. Prerequisites: Civil Engineering [CV\_ENG] 3700 or Mechanical and Aerospace Engineering [MAE] 3400 or Biological Engineering [BIOL\_EN] 2180.

**BIOL\_EN 7260. Food Process Engineering II. 3 Credits.**

Continuing study of transport phenomena and unit operations in food processing systems. Emphasis on fluid food evaporation concentration food dehydration, contact equilibrium processes and mechanical

separation processes. Prerequisite: graduate standing and Biological Engineering [BIOL\_EN] 7160 or instructor's consent.

**BIOL\_EN 7270. Design of Experiments and Statistical Quality Control for Process Engineers. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 7270). A practical statistical tool box for experimenters including comparison of process means, effects of variables, design and interpretation of factorial experiments, and statistical quality control. Prerequisite: experience with Excel or instructor's consent.

**BIOL\_EN 7310. Feedback Control Systems. 4 Credits.**

(same as Electrical and Computer Engineering [ECE] 7310). System modeling and time and frequency response, closed loop control, stability, continuous system design, introduction to discrete time control, software and hardware experiments on compensator design and PID control. Prerequisites: Mathematics [MATH] 4100. Graduate Standing Required. Graded A-F only. May be repeated for credit.

**BIOL\_EN 7315. Introduction to Bioprocess Engineering. 3 Credits.**

(same as CH\_ENG 7315). This general introduction to bioprocess engineering covers the fundamentals of microbiology and biochemistry in the context of a biomass refinery. Analysis proceed through the use of mass balances, energy balances, and empirical or theoretical models. Prerequisites: BIOL\_EN 2180 (for biological engineering students) or CH\_ENG 2225 (for chemical engineering students) or instructor's consent.

**BIOL\_EN 7316. Biomass Refinery Operation. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 7316). Design and operation of processes for conversion and/or fractionation of biomass and associated upstream and downstream unit operations. Emphasis on separations and product recovery. Prerequisite: Biological Engineering [BIOL\_EN] 2180 or Chemical Engineering [CH\_ENG] 2225 or instructor's consent.

**BIOL\_EN 7350. Watershed Modeling Using GIS. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7720). Watershed evaluation using AVSWAT for hydrology, sediment yield, water quality; includes USLE, MUSLE, WEPP, Procedures for model calibration/sensitivity data analysis. Prerequisites: Biological Engineering [BIOL\_EN] 2180 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**BIOL\_EN 7370. Orthopaedic Biomechanics. 3 Credits.**

(same as Veterinary Medicine and Surgery [V\_M\_S] 7370). Engineering sciences will be leverage to create a comprehensive study of orthopaedic biomechanics. The tissue mechanics of bone and soft tissue will be studied along with applying structural analysis of the musculoskeletal system. Prerequisites: Engineering [ENGINR] 1200 and Biological Engineering [BIOL\_EN] 3170. Instructor Consent Required. Graduate Standing Required. Graded on A/F Basis Only.

**BIOL\_EN 7380. Applied Electronic Instrumentation. 4 Credits.**

Fundamental concepts and theories, basic electronics, analog and digital circuits, signal conditioning, computer interfacing, measurement principles and techniques used in developing computer-based instrumentation systems. Prerequisite: graduate standing and Physics [PHYSICS] 2760.

**BIOL\_EN 7420. Introduction to Biomedical Imaging. 3 Credits.**

(same as PHYSICS 7420). This course offers a broad introduction to medical imaging. Topics to be covered include the physics basics and instrumentation of X-ray CT, PET, SPECT, ultrasound, MRI and Optical Imaging, as well as recent developments in biomedical imaging, as well

as recent developments in biomedical imaging. Prerequisites: PHYSICS 2760.

**BIOL\_EN 7470. Biomolecular Engineering and Nanobiotechnology. 3 Credits.**

Generation of biotechnological products, devices through integration of engineering approaches with contemporary biology, chemistry and nanotechnology starting at the molecular level. Prerequisites: senior/graduate standing or instructor's consent. Graded on A/F basis only.

**BIOL\_EN 7480. Physics and Chemistry of Materials. 3 Credits.**

(same as PHYSICS 7190 and NU\_ENG 7319 and CHEM 7490). Physics and Chemistry of Materials is a 3 credit hours undergraduate/graduate level course offered every spring semester for students from Physics, Chemistry, Engineering and Medical Departments and consists of lectures, laboratory demonstrations, two midterm and one final exam. Graduate students will submit a term paper. Prerequisite: PHYSICS 2760 / CHEM 1320 or equivalent/prior approval by instructor.

**BIOL\_EN 7550. Design of Livestock Waste Management Systems. 3 Credits.**

Development and application of design criteria to the design of agricultural waste management facilities. Prerequisites: graduate standing and Chemistry [CHEM] 1310 and Civil Engineering [CV\_ENG] 3700, Mechanical and Aerospace Engineering [MAE] 3400 or instructor's consent.

**BIOL\_EN 7570. Fluorescent Imaging. 3 Credits.**

Principles and applications of fluorescent imaging. The course covers: Image formation in microscope; Fundamentals of fluorescence and fluorescent microscopy; molecular and cellular fluorescent imaging. Prerequisites: Biological Sciences [BIO\_SC] 1500 and Biological Engineering [BIOL\_EN] 2180 or instructor's consent. Graded on A/F basis only.

**BIOL\_EN 7575. Computational Neuroscience. 4 Credits.**

(Same as BIO\_SC 7580 and ECE 7580). An interdisciplinary course with a strong foundation in quantitative science for students in biological-behavioral science. Prerequisites: BIO\_SC 1010, BIO\_SC 1500; MATH 1500. Graded on A-F basis only.

**BIOL\_EN 7580. Mechanical Systems Engineering. 3 Credits.**

Fundamentals and applications of prime movers and power transmissions for the design of engineering systems. Prerequisites: graduate standing and Thermodynamics course, Fluid Mechanics course. Corequisite: Engineering [ENGINR] 2100 or Biological Engineering [BIOL\_EN] 7380 or instructor's consent.

**BIOL\_EN 7670. Photonics and Nanotechnologies in Optical Biosensors. 3 Credits.**

Latest applications of photonics and nanotechnologies in optical biochemical sensors will be reviewed. Prerequisite: Physics [PHYSICS] 2760. Graded on A/F basis only. Graduate Standing Required.

**BIOL\_EN 7770. Biomedical Optics. 3 Credits.**

Essential concepts and methods for applying optical techniques to biomedical diagnosis and therapy will be covered with major application examples being discussed. Prerequisite: Physics [PHYSICS] 2760 and Biological Engineering [BIOL\_EN] 3180; or instructor's consent.

**BIOL\_EN 8001. Advanced Topics in Biological Engineering. 1-3 Credit.**

Study of advanced developments in biological engineering.

**BIOL\_EN 8085. Problems in Biological Engineering. 1-99 Credit.**

Supervised individual study at the graduate level. Prerequisite: departmental consent.

**BIOL\_EN 8087. Seminar in Biological Engineering. 1 Credit.**

Recent investigations in biological engineering and related fields. Discussion of current literature; preparation and presentation of papers.

**BIOL\_EN 8088. Advanced Seminar in Biological Engineering. 1 Credit.**

Student presentation and discussion of topical research. May be repeated for credit. Prerequisites: Biological Engineering [BIOL\_EN] 8087 and 8402 or instructor's consent.

**BIOL\_EN 8150. Natural Systems for Wastewater Treatment. 3 Credits.**

Emphasis is on the design, management and biological performance of lagoons, overland flow systems and constructed wetland. Prerequisite: graduate standing and Civil Engineering [CV\_ENG] 7230 and Biological Engineering [BIOL\_EN] 7150 or instructor's consent.

**BIOL\_EN 8170. Sensors and Biosensors. 3 Credits.**

The course covers basic principles of chemical and biological sensors, such as immobilization techniques, transducers (optical, electrical, etc.) and performance factors. Prerequisites: graduate standing or instructor's consent.

**BIOL\_EN 8180. Numerical Methods in Engineering Research. 3 Credits.**

Numerical techniques and case studies in Biological Engineering. Topics include basic numerical methods, mathematical representation of data, matrix algebra, ordinary and partial differential equations. Prerequisites: Mathematics [MATH] 4100.

**BIOL\_EN 8230. Advanced Ceramic Materials. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] and Mechanical and Aerospace Engineering [MAE] 8230). To provide an advanced level understanding between processing, properties, and microstructure of ceramic materials. Topics include crystallography, defect chemistry, transport properties, microstructure, and forming methods. Graded on A/F basis only.

**BIOL\_EN 8250. Water Management Theory. 3 Credits.**

Advanced studies in erosion control, irrigation, and drainage. Water resources engineering. Prerequisites: Mathematics [MATH] 1500, Computer Engineering and Computer Science course, Soils [SOIL] 4307/7307 and Soil Conservation course.

**BIOL\_EN 8270. Principles and Applications of Fluorescence. 3 Credits.**

Physical foundations of fluorescence, fluorophores, steady-state and lifetime measurements, and instrumentation. Applications in the life science from tissues staining to DNA probes. Prerequisite: graduate standing or instructor's consent. Graded on A/F basis only.

**BIOL\_EN 8280. Advanced Biological Transport Processes. 3 Credits.**

Principles of fluid flow, heat transfer, and mass transfer applied to (a) understanding of how the human body functions (from the cellular up to the system level) and (b) designing biomedical devices. An independent project/case-study of a relevant research topic also required. Prerequisite: graduate standing or instructor's consent.

**BIOL\_EN 8360. Food Extrusion. 2 Credits.**

Engineering principles and applications of single and twin screw food cooking extrusion systems. Modeling, control and optimization of

extrusion systems. Dough rheology. Prerequisite: Biological Engineering [BIOL\_EN] 7260.

**BIOL\_EN 8370. Materials Characterization Techniques. 3 Credits.**

Concepts and techniques in characterizing materials, including bulk and surface analyses. Techniques are presented in terms of use, sample requirements, and the engineering principles. Topics include: contact angle measurement, XPS, SEM, TEM, STM, AFM, XRD, and thermal analyses. Prerequisites: at least one undergraduate course in material science, engineer, or design.

**BIOL\_EN 8380. Modeling and Identification of Engineering Systems. 3 Credits.**

Generalized description of engineering systems, bond graph modeling, system identification techniques, and neural network approaches. Prerequisite: Mathematics [MATH] 4100.

**BIOL\_EN 8402. Research Methods. 2 Credits.**

(same as Food Science [F\_S] 8402). Review of literature; planning research projects; publication procedures. Prerequisite: graduate standing.

**BIOL\_EN 8470. Ultrasensitive Biodetection. 3 Credits.**

Multiplexing single-molecule, single-cell, nanobiotech analytical techniques to improve disease diagnosis, treatment, and understanding of biophenomena (membrane transport, gene expression, enzyme activities, cell communications). Graduate standing and Instructor's consent required. Graded A-F only.

**BIOL\_EN 8570. Microscopic Imaging. 3 Credits.**

Advanced topics in microscopic imaging with focus on applications of molecular and cellular imaging using fluorescent microscopy. Prerequisite: Biological Engineering [BIOL\_EN] 7570 or instructor's consent.

**BIOL\_EN 8770. Photon Migration and Optical Imaging in Turbid Media. 3 Credits.**

The essential concepts and techniques in optical imaging in turbid media will be covered including both forward problems and inverse reconstruction theories. Prerequisite: graduate standing; instructor's consent. Graded on A/F basis only.

**BIOL\_EN 8870. Molecular and Cell Mechanics. 3 Credits.**

Application of mechanics and engineering principles to biological systems at the cellular and molecular levels. Prerequisite: Engineering [ENGINR] 2200. Graded on A/F basis only. Graduate Standing required.

**BIOL\_EN 8990. Masters Thesis Research in Biological Engineering. 1-99 Credit.**

Independent investigation to be presented as a thesis. Graded on S/U basis only.

**BIOL\_EN 9990. Doctoral Dissertation Research in Biological Engineering. 1-99 Credit.**

Independent investigation to be presented as a thesis. Graded on S/U basis only.

## Biological Sciences (BIO\_SC)

**BIO\_SC 1001. Topics in Biological Science - General. 1-3 Credit.**

Selected topics not covered in current offerings. May not be used in partial fulfillment of requirements for a biological science in general education. May be graded on A/F or S/U basis.

**BIO\_SC 1002. Topics in Biological Sciences- Biological/Physical/Mathematics. 1-3 Credit.**

Selected topics not in regularly offered courses. Selected sections of this course may be graded either on A/F or S/U basis only.

**BIO\_SC 1010. General Principles and Concepts of Biology. 3 Credits.**

Emphasizes connections and applications to society and the human condition, science literacy, and critical thinking skills. A discussion of general principles and fundamental concepts of living things. Prerequisite: MATH 1100 or concurrent enrollment. This course is intended for non-science majors. No more than 5 credits for BIO\_SC 1010, BIO\_SC 1020, and BIO\_SC 1030.

**BIO\_SC 1020. General Biology Laboratory. 2 Credits.**

Laboratory exercises dealing with representative organisms and methods of modern biological sciences. Prerequisite: BIO\_SC 1010 or BIO\_SC 1400 or BIO\_SC 1010 concurrently. This course is intended for non-science majors. No more than 5 credits for BIO\_SC 1010, BIO\_SC 1020, and BIO\_SC 1030.

**BIO\_SC 1030. General Principles and Concepts of Biology with Laboratory. 5 Credits.**

Survey of general principles and basic concepts of life science, emphasizing applications to society and the human condition. Lectures address science literacy and critical thinking and laboratory exercises use representative organisms to complement lecture topics. Prerequisite: MATH 1100 or concurrent enrollment. This course is intended for non-science majors. No more than 5 credits for BIO\_SC 1010, BIO\_SC 1020, and BIO\_SC 1030.

**BIO\_SC 1060. Basic Environmental Studies. 3 Credits.**

Considers the ecosystem, energy and biogeochemical cycles and population dynamics; relation of the environment to agriculture and technology, pollution, power and food production; politico-economic considerations; moral and ethical issues. For non-science majors.

**BIO\_SC 1100. Introductory Zoology with Laboratory. 5 Credits.**

(same as F\_W 1100). Introduces important principles and concepts of zoology. Emphasizes cell biology; evolution; genetics; ecology; structure, function, development of the organism.

**BIO\_SC 1200. General Botany with Laboratory. 5 Credits.**

Introduction to study of plants. Emphasis on structure, growth, physiology, genetics and reproduction of plants.

**BIO\_SC 1400. Evolution for Everyone. 3 Credits.**

This course will explore the application of evolutionary theory to modern human affairs. We will study the processes involved in evolution and investigate evolutionary interpretations of human social behavior (e.g., psychology, mate choice, economics, religion, and morality). No credit if student has received credit for BIO\_SC 2060 or BIO\_SC 4600.

**BIO\_SC 1500. Introduction to Biological Systems with Laboratory. 3-5 Credit.**

Basic concepts and principles of the structure and function of living systems, from cells to populations. Foundation course for science students intending to complete a 3-semester sequence that also includes genetics and cell biology. Prerequisites: MATH 1100 and high school chemistry.

**BIO\_SC 1500H. Introduction to Biological Systems with Laboratory Honors. 3-5 Credit.**

Basic concepts and principles of the structure and function of living systems, from cells to populations. Foundation course for science

students intending to complete a 3-semester sequence that also includes genetics and cell biology. Prerequisites: MATH 1100 and high school chemistry. Honors eligibility required.

**BIO\_SC 2001. Topics in Biological Sciences - General. 1-3 Credit.**

Selected topics not covered in current offerings. May not be used in partial fulfillment of requirements for a biological science in general education. May be graded on A/F or S/U basis.

**BIO\_SC 2002. Topics in Biological Sciences- Biological/Physical/Mathematics. 1-3 Credit.**

Selected topics not covered in regularly offered courses. Selected sections of this course may be graded either on A/F or S/U basis only. Prerequisite: a course in general biology.

**BIO\_SC 2010. Undergraduate Seminar in Biological Sciences. 1-3 Credit.**

Discussion and critical evaluation of current topics in biological sciences for intermediate-level students. Some sections may be graded on either A/F or S/U basis only. Prerequisite: sophomore standing.

**BIO\_SC 2020. How the Brain Works. 1 Credit.**

Basic structure and function of the brain; left and right brain studies; gender differences; learning and memory; brain disorders.. Prerequisite: BIO\_SC 1010.

**BIO\_SC 2060. Community Biology. 3 Credits.**

Principles of population biology, ecology, and evolution, including consideration of human impacts on biological communities and ecosystems. Prerequisite: BIO\_SC 1010 or equivalent. Not open to biology majors.

**BIO\_SC 2100. Infectious Diseases. 3 Credits.**

An introduction to the basic science of bacterial, viral, protozoan, fungal and helminth infections, including discussions of how illness has influenced or been affected by public policy and culture. Prerequisite: BIO\_SC 1010. Not open to Biology Majors.

**BIO\_SC 2200. General Genetics. 4 Credits.**

Principles of inheritance in plants and animals; structure and use of genetic material, transmission of genetic information, linkage, modification of genetic information, regulation of genetic activity, population genetics. Prerequisites: BIO\_SC 1500 and CHEM 1320 (or concurrent enrollment).

**BIO\_SC 2300. Introduction to Cell Biology. 4 Credits.**

Analysis of cellular organization and function at the molecular level. The mechanisms underlying cellular trafficking, cell motility, and signaling within cells and between cells and their environment will be emphasized. Prerequisites: BIO\_SC 2200.

**BIO\_SC 2300H. Introduction to Cell Biology- Honors. 4 Credits.**

Analysis of cellular organization and function at the molecular level. The mechanisms underlying cellular trafficking, cell motility, and signaling within cells and between cells and their environment will be emphasized. Prerequisites: BIO\_SC 2200. Honors eligibility required.

**BIO\_SC 2600. Ornithology. 4 Credits.**

(same as F\_W 2600). Structure, identification, habits, importance of regional birds. Field work, lectures, lab. Prerequisites: 5 hours biology or instructor's consent.

**BIO\_SC 2700. Ichthyology. 4 Credits.**

(same as F\_W 2700). A broad introduction to the biology and ecology of fishes. Emphasis will be placed on understanding the adaptations fishes



exhibit to aspects of their environment. Includes lab. Prerequisites: 8 hours biology or equivalent.

**BIO\_SC 2940. Internship in Biological Science. 1-3 Credit.**

Work experience in a non-profit, for profit, or governmental organization relevant to the biological sciences. Intended for students doing internships in which independent research is less than 50% of the experience. Prerequisites: junior standing, instructor's consent, 12 hours of biological science. Graded on S/U basis only.

**BIO\_SC 2960. Readings in Biological Science. 1-3 Credit.**

Supervised reading in biological literature. May be repeated up to six hours total credit. Selected sections of this course may be graded either on A/F or S/U basis only. May not be used in partial fulfillment of Arts and Science foundation requirement. Prerequisites: instructor's consent.

**BIO\_SC 2965H. Honors Readings in Biological Literature. 1-3 Credit.**

Selected readings in biological literature for Honors, in consultation with instructor. Prerequisite: overall 3.3 GPA; instructor's consent. May not be used in partial fulfillment of Arts and Science foundation requirement. Honors eligibility required.

**BIO\_SC 3002. Topics in Biological Sciences- Biological/Physical/Mathematics. 1-3 Credit.**

Selected topics not in regularly offered courses. Selected sections of this course may be graded either on A/F or S/U basis only. Prerequisite: instructor's consent.

**BIO\_SC 3010. Professional Skills. 1 Credit.**

This course will focus on application and interview skills for students interested in medical school. Prerequisites: junior standing; 3.4 GPA; instructor's consent. Restricted to biology majors. Graded on S/U basis only.

**BIO\_SC 3050. Genetics and Society. 3 Credits.**

Introduction to genetics, emphasizing the impact of genetics on human society. Human evolution, molecular genetics, genetic engineering in medicine and agriculture. An intensive writing course. Prerequisite: a college science course or equivalent (advanced high school biology).

**BIO\_SC 3210. Plant Systematics. 4 Credits.**

Principles of classification of plants; survey of diversity in flowering plant families; identification of local flora; use of keys. Includes lab. Prerequisite: 8 hours of Biological Sciences.

**BIO\_SC 3250. Parasitology. 4 Credits.**

(same as BIOMED 3250). Parasitism is considered as a fundamental type of interspecies interaction. Principles of parasitism as they apply to animals are presented with emphasis on parasite morphology, biology and host parasite relationships. Includes lab. Prerequisite: 8 hours of biology.

**BIO\_SC 3260. Invertebrate Zoology. 4 Credits.**

Structure, ecology and phylogeny of the invertebrate phyla. Includes lab. Prerequisites: BIO\_SC 1100 or BIO\_SC 1500.

**BIO\_SC 3360. Herpetology. 4 Credits.**

The biology, ecology, taxonomy, and distribution of amphibians and reptiles. Some Saturday field trips. Prerequisite: 8 hours Biological Sciences or equivalent.

**BIO\_SC 3400. Evolution and Ecology. 3 Credits.**

Introduction to principles of evolution and ecology. Topics include natural selection, adaptation, phylogenetic analysis, human evolution, population growth and regulation, population interactions, ecosystem ecology, and human impacts on ecological processes. Prerequisites: BIO\_SC 2200.

**BIO\_SC 3510. Biology of Fungi. 3 Credits.**

(same as PLNT\_S 3510). The diverse roles of fungi in the biosphere will be explored by considering fungi we eat, fungi which destroy our food, fungi in folklore and fungi as global nutrient recyclers. Includes lab. Prerequisite: BIO\_SC 1100, BIO\_SC 1200, or BIO\_SC 1500.

**BIO\_SC 3650. General Ecology. 5 Credits.**

Principles of populations, coevolution, density factors, competition; physical environment; concept of community, trophic structure, biotic succession; characterization of biomes, man in ecosystem. Biology majors having completed BIO\_SC 3100: 2 hours credit. Prerequisites: 10 hours in biology and junior standing.

**BIO\_SC 3655. Tropical Ecology: Methods and Applications. 3 Credits.**

Field study of tropical community; additional fee for transportation and accommodations required. Prerequisite: BIO\_SC 3100, 3650, 4600 or 4660.

**BIO\_SC 3660. Mammalogy. 4 Credits.**

(same as F\_W 3660). Taxonomy, distribution, structure, habits, importance of mammals; emphasizes those of central United States. Includes lab. Prerequisites: 8 hours of biology or instructor's consent.

**BIO\_SC 3700. Animal Physiology. 5 Credits.**

Introduces concepts of vertebrate organ function and homeostatic control emphasizing mammalian physiology. Some comparisons to function in other vertebrates and strategies for coping with environmental stresses introduced. Includes lab. Prerequisite: BIO\_SC 2300.

**BIO\_SC 3710. Introductory Entomology. 3 Credits.**

(same as PLNT\_S 3710). Holistic biology of insects, including anatomy, physiology, behavior, ecology, and management. Prerequisites: BIO\_SC 1100, 1200, or 1500 or equivalent.

**BIO\_SC 3715. Insect Diversity. 2 Credits.**

(same as PLNT\_S 3715). Laboratory emphasizing external insect anatomy, classification, and identification to the family level. Insect collection is required. Prerequisite: concurrent enrollment or previous satisfactory completion of PLNT\_S 3710/BIO\_SC 3710.

**BIO\_SC 3750. General Microbiology. 4 Credits.**

Principles of microbiology. Includes lab. Prerequisite: BIO\_SC 2200 and 2300 completed with C range grades.

**BIO\_SC 3780. Genetics Laboratory. 2 Credits.**

Experimental genetic studies of *Drosophila*, corn and microorganisms. Prerequisite: C range grade or better in BIO\_SC 2200 or instructor's consent.

**BIO\_SC 3790. Developmental Biology Laboratory. 2 Credits.**

Laboratory studies of development in sea urchin, chicken and roundworm. Prerequisites: BIO\_SC 4972 or co-enrollment in 4972.

**BIO\_SC 3800. Developmental Biology. 3 Credits.**

Analysis of the molecular, genetic, cellular, and morphological processes responsible for phenotypic changes in developing organisms. A variety of experimental systems are discussed to identify common mechanisms used by developing organisms. Prerequisites: BIO\_SC 2200, 2300, CHEM 2100.

**BIO\_SC 4002. Topics in Biological Science - Biological/Physical/Mathematics. 1-3 Credit.**

Selected topics not in regularly offered courses. Prerequisite: instructor's consent and senior standing. May be repeated up to 2 times for credit.

**BIO\_SC 4085. Problems in Biological Sciences. 1-3 Credit.**

Individual supervised work to supplement regularly organized courses in biology; introduction to research. Selected sections of this course may be graded either on A/F or S/U basis only. Prerequisites: junior standing and instructor's consent.

**BIO\_SC 4100. Limnology. 3-4 Credit.**

(same as F\_W 4100). (lecture/lab: 4 hrs.; lecture only: 3 hrs.) Ecology of inland waters with emphasis on productivity. Prerequisites: senior standing or BIO\_SC 3650.

**BIO\_SC 4300. Analysis of Biological Macromolecules. 3 Credits.**

Theory/application of techniques used for characterization of proteins, nucleic acids; topics: sedimentation velocity; equilibrium; sucrose density gradients; electrophoresis; spectrophotometry. Prerequisites: BIO\_SC 2300 or BIOCHM 4270; MATH 1500 and one year Physics.

**BIO\_SC 4310. Physics in Cell and Developmental Biology. 3 Credits.**

(same as PHYSICS 4310). Discusses the role of physical mechanisms in specific cellular and developmental processes and phenomena, in particular those characterizing the embryonic stage of multicellular organisms. Each process and phenomenon is first described in biological terms and then within a physical model, with special emphasis on the interplay between the two descriptions. Prerequisite: instructor's consent or PHYSICS 1220 or 2760 and BIO\_SC 2300.

**BIO\_SC 4320. Plant Physiology. 3-5 Credit.**

(same as PLNT\_S 4320). Modern physiology of higher plants using common cultivated plants as examples. May be taken with or without laboratory. Prerequisites: BIO\_SC 1200 or 1500 and 5 hours Chemistry.

**BIO\_SC 4328. Introductory Radiation Biology. 3 Credits.**

(same as NU\_ENG 4328, RADIOL 4328). Concepts of ionizing radiations, their actions on matter through effects on simple chemical systems, biological molecules, cell, organisms, man. Prerequisite: junior standing, Sciences/Engineering; one course in Biological Sciences and Physics/Chemistry; or instructor's consent.

**BIO\_SC 4400. Plant Anatomy. 4 Credits.**

(same as PLNT\_S 4400). Comparative structure, growth of meristems; development, structure of important cell types, tissues, tissue systems; comparative anatomy of stem, root, leaf. Emphasizes anatomy of gymnosperms, angiosperms. Includes lab. Prerequisites: BIO\_SC 1200 or equivalent.

**BIO\_SC 4500. Neurobiology. 3 Credits.**

Vertebrate and invertebrate neurobiology, including cell and molecular biology of the neuron, neurophysiology, neuroanatomy, neuroethology and developmental neurobiology. Prerequisites: BIO\_SC 2300 or 3700 or instructor's consent.

**BIO\_SC 4560. Sensory Physiology and Behavior. 3 Credits.**

Basic principles of coding and integration of sensory stimuli; neural correlates of animal behavior; environmental influences on postnatal sensory development. Prerequisite: BIO\_SC 4500. Graded on A/F basis only.

**BIO\_SC 4580. Computational Neuroscience. 4 Credits.**

(same as ECE 4580 and BIOL\_EN 4575). An interdisciplinary course with a strong foundation in quantitative sciences for students in biological and behavioral science and an introduction to experimental methods for students from quantitative sciences. Prerequisites: BIO\_SC 1010 or 1500; MATH 1500.

**BIO\_SC 4600. Evolution. 3 Credits.**

Surveys various processes in organic evolution and underlying genetic mechanisms. Prerequisite: BIO\_SC 2200.

**BIO\_SC 4640. Behavioral Biology. 3-4 Credit.**

Comparative study of animal ethology. Principles of animal ethology illustrated in different animal phyla. May be taken with Laboratory for 4 credits. Prerequisites: BIO\_SC 1500 and one additional upper-level course in Biological Sciences or Psychology.

**BIO\_SC 4642. Animal Communication. 3 Credits.**

Physical properties of sensory stimuli, receptor mechanisms, functional significance of communication behavior, and multidisciplinary and experimental approaches to current research in animal communication. Prerequisites: BIO\_SC 2300 and PHYSICS 1220 or equivalent.

**BIO\_SC 4660. Plant Population Biology. 4 Credits.**

Covers the ecological and evolutionary processes that influence the distribution and abundance of plant species. Topics include evolution of life history schedules, gender evolution, population growth and demography, competition, herbivory, plant-pollinator interactions, clonal growth, and plant community structure. Includes lab. Prerequisites: 2 courses in Biological Sciences.

**BIO\_SC 4670. Avian Ecology. 3 Credits.**

Advanced examination of ecological patterns in birds. Explores the environmental factors affecting the evolution of avian behavior, morphology, community structure and distribution. Prerequisites: BIO\_SC 3100 or 3650; 2600.

**BIO\_SC 4950. Undergraduate Research in Biology. 1-3 Credit.**

Individually directed field or laboratory research for upperclass students under faculty supervision. Project must be arranged by student and faculty member prior to registration. Prerequisites: Overall GPA 2.75; 20 hours of Biological Sciences and/or Chemistry; instructor's consent. May be repeated to a maximum of 6 hours.

**BIO\_SC 4950H. Honors Research in Biology. 1-3 Credit.**

Individually directed field or laboratory research for upper-level Honors students, in consultation with a faculty member. Project must be arranged by student and faculty member prior to registration. May be repeated for credit. Prerequisite: overall GPA 3.3; instructor's consent; biology or microbiology major. Honors eligibility required. Graded on A/F basis only.

**BIO\_SC 4952. Undergraduate Research in Biology. 1-3 Credit.**

Individually directed field or laboratory research for upperclass students under faculty supervision. Project must be arranged by student and faculty member prior to registration. Prerequisites: BIO\_SC 4950; overall GPA 2.75; instructor's consent. May be repeated to a maximum of 6 hours.

**BIO\_SC 4952H. Honors Research in Biology. 1-3 Credit.**

Continuation of research program. Successful completion requires public presentation and leads to degree with Honors in biological sciences. May be repeated for credit for maximum of 6 hours. Prerequisites: BIO\_SC 4950H; overall GPA 3.3; instructor's consent. Honors eligibility required. Graded on A/F basis only.

**BIO\_SC 4960. Special Readings in Biological Sciences. 1-3 Credit.**

Independent readings and discussions of topics in biology selected in consultation with supervising faculty member. Selected sections of this course may be graded either on A/F or S/U basis only. Prerequisites: senior standing in Biological Sciences and instructor's consent.

**BIO\_SC 4970. Neurobiology Laboratory. 3 Credits.**

Laboratory experience with experimental neurobiology, with emphasis on neural networks, motor systems, and developmental neurobiology. Prerequisites: BIO\_SC 3700 or 4500 or instructor's consent.

**BIO\_SC 4974. Molecular Biology Laboratory. 3 Credits.**

(same as BIOCHM 4374). Emphasizes recently developed genetic and biochemical techniques; illustrates how they apply to contemporary problems in biological research. Prerequisites: BIO SC 2200, BIOCHM 4272 or concurrent registration in BIO\_SC 4976.

**BIO\_SC 4976. Molecular Biology. 3 Credits.**

Molecular mechanisms of DNA replication, mutation, recombination and gene expression in prokaryotes, eukaryotes, and their viruses; gene fine structure; genetic engineering. Prerequisites: BIO\_SC 2200 and 2300.

**BIO\_SC 4978. Cancer Biology. 3 Credits.**

(same as BIOCHM 4978). The cellular and molecular basis of cancer, with emphasis on the application of genomics, proteomics, and genetic manipulations in model organisms to the study of cancer biology. Prerequisites: BIO\_SC 2200, 2300.

**BIO\_SC 4980. Cellular Interactions in Health and Disease. 3 Credits.**

The cell as a functional unit. Prerequisites: 10 hours Biological Sciences and 5 hours Physics and 5 hours Organic Chemistry; some background in Biochemistry and/or Molecular Biology is strongly recommended.

**BIO\_SC 4982. Human Inherited Diseases. 3 Credits.**

Analysis of the molecular and cellular mechanisms underlying inherited diseases in humans. Topics include genetics of sex determination, metabolic disorders, cancer, blood groups, transplantation, AIDS. Prerequisites: BIO\_SC 2200 and 2300.

**BIO\_SC 4983. Molecular Ecology. 4 Credits.**

Application of molecular genetic techniques to topics in ecology and population biology such as sex ratios, dispersal, mating systems, biogeography and conservation genetics. Prerequisites: BIO\_SC 2200 or equivalent and BIO\_SC 3650.

**BIO\_SC 4984. Mammalian Reproductive Biology. 3 Credits.**

Adult reproductive anatomy, physiology and behavior; gametogenesis and fertilization; placentation; sexual differentiation; parturition; maternal behavior and lactation; puberty; reproductive aging; reproductive ecology. Prerequisites: junior standing and 15 hours of Biological Sciences.

**BIO\_SC 4986. Neurology of Motor Systems. 3 Credits.**

Examination of the function of neural networks at all levels, from properties of single neurons to large collections of neural elements. Prerequisites: BIO\_SC 3700 or instructor's consent.

**BIO\_SC 4988. Nerve Cells and Behavior. 3 Credits.**

The cellular basis of behavior. Molecular and cellular properties of nerve cells, as related to behavior, will be represented and discussed. Prerequisite: BIO\_SC 3700 or instructor's consent.

**BIO\_SC 4990. Vertebrate Histology and Microscopic Anatomy. 5 Credits.**

Microscopic anatomy of vertebrate tissues and organs. Includes lab. Prerequisites: junior standing; BIO\_SC 2300 and 3700, or equivalent are recommended.

**BIO\_SC 4994. Senior Seminar. 1-3 Credit.**

Readings and critical evaluation of selected problems and theories in biology. Offered in one or more sections, with specialized disciplinary emphasis. Prerequisites: Biological Sciences major, senior standing.

**BIO\_SC 7002. Topics in Biological Sciences. 1-99 Credit.**

Advanced topics not in regularly offered courses. Prerequisites: instructor's consent. May be repeated for credit. Graded on A/F basis only.

**BIO\_SC 7100. Limnology. 3-4 Credit.**

(same as F\_W 7100). (lecture/lab: 4 hrs.; lecture only: 3 hrs.) Ecology of inland waters with emphasis on productivity. Prerequisites: graduate standing or BIO\_SC 3650.

**BIO\_SC 7300. Analysis of Biological Macromolecules. 3 Credits.**

Theory/application of techniques used for characterization of proteins and nucleic acids. Topics include sedimentation velocity; equilibrium; sucrose density gradients; electrophoresis; spectrophotometry. Prerequisite: BIO\_SC 2300; BIOCHM 4270; MATH 1500; 1 year of physics. Graded on A/F basis only.

**BIO\_SC 7310. Physics in Cell and Developmental Biology. 3 Credits.**

(same as PHYSICS 7310 and MPP 7300). Discusses the role of physical mechanisms in specific cellular and developmental processes and phenomena, in particular those characterizing the embryonic stage of multicellular organisms. Each process and phenomenon is first described in biological terms and then within a physical model, with special emphasis on the interplay between the two descriptions. Prerequisite: graduate standing and instructor's consent or PHYSICS 1220 or 2760 and BIO\_SC 2300.

**BIO\_SC 7320. Plant Physiology. 3 Credits.**

(same as PLNT\_S 7320). Modern physiology of higher plants using common cultivated plants as examples. May be taken with or without laboratory. Prerequisites: BIO\_SC 1200 or 1500 and 5 hours Chemistry.

**BIO\_SC 7328. Introductory Radiation Biology. 3 Credits.**

(same as NU\_ENG , RADIOL and V\_M\_S 7328). Prerequisite: graduate standing required.

**BIO\_SC 7350. Summer Institute in Biotechnology. 3 Credits.**

Development of experiments in molecular genetics for use in high school biology laboratories. May be repeated for credit. Prerequisite: graduate standing and instructor's consent.

**BIO\_SC 7374. Molecular Biology Laboratory. 3 Credits.**

(same as BIOCHM 7374). Emphasizes recently developed genetic and biochemical techniques; illustrates how they apply to contemporary problems in biological research. Prerequisites: BIO\_SC 2200, BIOCHM 4272 or concurrent registration in BIO\_SC 4976.

**BIO\_SC 7400. Plant Anatomy. 4 Credits.**

(same as PLNT\_S 7400). Comparative structure, growth of meristems; development, structure of important cell types, tissues systems; comparative anatomy of stem root, leaf. Emphasizes anatomy of gymnosperms, angiosperms. Includes lab. Graded on A/F basis only. Prerequisites: BIO\_SC 1200 or equivalent.

**BIO\_SC 7490. Vertebrate Histology and Microscopic Anatomy. 5 Credits.**

Microscopic anatomy of vertebrate tissues and organs. Prerequisites: BIO\_SC 2300 and 3700, or equivalent. Graded on A/F basis only.

**BIO\_SC 7500. Neurobiology. 3 Credits.**

Vertebrate and invertebrate neurobiology, including cell and molecular biology of the neuron, neurophysiology, neuroanatomy, neuroethology and developmental biology. Prerequisites: BIO\_SC 2300 or 3700; graduate standing. Graded on A/F basis only.

**BIO\_SC 7560. Sensory Physiology and Behavior. 3 Credits.**

Basic principles of coding and integration of sensory stimuli; neural correlates of animal behavior; environmental influences on postnatal sensory development. Prerequisite: BIO\_SC 4500 or equivalent.

**BIO\_SC 7580. Computational Neuroscience. 4 Credits.**

(Same as BIOL\_EN 7575 and ECE 7580). An interdisciplinary course with a strong foundation in quantitative sciences for students in biological and behavioral sciences and an introduction to experimental methods for students from quantitative sciences. Prerequisites: BIO\_SC 1010 or 1500, MATH 1500.

**BIO\_SC 7640. Behavioral Biology. 3 Credits.**

Comparative study of animal ethology. Principles of animal ethology illustrated in different animal phyla. Prerequisites: BIO\_SC 1500 and one additional upper-level course in BIO\_SC or PSYCH.

**BIO\_SC 7660. Plant Population Biology. 4 Credits.**

Covers the ecological and evolutionary processes that influence the distribution and abundance of plant species. Topics include evolution of life history schedules, gender evolution, population growth and demography, competition, herbivory, plant-pollinator interactions, clonal growth, and plant community structure. Prerequisites: 2 courses in BIO\_SC. Graduate standing required.

**BIO\_SC 7670. Avian Ecology. 3 Credits.**

Advanced examination of ecological patterns in birds. Explores the environmental factors affecting the evolution of avian behavior, morphology, community structure and distribution. Prerequisites: BIO\_SC 3100 or 3650; 2600.

**BIO\_SC 7976. Molecular Biology. 3 Credits.**

Molecular mechanisms of DNA replication, mutation, recombination and gene expression in prokaryotes, eukaryotes, and their viruses; gene fine structure; genetic engineering. Prerequisites: BIO\_SC 2200 and 2300.

**BIO\_SC 7978. Cancer Biology. 3 Credits.**

(same as BIOCHM 7978). The course will cover major molecular and cellular aspects of cancer. Students will read original research articles, present overviews and lead class discussions. Prerequisites: BIOCHM 4270, BIO\_SC 2300 and 4976 or equivalent.

**BIO\_SC 7980. Cellular Interactions in Health and Disease. 3 Credits.**

Advanced discussion of topics in cell biology and genetics as they relate to health and disease. Prerequisite: instructor's consent. Graded on A/F basis only.

**BIO\_SC 7982. Human Inherited Diseases. 3 Credits.**

Advanced analysis of the molecular basis for genetic disorders in humans. Topics will include both Mendelian and complex traits with readings from the primary literature. Prerequisites: BIO\_SC 2200 and instructor's consent. Graded on A/F basis only.

**BIO\_SC 7986. Neurology of Motor Systems. 3 Credits.**

Examination of the function of neural networks at all levels, from properties of single neurons to large collections of neural elements. Prerequisite: BIO\_SC 3700. Graded on A/F basis only.

**BIO\_SC 7990. Non-thesis Research. 1-99 Credit.**

Independent research not leading to a thesis. Prerequisites: graduate standing and instructor's consent.

**BIO\_SC 8002. Topics in Biological Sciences- Biological/Physical/Mathematics. 1-99 Credit.**

Advanced topics not in regularly offered courses. Prerequisite: instructor's consent.

**BIO\_SC 8050. Professional Survival Skills. 2 Credits.**

Introduction to resources, facilities, and communication skills for professional careers in biological sciences. Topics include computer resources, accessing scientific literature, making slides and figures, grantsmanship, resume preparation, manuscript review, and research presentation.

**BIO\_SC 8060. Ethical Conduct of Research. 1 Credit.**

(same as BIOCHM 8060). Discussion of ethical issues in biological research, including the rules and conventions for appropriate research conduct. Graded on S/U basis only.

**BIO\_SC 8080. Workshop in Area of Specialization. 1 Credit.**

Intensive course in the theory and methodology of biological investigation. Conducted by visiting scientists. Offered in one or more specialized sections. Prerequisites: graduate standing or instructor's consent. May be repeated for credit.

**BIO\_SC 8085. Problems in Biological Sciences. 1-99 Credit.**

Research not expected to terminate in thesis, or individual advanced study in special subjects. Prerequisites: graduate standing and instructor's consent.

**BIO\_SC 8087. Seminar. 1 Credit.**

Current topics in the biological sciences. Open to all graduate students. Offered S/U. Prerequisite: graduate standing.

**BIO\_SC 8090. Research in Biological Sciences. 1-99 Credit.**

Research leading to thesis. Prerequisites: graduate standing and instructor's consent. Graded on S/U basis only.

**BIO\_SC 8187. Seminar in Areas of Specialization. 1 Credit.**

Offered each semester in one or more specialized sections followed by the topic title of the seminar. Graded on S/U basis only. Prerequisite: graduate standing.

**BIO\_SC 8300. Advanced Plant Genetics. 3 Credits.**

Genetic approaches to molecular and biochemical studies in maize, wheat, and Arabidopsis. Prerequisites: General Genetics and course in Cell Biology or Plant Physiology.

**BIO\_SC 8310. Fungal Genetics and Biology. 3 Credits.**

Introduction to fungal research, with an emphasis on genetics, biochemistry, cell and molecular biology, and pathogenicity of fungi. Graded A/F only.

**BIO\_SC 8320. Developmental Genetics. 3 Credits.**

An overview of various developing systems amenable to classical and molecular genetic analysis. Specific developmental phenomena will be introduced in particular model systems, with an emphasis on experimental approaches used to address the underlying mechanisms. Prerequisites: BIO\_SC 2200 and BIOCHM 7270, BIOCHM 7272, or equivalent; graduate standing.

**BIO\_SC 8330. Stem Cell Biology. 3 Credits.**

A comparative approach to stem cell biology, with emphasis on embryonic, neural and bone marrow-derived stem cells in rodents and humans. Ethical considerations associated with the use of stem cells to study development and repair mechanisms will also be addressed. Prerequisite: BIO\_SC 2300 and graduate standing. Graded on A/F basis only.

**BIO\_SC 8340. Advanced Microscopy Techniques. 3 Credits.**

Electron microscopy and modern light microscopy techniques including epifluorescence, confocal fluorescence microscopy, low light video

microscopy, differential interference optics, and computerized image analysis. Prerequisite: BIO\_SC 4990 or 8350 and instructor's consent.

**BIO\_SC 8350. Advanced Cell Biology. 3 Credits.**

Structure and function of membranes; cell ultrastructure; organellar function; cellular movement; microtubules; microfilaments; mitosis and meiosis. Prerequisites: BIO\_SC 2300; graduate standing; instructor's consent.

**BIO\_SC 8362. Introduction to Plant Metabolism. 2 Credits.**

(same as PLNT\_S and BIOCHM 8362). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant metabolism. Graded on A/F basis only.

**BIO\_SC 8365. Introduction to Molecular Cell Biology. 2 Credits.**

(same as BIOCHM/Plant Science PLNT\_S 8365). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis on plant biology. This course examines the basic concepts and techniques used to understand molecular cell biology. Graded on A/F basis only.

**BIO\_SC 8370. Plant Developmental Biology. 3 Credits.**

Critical discussions of recent publications in plant development, with particular focus on developmental genetics.

**BIO\_SC 8440. Integrative Neuroscience I. 3 Credits.**

(same as NEUROSCI 8440). Organization, development and function of the nervous system focusing on cellular and molecular processes. Prerequisite: graduate standing. Graded on A/F basis only.

**BIO\_SC 8442. Integrative Neuroscience II. 3 Credits.**

(same as NEUROSCI 8442). Organization and function of the nervous system at the systems level to examine processes of behavior and cognition. Prerequisite: graduate standing. Graded on A/F basis only.

**BIO\_SC 8450. Developmental Neurobiology. 3 Credits.**

Principles of neural development. Development of neuron and nerve patterns, axon growth, synapses, and development of behavior. Prerequisite: BIO\_SC 4500 or equivalent.

**BIO\_SC 8460. Advanced Cancer Biology. 3 Credits.**

A study of the molecular basis of cancer, including topics in tumor cell biology, interactions between cancer cells and normal cells, mechanisms of metastasis, and novel approaches to development of new chemotherapies.

**BIO\_SC 8505. Introduction to Plant Stress Biology. 2 Credits.**

(same as PLNT\_S 8505.) This course is part of a series that aims to provide a solid conceptual foundation to interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant stress biology. Graded on A/F basis only.

**BIO\_SC 8520. Sensory Ecology. 3 Credits.**

A study of information exchange and acquisition in organisms, with an emphasis on communication, orientation, and predator detection. The course will also examine the effects of biotic and abiotic factors on sensory systems.

**BIO\_SC 8600. Design of Ecological Experiments. 2 Credits.**

Principles of experimental design in the context of ecological, behavioral, and evolutionary research. Prerequisite: STAT 1400.

**BIO\_SC 8610. Current Concepts in Conservation Biology. 2 Credits.**

Survey of current concepts in conservation biology literature. Discussions will provide students with an appreciation of the historical development of concepts, the interdisciplinary nature of conservation problems, and the research required for effective solutions.

**BIO\_SC 8620. Phylogenetic Methods and Applications. 4 Credits.**

A review of principles for constructing and testing phylogenies followed by a survey of methods for inferring ancestral characteristics and adaptive features in living species.

**BIO\_SC 8650. Ecological and Evolutionary Genomics. 2 Credits.**

(same as PLNT\_S 8650). This course is designed to give a background in evolution and then explore an exciting new field: Ecological and evolutionary genomics. We will study genes that affect fitness and how whole genomes evolve. Graded on A/F basis only.

**BIO\_SC 8700. Ecological Genetics. 3 Credits.**

Population genetics and evolutionary theory, with emphasis on studies of natural populations. Prerequisites: BIO\_SC 2200, 3100 or 3650, and STAT 1400 or equivalent.

**BIO\_SC 8720. Speciation. 3 Credits.**

Advanced discussion of species concepts and the processes of formation of species. Prerequisites: BIO\_SC 2200 and 4600.

**BIO\_SC 8724. College Science Teaching. 3 Credits.**

(same as LTC 8724). Study of learner characteristics, teaching strategies, and research findings related to teaching science at the post-secondary level. Graduate standing required.

**BIO\_SC 8725. Science Outreach: Public Understanding of Science. 1-2 Credit.**

(same as AN\_SCI 8725, PHYSCS 8350 and LTC 8725). Development of presentations to adult audiences on the science underlying issues of current interest. May be repeated for credit.

**BIO\_SC 8726. Integrating Science with Outreach. 1-6 Credit.**

(same as LTC 8726). This course provides an opportunity for students to earn credit for outreach activities in the community. Students will capitalize on their area of study and scientific expertise in developing, implementing, and evaluating related outreach activities. May be repeated for credit.

**BIO\_SC 8730. Advanced Community Ecology. 3 Credits.**

Detailed examination of new happenings in population and community ecology. Topics vary but will include species interactions, community structure, reproductive strategies. Prerequisites: BIO\_SC 3650 or instructor's consent.

**BIO\_SC 8740. Plant/Animal Interactions. 3 Credits.**

Discussion and lectures on herbivory, pollination biology, and dynamics of fruit and seed dispersal from ecological and evolutionary perspectives. Prerequisites: BIO\_SC 3650 or 4660 or equivalent.

**BIO\_SC 8982. Advances in Human Genetic Disorders. 1 Credit.**

Critical review of recent publications describing the molecular and cellular processes underlying genetic disorders in humans. Prerequisites: BIO\_SC 4982 or concurrent enrollment in BIO\_SC 7982. Graded on A/F basis only.

**BIO\_SC 9090. Research in Biological Sciences. 1-99 Credit.**

Research leading to dissertation. Prerequisites: graduate standing and instructor's consent. Graded on S/U basis only.

**BIO\_SC 9432. Molecular Biology II. 4 Credits.**

(same as MICROB and BIOCHM 9432. Detailed experimental analysis of eukaryotic cellular and molecular biology relevant to cellular and viral gene expression, post-transcriptional and post-translational modifications and genome replication. Models for developmental genetic analysis and genetic determinants controlling processes utilizing the current literature will be examined. Prerequisite: MICROB 9430 and graduate standing.

**BIO\_SC 9468. Molecular Biology of Plant Growth and Development. 3 Credits.**

(same as BIOCHM 9468). Molecular biology of plant hormones, signal transduction, environmental signals. Prerequisites: BIO\_SC 4976.

## **Biomedical Sciences (BIOMED)**

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**BIOMED 1010. Biomedical Career Explorations. 1 Credit.**

An introduction to the variety of career possibilities within the growing field of biomedical sciences. Graded on S/U basis only.

**BIOMED 2001. Topics in Veterinary Biomedical Science. 1-99 Credit.**

May be repeated 2 times for credit. Prerequisite: instructor's consent. Graded on A/F basis only.

**BIOMED 2085. Problems in Biomedical Research. 1-99 Credit.**

Assignment of special Topics for Research training in biomedical research. Prerequisite: instructor's consent.

**BIOMED 2110. Biomedical Terminology. 3 Credits.**

Life science etymology (Greek for "true meaning, means the study of word derivation) taught by classroom presentation and discussion. The course organization is based primarily on common themes of Greek and Latin terms along with historical reasons for current usage. The application of these terms is for all biomedical sciences and life sciences. Graded on A/F basis only.

**BIOMED 2111. Veterinary Medical Terminology. 1 Credit.**

Veterinary Medical Terminology is an extension of Biomedical Sciences [BIOMED] 2110, Biomedical Terminology. The course organization is lecture, based primarily on domestic species and common themes of Greek and Latin terms. In addition, major veterinary medical eponyms, acronyms, and medical and surgical instruments are included. Prerequisites: Biomedical Sciences [BIOMED] 2110 or instructor's consent. Graded on A/F basis only.

**BIOMED 2120. Animal Handling and Physical Restraint. 2 Credits.**

Fundamentals of handling and physical restraint of domestic large and small animals, laboratory animals, and common non-domestic pets. Graded on A/F basis only.

**BIOMED 2140. Companion Animals. 3 Credits.**

(same as Animal Science [AN\_SCI] 2140). Focus on companion dog, cat, horse owners concerns re: health, zoonoses, legal responsibilities, inbreeding, choice of breeds, behavioral problems and loss of companion animals.

**BIOMED 2210. Microbiology for the Health Sciences. 5 Credits.**

Introductory course for students in the applied health curricula. Presents biomolecules of life, enzyme interaction, physiology and structure of representative organisms. Emphasizes bacteria, viruses, fungi and protozoa of health significance. Prerequisite: Chemistry [CHEM] 1100 or equivalent and instructor's consent. Graded on A/F basis only.

**BIOMED 2230. Animal Sanitation and Disease Prevention. 3 Credits.**

Preventative measures for diseases and parasites of farm animals.

**BIOMED 2235. Domestic Animal Behavior. 3 Credits.**

An examination of the effects of domestication on the behavior of companion and food animal species. Comparisons to similar animals in feral or wild conditions will be made. The causes, development and potential treatments of abnormal behavior will also be examined. Graded on A/F basis only.

**BIOMED 2420. Biology of Healthy Living. 2 Credits.**

(same as Physical Therapy [PH\_THR] 2420 and Nutritional Sciences [NUTR\_S] 2420). Biology of inactivity as a casual factor in chronic disease.

**BIOMED 2940. Internship in Biomedical Sciences. 1-6 Credit.**

Supervised work experience to develop technical skills and enhance student knowledge in an area of biomedical science. Not intended for more than 50% independent research. Graded on S/U basis only. Prerequisites: sophomore standing and instructor's consent.

**BIOMED 3000. Specialty Careers for Veterinary Technicians. 1 Credit.**

Specialty careers for veterinary technicians are jobs which required knowledge and skills beyond those needed in primary care clinical veterinary practice. This course will explore veterinary technician specialties, the education required, and the advantages of advanced academic training. AAS degree in veterinary technology or instructors consent required. Course graded on A/F basis only.

**BIOMED 3001. Topics in Biomedical Sciences. 1-99 Credit.**

Topics in Biomedical Sciences.

**BIOMED 3085. Problems in Biomedical Science. 1-99 Credit.**

Assignment of special topics for research training in biomedical research. Prerequisite: DVM degree and instructor's consent.

**BIOMED 3100. Biomedical Pathophysiology. 3 Credits.**

Pathophysiology is the study of changes in the body resulting from disease. This course requires knowledge of normal anatomy and physiology. A comparative approach is used involving both domestic animal and human examples. Prerequisites: Animal Science [AN\_SCI] 3254 or Biological Sciences [BIO\_SC] 3700 or equivalent, AAS or equivalent degree from AVMA-accredited program or instructor's consent. Course graded on A/F basis only.

**BIOMED 3200. Comparative Hematology. 3 Credits.**

Hematology is the study of blood cells in health and disease. Emphasis in this course is placed on the changes associated with disease. Transfusion medicine and coagulation disorders will also be included. Prerequisites: Animal Science [AN\_SCI] 3254 or Biological Sciences [BIO\_SC] 3700 or equivalent, AAS or equivalent degree from AVMA-accredited program or instructor's consent. Course graded on A/F basis only.

**BIOMED 3219. Elements of Comparative Anatomy. 3 Credits.**

This course is designed to give students an introduction to and appreciation for comparative anatomy of various species encountered in animal science, veterinary technology and veterinary medicine. Detailed and labeled photos of dissected specimens are used to aid instruction. Prerequisites: five hours of biological science or zoology or equivalent or instructor's consent or an AAS degree in veterinary technology. Graded on A/F basis only.

**BIOMED 3250. Parasitology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 3250) Parasitism is considered as a fundamental type of interspecies interaction. Identifying characteristics, life cycle, and resulting disease caused by the common

parasites of domestic animals, common laboratory animals, selected wildlife, and humans are described. Special emphasis is given to parasites that can be transmitted from animals to man. Prerequisite: 8 hours of biology or instructor's consent.

**BIOMED 3300. Animal Welfare and Ethics. 3 Credits.**

An introductory examination of contemporary ethical issues related to biomedical science including animal welfare, agriculture, and cloning. Topics related to animal law issues will also be discussed. Prerequisite: junior standing.

**BIOMED 3310. Equine Health Topics. 3 Credits.**

An in-depth examination of equine disease and health topics that are pertinent to today's horse owner and veterinarian. The course will integrate horse management practices with disease recognition, control and prevention. Students will learn how to recognize problems and when to call a veterinarian. Emerging disease problems such as West Nile Virus will be examined as well as topics of continuing concern. Prerequisites: Animal Sciences [AN\_SCI] 4977 or equivalent or instructor's consent. Graded on A/F basis only.

**BIOMED 3320. Comparative Microscopic Anatomy. 3 Credits.**

The course will provide students with a background in the structure of body organs at the microscopic level. The material will emphasize structure-function relationship of cells and organs using material from diverse animal species, including human, that exemplify unique adaptations to environmental or physiological requirements. Prerequisites: Biological Sciences [BIO\_SC] 1500 or equivalent.

**BIOMED 3326. Comparative Pharmacology. 3 Credits.**

An introduction to terminology used in pharmacology. Mechanisms of drug administration, absorption, distribution, metabolism, and excretion are described. Treatment modalities in animals and humans are compared. Basics of drug actions and the medicolegal aspects of pharmacology are discussed. Prerequisite: an AAS degree in veterinary technology or Animal Science [AN\_SCI] 3254 or Biological Sciences [BIO\_SC] 3700, or equivalent, or instructor's consent.

**BIOMED 4001. Topics in Biomedical Sciences. 1-99 Credit.**

Topics in Biomedical Sciences.

**BIOMED 4010. Life Sciences Research: Models and Methods. 3 Credits.**

A review of basic laboratory animal and non-animal research models and procedures commonly used in the life sciences area in academia and drug/chemical industry. Prerequisite: Biology or Cell Biology; junior standing required. Graded on A/F basis only.

**BIOMED 4200. Veterinary Public Health and Community Practice. 3 Credits.**

Veterinary Public Health is the field of veterinary medicine that deals with food production and safety, zoonosis (animal to human) disease control, prevent and control of environmental contamination, and the role of animals in society. Prerequisites: Animal Science [AN\_SCI] 3254 or Biological Sciences [BIO\_SC] 3700 or equivalent, AAS or equivalent degree from AVMA-accredited program or instructors consent. Graded on A/F basis only.

**BIOMED 4300. Clinical Veterinary Neurology. 3 Credits.**

Clinical veterinary neurology will review the neurologic examination, common neurologic diseases and techniques to properly care for the neurologic patient. The course organization is based primarily on neuroanatomic localization of disease. Prerequisites: AAS in Veterinary

Technology or Biomedical Sciences [BIOMED] 3219 and 3100 or instructor's consent; junior or senior standing. Graded on A/F basis only.

**BIOMED 4333. Veterinary Cell Biology. 4 Credits.**

(same as Veterinary Biomedical Science [V\_BSCI] 5506). Course material stresses cell biology as related to animal health and medical issues. A comprehensive course overviewing molecular and biochemical issues of cell function especially as related to medicine and the underlying molecular causes of disease. Prerequisite: Biological Science [BIO\_SC] 1500, or equivalent, 1 course in biochemistry or 4 credit hours in chemistry; or instructor's consent.

**BIOMED 4400. Veterinary Surgical Nursing. 3 Credits.**

Veterinary Surgical Nursing will enable the student to properly identify, care for, and maintain surgical equipment. The course will also prepare the student to learn surgical anatomy as well as the potential complications of common clinical setting surgeries. Prerequisites: Biomedical Sciences [BIOMED] 2111, 3219, and 3100, or instructor's consent. Graded on A/F basis only.

**BIOMED 4500. Equine Critical Care and Nursing. 3 Credits.**

This course provides advanced information for veterinary technicians, veterinary assistants, and pre-veterinary students wishing to enhance and focus their understanding of equine critical care and nursing concepts. Prerequisites: Animal Science [AN\_SCI] 2095 and 3254 or Biological Sciences [BIO\_SC] 3700 or equivalents, AAS or equivalent degree from AVMA-accredited program or instructor's consent. Course graded on A/F basis only.

**BIOMED 4993. Internship in Veterinary Medical Technical Specialties. 1-6 Credit.**

Supervised work experience in the MU Veterinary Medical Teaching Hospital of affiliated veterinary medical specialty practices or in MU laboratory animal facilities to develop technical skills and knowledge relevant to becoming a specialist in veterinary medical technology. A written report and oral presentation are required. Graded on S/U basis only. Prerequisites: junior standing, an AAS degree from an AVMA accredited veterinary technical program or its equivalent, and instructor's consent.

**BIOMED 7010. Life Sciences Research: Models and Methods. 3 Credits.**

(same as Veterinary Biomedical Sciences [V\_BSCI] 7010). A review of basic laboratory animal and non-animal research models and procedures commonly used in the life sciences area in academia and drug/chemical industry. Prerequisite: Biology or Cell Biology; graduate standing required. Graded on A/F basis only.

**BIOMED 9090. Research - Biomedical Sciences. 1-99 Credit.**

Research hours for BMS doctoral students continuous enrollment. Graded on S/U basis only. Prerequisite: instructor's consent.

**BIOMED 9434. Gonadal Function. 3 Credits.**

(same as Animal Science [AN\_SCI] 9434). Survey of current and in-depth mechanisms involved in ovarian, testicular, and epididymal function. Emphasis will be given to comparative differences in gonadal functions among domestic animals. Prerequisites: Animal Science [AN\_SCI] 4314 or equivalent, a course in endocrinology, and biochemistry or cell biology.

## **Black Studies (BL\_STU)**

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**BL\_STU 1100. Introduction to Swahili and African Culture. 3 Credits.**

Introduction to Swahili and African Culture is a three credit hour course, which serves as a survey of an indigenous African language and the culture of East Africa. There are no prior requirements.

**BL\_STU 1250. World Theatre Workshop. 2 Credits.**

(same as Theatre [THEATR] 1250). Provides a diverse ensemble of student performers, writers, and technicians with an intensive immersion in the process of theatrical production through the public presentation of dramatic literature that focuses on global issues of ethnicity and culture.

**BL\_STU 1332. Social Perspectives on Gender, Race and Class. 3 Credits.**

(same as Women's and Gender Studies [WGST] 1332.) Examines the impact of the construction of "female" on different categories of women. Reviews women's multilayered relationships. Stresses both the roles of creator and "victim" within social structures and value systems. No credit for students who have taken Women's and Gender Studies [WGST] 1334.

**BL\_STU 1410. African American History. 3 Credits.**

(same as History [HIST] 1410). Survey of social, political and economic development to the African American people in American life from 1619 to the present.

**BL\_STU 1500. The Black Woman in America. 3 Credits.**

(same as Women's and Gender Studies [WGST] 1500). Review and critiques of a variety of materials about Black women from slavery to present. The course allows students to generate their own view about psychological, social and philosophical impact of the Black women's struggle on all women. Prerequisite: sophomore standing.

**BL\_STU 1705. Introduction to Black Studies in Culture. 3 Credits.**

Introduction to the concepts, terms, themes, and practices in the study of the African diaspora cultures, through readings in literature, music, and the arts that demonstrate concepts, terms, themes, and practices. Recommended for prospective Black Studies Majors. Program consent for repetition.

**BL\_STU 1720. African-American Theatre History. 3 Credits.**

(same as Theatre [THEATR] 1720). A historical and critical analysis of the evolution of African American cultural performance in the American theatre and entertainment industry.

**BL\_STU 1790. History of Early Africa. 3 Credits.**

(same as [HIST] 1790). This course introduces students to the early history of Africa. It focuses on political, social, economic and cultural developments based on primary and secondary sources available in print and online.

**BL\_STU 1800. The Making Modern Africa. 3 Credits.**

(same as History [HIST] 1800). This course introduces students to the recent history of Africa. It provides them with an opportunity to understand the main challenges Africans faced since colonial times based on primary and secondary sources. Prerequisite: sophomore standing or instructor's consent.

**BL\_STU 1810. History of South Africa. 3 Credits.**

(same as History [HIST]1810). South African Society from the 16th century to the present with an emphasis on the last two centuries and the consolidation of the apartheid state. Prerequisite: sophomore standing or instructor's consent.

**BL\_STU 2000. Black Studies. 3 Credits.**

An interdisciplinary introduction to the basic concepts and literature in the disciplines covered by African-American studies. The role of historical,

political, social, and economic forces in shaping cultural expression will be stressed.

**BL\_STU 2001. Undergraduate Topics in Black Studies-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. Prerequisite: program consent for repetition.

**BL\_STU 2003. Undergraduate Topics in Black Studies-Behavioral Science. 3 Credits.**

Organized study of selected topics. Subjects, specific content, and credits may vary from semester to semester. Repeatable up to 6 hours with program consent.

**BL\_STU 2005. Topics in Black Studies - Humanities. 3 Credits.**

Organized study of selected topics focusing on Black history and culture. Specific content may vary from semester to semester and will be announced in advance.

**BL\_STU 2150. African-American Cinema. 3 Credits.**

(same as Theatre [THEATR] 2150). Study of the impact of cinema and the entertainment industry on the social perceptions of African-Americans and on African-American culture.

**BL\_STU 2200. Social Inequalities. 3 Credits.**

(Same as Sociology [SOCIO] 2200.) Survey of inequalities based upon criteria such as race, ethnicity, sex, age, religion and social class in contemporary societies. Focus on dynamics by which privilege and inequality are structured. Prerequisite: sophomore standing or instructor's consent.

**BL\_STU 2210. The Black Americans. 3 Credits.**

(same as Sociology [SOCIO] 2210.) Analysis of history of blacks in the United States. Assessment of contemporary black community in terms of its institutions, style of life, patterns of work and intergroup relations. Prerequisites: Sociology [SOCIO] 1000 or equivalent or instructor's consent.

**BL\_STU 2310. Literature of the African Diaspora. 3 Credits.**

(Same as Romance Languages [RM\_LAN] 2310) A postcolonial analysis of selected literary texts interpreting the African diaspora in the Americas.

**BL\_STU 2400. Introduction to African Diaspora Literature. 3 Credits.**

(same as English [ENGLSH] 2400). Introduces students to African Diaspora literature with an emphasis on literature written originally in English. Prerequisite: English [ENGLSH] 1000. No more than six hours may be taken in the Introduction to African Diaspora Literature series.

**BL\_STU 2407. Introduction to African Diaspora Literature, 1603-17. 3 Credits.**

(same as English [ENGLSH] 2407). See Black Studies [BL\_STU] 2400 for course description.

**BL\_STU 2408. Introduction to African Diaspora Literature, 1789-1890. 3 Credits.**

(same as English [ENGLSH] 2408). See Black Studies [BL\_STU] 2400 for course description.

**BL\_STU 2409. Introduction to African Diaspora Literature, 1890-Present. 3 Credits.**

(same as English [ENGLSH] 2409). See Black Studies [BL\_STU] 2400 for course description.

**BL\_STU 2410. African American Women in History. 3 Credits.**

(same as History [HIST] and Women's and Gender Studies [WGST] 2410). African American Women in history is a topics course covering



major issues affecting black women since their introduction into english-speaking North America to the present.

**BL\_STU 2450. Themes in the Geography of Africa South of the Sahara. 3 Credits.**

(same as Geography [GEOG] 2450). Major concepts of African geography in current and historical perspective. Case studies of major African countries. Prerequisites: sophomore standing or one introductory Geography course.

**BL\_STU 2500. Special Problems in Black Studies. 1-99 Credit.**

Research apprenticeship with faculty member, assisting a faculty member in the development and execution of a research project. May be repeated for a maximum of six hours. Prerequisite: sophomore standing, instructor's consent.

**BL\_STU 2501. Undergraduate Topics in Black Studies. 1-3 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester. Prerequisite: program consent for repetition; sophomore standing.

**BL\_STU 2570. Black Religion. 3 Credits.**

A history of religion approach to the study of black religion which takes into consideration the unique past experiences of the African American community as it underwent the terror of forced migration, slavery, segregation, and discrimination. Prerequisite: sophomore standing.

**BL\_STU 2610. Islam and Black America. 3 Credits.**

A historical survey of the origins, development and impact of the Black Islamic tradition.

**BL\_STU 2715. Studies in Black Culture. 3 Credits.**

This course will survey selected forms of black cultural expression, from a range of U.S., Africa, and the African Diaspora cultures in various media including literature, music, film studies, as well as other related disciplines. Program consent for repetition.

**BL\_STU 2720. African-American Visual Culture. 3 Credits.**

(Same as Art History and Archaeology [AR\_H\_A] 2720) This course introduces students to African-American art history, visual culture, and material culture in their cultural, political, and historical contexts. Specific focuses may include the Harlem Renaissance, the Black Arts Movement, and other topics.

**BL\_STU 2904. Black Studies in Slavery and Freedom. 3 Credits.**

This course provides study of historical background, economic, political, and social implications of slavery and freedom in the African Diaspora (Americas, Africa, Europe, Asia) as well as the legal and extralegal struggles for and meaning of (global, local, and national) freedom.

**BL\_STU 2975. Theoretical Traditions in Blacks Studies - Culture. 3 Credits.**

This course provides a broad understanding of the diverse theoretical traditions within the field of Black Studies, through a comparative examination of concepts, developments, and debates in humanities, including literature, languages, and music. Course graded on A/F basis only.

**BL\_STU 3001. Undergraduate Topics in Black Studies - General. 3 Credits.**

Organized study of selected topics. Subjects, specific content, and credits may vary from semester to semester. Repeatable up to 6 hours with program consent. Prerequisite: Junior standing and/or Black Studies [BL\_STU] 2000.

**BL\_STU 3003. Undergraduate Topics in Black Studies - Behavioral Sciences. 1-3 Credit.**

Organized study of selected topics focusing on Black history, culture, or other relevant disciplines. Subjects, specific content, and credits may vary from semester to semester. Repeatable up to 6 hours with program consent. Prerequisites: Junior standing and/or Black Studies [BL\_STU] 2000.

**BL\_STU 3004. Undergraduate Topics in Black Studies - Social Science. 1-3 Credit.**

Organized study of selected topics focusing on Black history, culture, or other relevant disciplines. Subjects, specific content, and credits may vary from semester to semester. Repeatable up to 6 hours with program consent. Prerequisites: Junior standing and/or Black Studies [BL\_STU] 2000.

**BL\_STU 3005. Undergraduate Topics in Black Studies - Humanities. 3 Credits.**

Organized study of selected topics focusing on Black history, culture, or other relevant disciplines. Subjects, specific content, and credits may vary from semester to semester. Repeatable up to six credit hours with program consent. Prerequisites: Junior Standing and/or Black Studies [BL\_STU] 2000.

**BL\_STU 3100. African American Psychology. 3 Credits.**

(same as Educational, School and Counseling Psychology [ESC\_PS] 3100 and Psychology [PSYCH] 3880). The research, theories, and paradigms developed to understand the attitudes, behaviors, and psychosocial realities of African-Americans are discussed. Prerequisite: Psychology [PSYCH] 1000.

**BL\_STU 3200. Black Freedom Movement, 1955-1973. 3 Credits.**

(same as History [HIST] 3200). Examines the dismantling of American apartheid and its transformation into a new racial control system. It also explores how and why the Civil Rights Movement was converted into a struggle for Black Power.

**BL\_STU 3230. Studies in Black Sexual Politics. 3 Credits.**

Course explores Black transnational politics of sex/sexuality and examines the theoretical, historical, and socio-cultural context that race, gender, and sexuality are used as analytical concepts. Students learn a transdisciplinary approach and apply this newly acquired information to analyze shifts in the field of Black sexuality studies. Prerequisite: sophomore standing required. May be repeated for credit.

**BL\_STU 3400. Survey of African American Literature, Beginnings to 1900. 3 Credits.**

(same as English [ENGLSH] 3400). A survey of major authors and movements in African American literature from its beginnings to 1900. Prerequisite: English [ENGLSH] 1000.

**BL\_STU 3410. Survey of African American Literature, 1900-Present. 3 Credits.**

(same as English [ENGLSH] 3410). A survey of major authors and movements in African American literature from 1900 to the present. Prerequisite: English [ENGLSH] 1000.

**BL\_STU 3420. Periods and Genres in African Diaspora Literature. 3 Credits.**

(same as English [ENGLSH] 3420). Topic (e.g. Harlem Renaissance, African Diaspora Poetry) Announced at time of registration. Prerequisite: English [ENGLSH] 1000. No more than 6 hours may be taken in the Periods and Genres in African Diaspora Literature series.

**BL\_STU 3427. Periods and Genres in African Diaspora Literature, 1603-1789. 3 Credits.**

(same as English [ENGLSH] 3247). See Black Studies [BL\_STU] 3420 for course description.

**BL\_STU 3428. Periods and Genres in African Diaspora Literature, 1789-1890. 3 Credits.**

(same as English [ENGLSH] 3248). See Black Studies [BL\_STU] 3420 for course description.

**BL\_STU 3429. Periods and Genres in African Diaspora Literature, 1890-Present. 3 Credits.**

(same as English [ENGLSH] 3249). See Black Studies [BL\_STU] 3420 for course description.

**BL\_STU 3590. Religious Biography: Black Religion. 3 Credits.**

(same as History [HIST] 3400). Studies black American religion through the biographies of representative and influential figures of the nineteenth and twentieth centuries, including Nat Turner, W.E.B Dubois, Marcus Garvey, M.L. King, and Malcolm X.

**BL\_STU 3624. Comparative Approaches to Black Studies in History. 3 Credits.**

(same as HIST 3624). Comparative approach to the study of Black Diaspora history that focuses on the theory, method, structure, and application of modes of cultural production within the history of Black Diaspora cultures. Recommended for students with an interest in Black Studies or majors in the Humanities field. Program consent for repetition.

**BL\_STU 3625. Comparative Approaches to Black Studies in Culture. 3 Credits.**

Comparative approach to the study of Black Diaspora cultures that focus on the theory, method, structure, and application of modes of cultural production within Black Diaspora cultures. Recommended for students with an interest in Black Studies or majors in the Humanities field. Course may be repeated for credit with consent of program.

**BL\_STU 3670. History of Black Nationalism in the United States. 3 Credits.**

(same as History [HIST] 3410). Examines the struggle of African Americans to construct autonomous institutions, to build all Black communities or to acquire an independent nation-state. We will study the ideology, structure, strategy and tactics. Prerequisites: History [HIST] 1410 or Sociology [SOCIOL] 2210.

**BL\_STU 3703. Themes in Black Society. 3 Credits.**

Examines various themes, issues, and perspectives in political science, psychology, sociology, and other related disciplines related to social and historical institutions in the U.S., Africa, and the African Diaspora. Recommended for Black Studies or Behavioral Science Majors. Program consent for repetition.

**BL\_STU 3705. Themes in Black Culture. 3 Credits.**

Examines various themes, issues and perspective in literature, music, the arts, and other related disciplines related to social and historical institutions in the U.S., Africa, and the African Diaspora. Recommended for Black Studies Majors. Program consent required for repetition.

**BL\_STU 3800. Women in African History. 3 Credits.**

(same as History [HIST] 3800). Focuses on the varied and changing roles of women in sub-Saharan Africa from pre-colonial times to the present. Prerequisite: sophomore standing or instructor's consent.

**BL\_STU 3850. Gender, Hip Hop, and the Politics of Representation. 3 Credits.**

This class will examine gender in hip hop while exploring the intra- and interracial politics of representation among those of the hip hop generation.

**BL\_STU 3977. Black Studies Methodologies. 3 Credits.**

Advanced research, writing, and application of knowledge and critical paradigms in Black Studies, through study of such topics as slavery, colonialism, urbanization and migration, environment, gender, race, identity, intellectual movements, cultural studies and popular culture. Prerequisites: Black Studies [BL\_STU] 2977. Graded on A/F basis only.

**BL\_STU 4000. Special Problems in Black Studies. 1-99 Credit.**

Independent investigation leading to a paper or a project. Prerequisite: junior standing, instructor's consent.

**BL\_STU 4001. Undergraduate Topics in Black Studies-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester. Prerequisite: program consent for repetition. Prerequisite: junior standing.

**BL\_STU 4040. Houses Divided: Society and Politics in the Civil War Era. 3 Credits.**

(Same as History [HIST] 4040) Examines the sectional crisis, the Civil War and reconstruction through the lens of divided households. Considers the experience of soldiers and civilians, women and men, slaves and freedpeople.

**BL\_STU 4130. African-American Politics. 3 Credits.**

(same as Political Science [POL\_SC] 4130). Surveys political participation of African-Americans in American politics. Analyzes their public lives in the context of elections, behavior of political organizations, social movements, parties, and level of government. Prerequisites: Political Science [POL\_SC] 1100 and junior standing.

**BL\_STU 4181. Themes in Literature by Women. 3 Credits.**

(same as Women's and Gender Studies [WGST] and English [ENGLSH] 4181). Examines works by a number of women writers with particular attention to their sociopolitical context. May repeat to six hours with department's consent. Prerequisite: junior standing.

**BL\_STU 4210. African-American Religion. 3 Credits.**

(same as Religious Studies [REL\_ST] 4210). Examines the organization of major African American Christian denominations, Islam and religious movements. Twentieth century issues will be discussed, including sexism, classism and homophobia in church communities. Prerequisite: junior standing or instructor's consent.

**BL\_STU 4220. Religion in Afro-American Literature. 3 Credits.**

(same as Religious Studies [REL\_ST] 4220). Examination of Afro-American fiction, poetry and drama which present significant racial attitudes toward the Christian religion. Prerequisites: sophomore standing.

**BL\_STU 4230. Women, Development, and Globalization. 3 Credits.**

(same as Sociology [SOCIOL] 4230 and Women's and Gender Studies [WGST] 4230 and Peace Studies [PEA\_ST] 4230). Examines the history and structure of "development" discourse and practices. Stresses the interconnections and impact on women globally. Reviews women's strategies in defining and instituting programs to improve quality of life in communities. Prerequisites: BL\_STU 1332, 2200; SOCIOL 2200, WGST 1332 or 2010.

**BL\_STU 4270. African-Americans in the Twentieth Century. 3 Credits.**

(same as History [HIST] 4270). Surveys the African-American experience from 1900 to the present. Attention is given to economic, political, social, and cultural trends.

**BL\_STU 4300. The Black Family: Past, Present & Future. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 4300). Emphasis is on the unique social, economic, religious, educational and political environments that have affected the structure and function of the black family. Prerequisite: junior standing.

**BL\_STU 4360. Working with Minority Youth. 3 Credits.**

(same as Social Work [SOC\_WK] 4360). Develops awareness and understanding of social/psychological/ cognitive realities influencing the behavior of black youth. Content draws upon theories, research, and practice skills relevant to understanding black youth. Minority groups included. Prerequisite: junior standing or instructor's consent.

**BL\_STU 4380. Social Work Practice With Minorities: African-American Emphasis. 3 Credits.**

(same as Social Work [SOC\_WK] 4380). Provides students with an appreciation of the black experience in the United States on a knowledge and feeling level.

**BL\_STU 4400. Studies in African Diaspora Literature. 3 Credits.**

(same as English [ENGLSH] 4400). Topics (e.g., African American Poetry, African Diaspora Drama) announced at time of registration. No more than six hours may be taken in the Studies in African Diaspora Literature series. Prerequisite: junior standing.

**BL\_STU 4407. Studies in African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as English [ENGLSH] 4407). See Black Studies [BL\_STU] 4400 for course description.

**BL\_STU 4408. Studies in African Diaspora Literature, 1789 to 1890. 3 Credits.**

(same as English [ENGLSH] 4408). See Black Studies [BL\_STU] 4400 for course description.

**BL\_STU 4409. Studies in African Diaspora Literature, 1890 to Present. 3 Credits.**

(same as English [ENGLSH] 4409). See Black Studies [BL\_STU] 4400 for course description.

**BL\_STU 4410. Major Africana Diaspora Writers. 3 Credits.**

(same as English [ENGLSH] 4410). An intensive study of selected writers of African Diaspora literature focusing on texts original in English. No more than six hours may be taken in the Major African Diaspora Writers series. Prerequisite: junior standing or instructor's consent.

**BL\_STU 4415. African Americans and American Justice. 3 Credits.**

(same as History [HIST] 4415) This course provides opportunities to review and discuss selected court cases and legislation in which black men, women, or children were plaintiffs and defendants or affected by the laws. Prerequisite: senior standing required.

**BL\_STU 4417. Major African Diaspora Writers, 1603 to 1789. 3 Credits.**

(same as English [ENGLSH] 4417). See Black Studies [BL\_STU] 4410 for course description.

**BL\_STU 4418. Major African Diaspora Writers, 1789 to 1890. 3 Credits.**

(same as English [ENGLSH] 4418). See Black Studies [BL\_STU] 4410 for course description.

**BL\_STU 4419. Major African Diaspora Writers, 1890-Present. 3 Credits.**

(same as English [ENGLSH] 4419). See Black Studies [BL\_STU] 4410 for course description.

**BL\_STU 4420. Africana Womanism. 3 Credits.**

(same as English [ENGLSH] 4420). An intensive study of Africana Womanism, focusing on selected Africana women writers. Prerequisites: junior standing or instructor's consent. May be repeated to six hours with departmental consent.

**BL\_STU 4460. Economic Characteristics of the African American Experience. 1 Credit.**

(same as History [HIST] 4460). Examines how economic considerations have influenced African American history from the transAtlantic slave trade to the present. Prerequisite: junior standing or instructor's consent.

**BL\_STU 4480. Major African Diaspora Women Writers. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4480 and English [ENGLSH] 4480). Study of selected Africana Diaspora women writers, focusing on texts originally in English. Repeatable with department's consent. Maximum of 6 hours for Black Studies [BL\_STU] 4180 and 4480.

**BL\_STU 4487. Major African Diaspora Women Writers, 1603 to 1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4487 and English [ENGLSH] 4487). See Black Studies [BL\_STU] 4480 for course description.

**BL\_STU 4488. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4488 and English [ENGLSH] 4488). See Black Studies [BL\_STU] 4480 for course description.

**BL\_STU 4489. Major African Diaspora Women Writers, 1890 to Present. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4489 and English [ENGLSH] 4489). See Black Studies [BL\_STU] 4480 for course description.

**BL\_STU 4500. Special Problems in Black Studies. 1-99 Credit.**

Independent project or paper, not leading to dissertation. Prerequisite: program's approval.

**BL\_STU 4530. Caribbean Women Writers. 3 Credits.**

Examines representative works by female authors from the Caribbean; primarily the English speaking islands. The depiction of Caribbean women will be a major consideration, as well as the unique qualities of Caribbean literature. Prerequisite: sophomore standing or instructor's consent.

**BL\_STU 4640. African Politics. 3 Credits.**

(same as Political Science [POL\_SC] 4640). A general comparative course focusing on post-independent Africa. Theories and concepts related to decolonization, nationalism, democratization, and ethnicity; also institutional forms and organizations: political parties, parliaments, and executives. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**BL\_STU 4700. Race, Gender and Ethnicity in Higher Education. 3 Credits.**

Historical relationships of race, gender, and ethnic issues in United States higher education. Issues include: theory and research of curriculum and teaching, diversity within the academy, and leadership, governance, and policy.

**BL\_STU 4710. Themes in African Diaspora Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 4160 and English [ENGLSH] 4710.) Intensive study in a selected area of African Diaspora Folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature, or the folklore of a particular group. 4710 may be repeated for a maximum of six hours with instructor's consent. Prerequisite: junior standing.

**BL\_STU 4720. Third World Politics. 3 Credits.**

(same as Political Science [POL\_SC] 4720). Comparative, interdisciplinary analysis of the politics of selected states in Southeast Asia, Africa, and Latin America. Special attention given to the problems of political and socioeconomic development. Prerequisites: junior standing or instructor's consent.

**BL\_STU 4877. Black Studies Abroad. 3 Credits.**

This interdisciplinary study abroad course provides students with global experience within the African Diaspora, the opportunity to study in a foreign culture and augment their "global competencies" and course of study across the three Black Studies tracks-History, Culture and Society-as well as support their study and/or career development. Graded A-F basis only.

**BL\_STU 4972. Undergrad. Seminar in Black Studies: History of Race in the U.S.. 3 Credits.**

Readings on problems in American history with reports and discussion on selected topics. Prerequisite: junior standing, fifteen hours or instructor's consent. Departmental consent for repetition up to a maximum of 6 hours.

**BL\_STU 4977. Black Studies Capstone. 3 Credits.**

This course is designed to permit students to integrate general and specialized knowledge within the three Black Studies tracks (History, Society, Culture) using an interdisciplinary approach. Topics vary according to instructor and core discipline. Prerequisite: Black Studies [BL\_STU] 2977 and 3977; instructor's consent. Graded on A/F basis only.

**BL\_STU 7004. Topics in Black Studies. 1-99 Credit.**

Organized study of selected topics in Black Studies. Subjects and earnable credit may vary from semester to semester. Prerequisite: instructor's consent. Graded on A/F basis only.

**BL\_STU 7270. African-Americans in the Twentieth Century. 3 Credits.**

(same as History [HIST]7270). Surveys the African-American experience from 1900 to the present. Attention is given to economic, political, social, and cultural trends.

**BL\_STU 7300. The Black Family: Past, Present & Future. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 7300). Emphasis is on the unique social, economic, religious, educational and political environments that have affected the structure and function of the black family. Prerequisite: graduate standing.

**BL\_STU 7400. Studies in African Diaspora Literature. 3 Credits.**

(same as English [ENGLSH] 7400). Topics (e.g., African American Poetry, African Diaspora Drama) announced at time of registration. No more than six hours may be taken in the Studies in African Diaspora Literature series. Prerequisite: graduate standing.

**BL\_STU 7407. Studies in African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as English [ENGLSH] 7407). See Black Studies [BL\_STU] 7400 for course description. Graduate standing required.

**BL\_STU 7408. Studies in African Diaspora Literature, 1789 to 1890. 3 Credits.**

(same as English [ENGLSH] 7408). See Black Studies [BL\_STU] 7400 for course description.

**BL\_STU 7409. Studies in African Diaspora Literature, 1890 to Present. 3 Credits.**

(same as English [ENGLSH] 7409). See Black Studies [BL\_STU] 7400 for course description.

**BL\_STU 7410. Major Africana Diaspora Writers. 3 Credits.**

(same as English [ENGLSH] 7410). An intensive study of selected writers of African Diaspora literature focusing on texts originally in English. No more than six hours may be taken in the Major Anglophone African Diaspora Writers series. Prerequisite: graduate standing or instructor's consent.

**BL\_STU 7415. African Americans and American Justice. 3 Credits.**

(same as History [HIST] 7415) This course provides opportunities to examine the judicial system and discuss selected court cases in which black men, women, or children were plaintiffs or defendants in local and national courts. Moreover, the readings will subject conventional wisdom about black Americans and the legal system to scrutiny while allowing students to "witness" the mechanics of the courts and to assess long and short range social, economic, and political implications for Americans, black and white. Graduate standing required.

**BL\_STU 7417. Major African Diaspora Writers, 1603 to 1789. 3 Credits.**

(same as English [ENGLSH] 7417). See Black Studies [BL\_STU] 7410 for course description.

**BL\_STU 7418. Major Anglophone African Diaspora, 1789 to 1890. 3 Credits.**

(same as English [ENGLSH] 7418). See Black Studies [BL\_STU] 7410 for course description.

**BL\_STU 7419. Major African Diaspora Writers, 1890 to Present. 3 Credits.**

(same as English [ENGLSH]7419). See Black Studies [BL\_STU] 7410 for course description.

**BL\_STU 7420. Africana Womanism. 3 Credits.**

(same as English [ENGLSH] 7420). An intensive study of Africana Womanism, focusing on selected Africana women writers. Prerequisites: graduate standing or instructor's consent. May be repeated to six hours with departmental consent.

**BL\_STU 7460. Economic Characteristics of the African American Experience. 1 Credit.**

(same as History [HIST] 4460). Examines how economic considerations have influenced African American history from the transatlantic slave trade to the present. Prerequisite: junior standing or instructor's consent.

**BL\_STU 7480. Major African Diaspora Women Writers. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7480 and English [ENGLSH] 7480). Study of selected African Diaspora women writers, focusing on texts originally in English. May be repeated for credit with departmental consent. Maximum of 6 hours for Black Studies [BL\_STU] 7180 and 7480.

**BL\_STU 7487. Major African Diaspora Women Writers, 1603 to 1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7487 and English [ENGLSH] 7487). See Black Studies [BL\_STU] 7480 for course description.

**BL\_STU 7488. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7488 and English [ENGLSH] 7488). See Black Studies [BL\_STU] 7480 for course description.

**BL\_STU 7489. Major African Diaspora Women Writers, 1890 to Present. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7488 and English [ENGLSH] 7488). See Black Studies [BL\_STU] 7480 for course description.

**BL\_STU 7710. Themes in African Diaspora Folklore. 3 Credits.**

(same as Anthropology [ANTRHO] 7160 and English [ENGLSH] 7710.) Intensive study in a selected area of African Diaspora Folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature, or the folklore of a particular group. English [ENGLSH] 7700 and 7710 may be repeated for a maximum of six hours with instructor's consent. Prerequisite: graduate standing.

**BL\_STU 7810. African-American Religion. 3 Credits.**

(same as Religious Studies [REL\_ST] 7810). Examines the organization of major African American Christian denominations, Islam and religious movements. Twentieth century issues will be discussed, including sexism, classism and homophobia in church communities. Prerequisite: graduate standing or instructor's consent.

**BL\_STU 7877. Black Studies Abroad. 3 Credits.**

This interdisciplinary study abroad course provides students with global experience within the African Diaspora, the opportunity to study in a foreign culture and augment their "global competencies" and course of study across the three Black Studies tracks - History, Culture, and Society - as well support their study and/or career development. Graded on A-F basis only.

**BL\_STU 8000. Independent Readings in Black Studies. 3 Credits.**

Readings on selected topics in Black Studies, with emphasis on the implications of the interdisciplinary and intersecting areas of History, Society, and Culture. May be repeated to a maximum of six hours. Department Consent Required. Graduate standing required.

**BL\_STU 8277. Race, Ethnicity, and Transnational Inequalities. 3 Credits.**

(same as Sociology [SOCIO] 8277). This graduate seminar examines the global contest of our radicalized modern world system. How do people develop and give meaning to race/ethnicity in different regions? Focus on the construction of bodies Creole identities, gender, sexualities, citizenships and immigration. Restricted to graduate students only. Graded on A/F basis only.

**BL\_STU 8400. Seminar in African Diaspora Literature. 3 Credits.**

(same as English [ENGLSH] 8400). Topic (e.g., Autobiography, Black Women Writers) announced at time of registration. May be repeated to 12 hours with departmental consent.

**BL\_STU 8410. Seminar in African Diaspora Theory and Literature Criticism. 3 Credits.**

(same as English [ENGLSH] 8410). Modern and contemporary African Diaspora criticism and theory including diverse approaches to literary and

cultural studies. May be repeated to 12 hours with departmental consent. Prerequisite: graduate standing.

**BL\_STU 8415. Readings in African-American History. 3 Credits.**

(Same as History [HIST] 8415). Readings on selected topics in African-American history from 1619 to the present, with emphasis on conflicting interpretations. May be repeated to a maximum of six hours.

**BL\_STU 8416. Seminar in African-American History. 3 Credits.**

(same as History [HIST] 8416). Directed research in selected topics in African-American history. May be repeated to a maximum of six hours.

**BL\_STU 8901. Graduate Topics in Black Studies. 3 Credits.**

Graduate seminar arranged by topics or themes related to Black Studies. Graded on A/F basis only. Graduate standing required.

## **Business Administration (BUS\_AD)**

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**BUS\_AD 3500. Professional Development in Business. 3 Credits.**

Provides an introduction to professional competencies important for success as a business professional. Includes the assessment, communication and development of competencies valued by employers. Prerequisite: Upper level in the TCoB.

**BUS\_AD 4500. Professional Development Program - Practicum. 3 Credits.**

This course is designed to help students practice professional core competencies in the workplace. Students will secure a professional-level work experience and apply classroom knowledge and interpersonal skills. This course is a graduation requirement for students seeking the BSBA degree. Prerequisite: Business Administration [BUS AD] 3500. Graded on S/U basis only.

**BUS\_AD 7050. MBA Communications Practice. 1-3 Credit.**

Special laboratory instruction in oral and written communication skills with an emphasis on business. communications. Prerequisites: graduate standing.

**BUS\_AD 7330. Business Law/Regulation. 2-3 Credit.**

Legal aspects of employment, administrative regulation, corporate and noncorporate ownership structures, and legal issues involving business transactions. Prerequisite: graduate standing.

**BUS\_AD 7340. Organizational Ethics. 1-3 Credit.**

Case studies, discussion, and readings used to integrate critical thinking about ethical issues into business decision. Development and application of ethical decision making frameworks. Prerequisite: graduate standing.

**BUS\_AD 8001. Topics in Business Administration. 1-99 Credit.**

Selected topics in administration offered on experimental basis. Prerequisites: graduate standing and instructor's consent.

**BUS\_AD 8010. MBA Seminar. 1-3 Credit.**

Integration of business executives and real world problem solving, career preparation, and professional growth activities. Assignments emphasize teamwork and group productivity. Prerequisites: MBA students only. May be repeated.

**BUS\_AD 8020. MBA Seminar. 1-3 Credit.**

Integration of business executives and real world problem solving, career preparation, and professional growth activities. Assignments emphasize teamwork and group productivity. Prerequisites: MBA students only. May be repeated.

**BUS\_AD 8030. MBA Seminar. 1-3 Credit.**

Integration of business executives and real world problem solving, career preparation, and professional growth activities. Assignments emphasize teamwork and group productivity. Prerequisites: MBA students only. May be repeated. Some sections may be graded A/F or S/U only.

**BUS\_AD 8500. Business Problem Analysis: Field Project. 1-3 Credit.**

Application of functional areas of business to real-world cases in business planning. Students will prepare and present business plan for an organization as a team project in a supervised experience. Prerequisite: graduate standing.

**BUS\_AD 8600. Business Consulting. 2-3 Credit.**

Students work in a team consulting capacity, with medium to large organizations, identifying and defining relatively complex and often ambiguous business problems such as needs assessment, quality management, systems management, policy/strategy formulation and similar areas.

**BUS\_AD 8730. International Study Abroad. 3-6 Credit.**

Study abroad opportunities in one or more countries. Focuses on selected international business issues, cultural differences, and visiting businesses on-site. Graded on a S/U basis only. Prerequisites: graduate standing; consent required. May be repeated as venues change.

## Cardiopulmonary & Diagnostic Sciences (CPD)

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**CPD 2190. Medical Terminology. 3 Credits.**

Medical terminology based on a word building system. This course is intended for students majoring in health professions, nursing and other helping professions, pre-med and biology. Prerequisite: sophomore standing.

**CPD 3200. Essentials of Pathology. 2 Credits.**

Provides basic foundation for understanding etiology of disease with emphasis on systemic pathology for non-medical students. Prerequisites: general biology and one course in either physiology or anatomy.

**CPD 3460. Cardiovascular and Pulmonary Diagnostic Applications I. 3 Credits.**

(same as Radiologic Sciences [RA\_SCI] 3460). Interdisciplinary small group, case-based study of common cardiovascular, pulmonary and other diseases. Pathophysiology, diagnosis and treatment from the perspective of allied health professionals. Emphasis on critical thinking, teamwork skills. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program.

**CPD 4440. Organization and Administration. 3 Credits.**

(same as Radiologic Science [RA\_SCI] 4440 and Respiratory Therapy [RS\_THR] 4440). Examines design and operation of allied health service departments and educational programs, including facilities, personnel procedures, record systems, ethics, medical-legal aspects, interdepartmental relations and curriculum development.

**CPD 4460. Cardiovascular and Pulmonary Diagnostic Applications II. 3 Credits.**

(same as Radiologic Sciences [RA\_SCI] 4460). Interdisciplinary study of cardiac dysrhythmias, MI, stroke. Application of current American Heart Association Advanced Cardiac Life Support (AHA ACLS) algorithms. Successful completion of this course fulfills AHA ACLS Provider requirements.

**CPD 4480. Clinical Ethics. 3 Credits.**

(same as Health Professions [HTH\_PR] 4480) Analysis of clinical situations per ethical principles and decision-making models. Examination of fundamental doctrines and principles for legal and ethical clinical practice and policy. Prerequisites: instructor's consent.

**CPD 4500. Bioterrorism in Healthcare. 1 Credit.**

This course will provide the student with an orientation the principles of disaster management in the community (both state and federal levels) and the acute care facility. Topics include biological agents, allocation of resources and ethical considerations.

**CPD 4840. Asthma Education. 2 Credits.**

This course will provide the student with a multi-faceted approach to caring for the patient with asthma. Topics include pathophysiology, pharmacology, patient/family education, patient assessment and management. Assists students to take the Asthma Educator Credentialing Exam. Instructor's consent. Graded on A/F basis only.

**CPD 4955. Introduction to Research. 3 Credits.**

(same as Respiratory Therapy [RS\_THR] 4955). An interdisciplinary course designed to promote undergraduate allied health research. Includes identifying and designing research problems through formulating relevant questions, learning to systematically search for answers, and methods for searching the literature.

**CPD 4985. Healthcare Organization and Leadership. 3 Credits.**

(same as Health Professions [HTH\_PR] 4985). In this course, students will explore leadership principles as they relate to the student's focus area, combining previous expertise in the field with an interdisciplinary perspective within the healthcare community. Graded on A/F basis only. Prerequisite: Health Professions [HTH\_PR] 2100.

**CPD 7840. Asthma Education. 2 Credits.**

This course will provide the student with a multi-faceted approach to caring for the patient with asthma. Topics include pathophysiology, pharmacology, patient/family education, patient assessment and management. Assists students to take the Asthma Educator Credentialing Exam. Instructor's consent required. Graded on A/F basis only.

## Chemical Engineering (CH\_ENG)

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**CH\_ENG 1000. Introduction to Chemical Engineering. 2 Credits.**

Orientation course for freshmen-level students. Introduction to careers and opportunities in chemical engineering, basic engineering principles, simple calculations. Prerequisites: Mathematics [MATH] 1500, Chemistry [CHEM] 1320, or concurrently.

**CH\_ENG 1000H. Introduction to Chemical Engineering - Honors. 2 Credits.**

Orientation course for freshmen-level students. Introduction to careers and opportunities in chemical engineering, basic engineering principles, simple calculations. Prerequisites: Mathematics [MATH] 1500, Chemistry [CHEM] 1320, or concurrently. Honors eligibility required.

**CH\_ENG 1320. Chemistry and Chemical Technology I. 3 Credits.**

Covers fundamental principals of chemistry, gases, engineering materials, electrochemistry, and applications with instruction including numerical modeling. May be repeated for credit. Prerequisite: Mathematics [MATH] 1500 or concurrent enrollment. Graded on A/F basis only.

**CH\_ENG 1330. Chemistry and Chemical Technology II. 3 Credits.**

Covers fundamentals principals of chemistry, gases, engineering materials, electrochemistry, and applications with instruction including numerical modeling. May be repeated for credit. Prerequisite: Chemical Engineering [CH\_ENG] 1320 or Chemistry [CHEM] 1320 and Mathematics [MATH] 1500. Corequisite: Mathematics [MATH] 1500. Graded on A/F basis only.

**CH\_ENG 2001. Advanced Experimental Course. 1-99.9 Credit.**

Content and number of credit hours to be listed in Schedule of Courses. Prerequisite: sophomore standing.

**CH\_ENG 2118. Introduction to Energy Technology and Sustainability. 3 Credits.**

An introductory course on energy technology and those resources and practices that allow for sustainable commercialization. Prerequisite: sophomore standing in engineering. Graded on A/F basis only.

**CH\_ENG 2225. Mass and Energy Balance. 3 Credits.**

Industrial stoichiometry, material and energy balances, thermophysics, thermochemistry; related topics. Prerequisites: Physics [PHYSICS] 2750 , Chemistry [CHEM] 2100, or concurrently.

**CH\_ENG 2226. Engineering Process Computations and Laboratory. 3 Credits.**

Engineering applications of ordinary and partial differential equations, spreadsheets, Matlab, discipline-specific software (Aspen), process simulation, data collection, data regression, and modeling of multiple experimental systems. Pre or Co - requisite: Mathematics [MATH] 1700.

**CH\_ENG 3234. Principles of Chemical Engineering I. 3 Credits.**

Fluid flow, heat transfer. Prerequisites: grade of C or better in Chemical Engineering [CH\_ENG] 2225.

**CH\_ENG 3235. Principles of Chemical Engineering II. 3 Credits.**

Mass transfer. Prerequisite: Chemical Engineering [CH\_ENG] 3234.

**CH\_ENG 3243. Chemical Engineering Laboratory I. 3 Credits.**

Laboratory study of some principal unit operations of chemical engineering. Prerequisite or Co-Requisite: Chemical Engineering [CH\_ENG] 2226 and 3235.

**CH\_ENG 3261. Chemical Engineering Thermodynamics I. 3 Credits.**

Study of thermodynamics, with particular reference to chemical engineering applications. Prerequisites: grade of C or better in Chemical Engineering [CH\_ENG] 2225.

**CH\_ENG 3262. Chemical Engineering Thermodynamics II. 3 Credits.**

Prerequisite: Chemical Engineering [CH\_ENG] 3261.

**CH\_ENG 3307. Chemical Process Safety and Professional Ethics. 3 Credits.**

A course focused on important technical fundamentals of chemical process safety and their application including professional ethics considerations. Prerequisite: Chemical Engineering [CH\_ENG] 3234, 3261 or instructor's consent. Graded on A/F basis only.

**CH\_ENG 4001. Topics in Chemical Engineering. 3 Credits.**

Current and new technical developments in chemical engineering. Prerequisite: instructor's consent.

**CH\_ENG 4085. Problems in Chemical Engineering. 2-4 Credit.**

Directed study of chemical engineering problems. Prerequisite: instructor's consent.

**CH\_ENG 4220. Hazardous Waste Management. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4220). Engineering principles involved in handling, collection, transportation, processing and disposal of hazardous waste, waste minimization, legislation on hazardous wastes and groundwater contamination. Prerequisite: junior standing.

**CH\_ENG 4226. Engineering Research Calculations and Reporting. 3 Credits.**

Application and analysis of engineering calculations in MS Excel, Matlab, and project-specific software including applications of calculus, experiential learning, and supervised research. Prerequisites: Mathematics [MATH] 4100, must have research advisor define at least one experiment and review at least one report. Graded on A-F basis only.

**CH\_ENG 4270. Design of Experiments and Statistical Quality Control for Process Engineers. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 4270). A practical statistical tool box for experimenters: process means, effects of variables, factorial experiments, and statistical quality control. Prerequisite: experience with Excel or instructor's consent.

**CH\_ENG 4306. Advanced Engineering Math. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 4306). Applies ordinary and partial differential equations to engineering problems; Fourier's series; determinants and matrices; Laplace transforms; analog computer techniques. Prerequisite: Mathematics [MATH] 4100.

**CH\_ENG 4311. Chemodynamics. 3 Credits.**

Environmental movement of chemicals in air, water, and soil; designed to introduce students to the basic principles and techniques useful for the prediction of the movement and fate chemicals in ecosystems. Prerequisites: Chemical Engineering [CH\_ENG] 3234 or instructor's consent.

**CH\_ENG 4312. Air Pollution Control. 3 Credits.**

Modeling of urban air pollution and control techniques. Topics treated are plume dispersion theories, photochemistry, methods of monitoring, methods of industrial abatement and legal aspects. Prerequisites: Chemical Engineering [CH\_ENG] 3234 or instructor's consent.

**CH\_ENG 4315. Introduction to Bioprocess Engineering. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 4315). This general introduction to bioprocess engineering covers the fundamentals of microbiology and biochemistry in the context of a biomass refinery. Analyses proceed through the use of mass balances, energy balances, and empirical or theoretical models. Prerequisites: Biological Engineering [BIOL\_EN] 2180 (for Biological Engineering students) or Chemical Engineering [CH\_ENG] 2225 (for Chemical Engineering students) or instructor's consent.

**CH\_ENG 4316. Biomass Refinery Operations. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 4316). Design and operation of processes for conversion and/or fractionation of biomass and associated upstream and downstream unit operations. Emphasis on separations and product recovery. Prerequisite: Biological Engineering [BIOL\_EN] 2180 or Chemical Engineering [CH\_ENG] 2225 (for Chemical Engineering students) or instructor's consent.

**CH\_ENG 4317. Chemical Processing in Semiconductor Device. 3 Credits.**

This course covers the current plasma processing methods used to produce semiconductor devices with emphasis on memory devices. The physics and chemistry of how plasmas are formed, sustained and interact with the semiconductor wafers being processed. Plasma chemistry

and the chemical reactions used in plasma etching are discussed. Mathematics [MATH] 4100/7100.

**CH\_ENG 4318. Energy Technology and Sustainability. 3 Credits.**

An introductory course on energy technology, resources, practices, and common calculations used for energy analysis. Prerequisite: at least one engineering thermodynamics course or a Physical Chemistry course or instructor's consent. May be repeated for credit.

**CH\_ENG 4319. Introduction to Polymer Materials. 3 Credits.**

An introduction to the structure and properties of polymers. Solution properties, molecular weight determination and rheological behavior are studied. Manufacturing and processing techniques are considered. Prerequisites: Chemical Engineering [CH\_ENG] 3262 and Chemistry [CHEM] 2110.

**CH\_ENG 4321. Introduction to Ceramics. 3 Credits.**

Introductory course in ceramics materials, crystal structure, processes and properties. The course content and level of presentation would allow an entry level engineering to be conversant with the terminology and concepts of ceramic science and engineering. Prerequisite: Chemistry and Physics.

**CH\_ENG 4335. Transport Phenomena. 3 Credits.**

Integrated study of momentum, heat and mass transport. Prerequisites: Chemical Engineering [CH\_ENG] 3235, and Mathematics [MATH] 4100/7100.

**CH\_ENG 4345. Special Reading in Chemical Engineering. 2-5 Credit.**

Individually supervised special reading leading to an engineering report. Prerequisite: senior standing.

**CH\_ENG 4363. Chemical Reaction Engineering and Technology. 3 Credits.**

Reactor design and optimization; rate equations; thermal effects in reactor. Prerequisites: Chemical Engineering [CH\_ENG] 2226, 3235, 3262, or instructor's consent.

**CH\_ENG 4370. Process Control Methods and Laboratory. 3 Credits.**

Stat-space modeling, simulation, and experimental validation; stability analysis; feedback design and experimental studies; methods for disturbance rejection. Prerequisites: Chemical Engineering [CH\_ENG] 2226.

**CH\_ENG 4385. Chemical Engineering Design I. 3 Credits.**

The course presents optimum design methods, cost estimation, material selection and other relevant areas for the design of chemical plants. In addition, chemical safety and risk assessment will be covered. Prerequisite: Chemical Engineering [CH\_ENG] 2226, 3235, 3262, Physics [PHYSICS] 2760, Chemistry [CHEM] 2110.

**CH\_ENG 4464. Electrochemical Reaction Engineering Science. 3 Credits.**

Phenomenological behavior of electrochemical processes (battery emphasis). Theoretical interpretations of diffusion and reaction processes including system modeling. Prerequisite: A course in thermodynamics or physical chemistry; Chemical Engineering [CH\_ENG] 3261 or Mechanical and Aerospace Engineering [MAE] 2300 or Chemistry [CHEM] 3310 or instructor's consent. Graded on A/F basis only.

**CH\_ENG 4980. Process Synthesis and Design. 3 Credits.**

Continuation of Chemical Engineering [CH\_ENG] 4385: application of chemical analysis and modeling to a capstone design project. Prerequisite: Chemical Engineering [CH\_ENG] 4385.

**CH\_ENG 4990. Undergraduate Research in Chemical Engineering. 2-4 Credit.**

Directed study of chemical engineering problems. Prerequisite: instructor's consent.

**CH\_ENG 4995. Undergraduate Research in Chemical Engineering - Honors. 3-6 Credit.**

Individual research for a senior thesis; research is supervised by the chemical engineering faculty. The thesis is to be defended before the departmental Honors committee. Prerequisite: senior standing.

**CH\_ENG 7001. Topics in Chemical Engineering. 3 Credits.**

Current and new technical developments in chemical engineering. Prerequisite: graduate standing and instructor's consent.

**CH\_ENG 7220. Hazardous Waste Management. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7220). Engineering principles involved in handling, collection transportation, processing and disposal of hazardous waste minimization, legislation on hazardous wastes and groundwater contamination. Prerequisite: graduate standing.

**CH\_ENG 7226. Engineering Research Calculations and Reporting. 3 Credits.**

Application and analysis of engineering calculations in MS Excel, Matlab, and project-specific software including applications of calculus, experiential learning, and supervised research. Prerequisites: Mathematics [MATH] 4100, must have research advisor define at least one experiment and review at least one report. Graded on A-F basis only.

**CH\_ENG 7270. Design of Experiments and Statistical Quality Control for Process Engineers. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7270). A practical statistical tool box for experimenters: process means, effects of variables, factorial experiments, and statistical quality control. Prerequisite: experience with Excel or instructor's consent.

**CH\_ENG 7311. Chemodynamics. 3 Credits.**

Environmental movement of chemicals in air, water, and soil; designed to introduce students to the basic principles and techniques useful for the prediction of the movement and fate chemicals in ecosystems. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 3234 or instructor's consent.

**CH\_ENG 7312. Air Pollution Control. 3 Credits.**

Modeling of urban air pollution and control techniques. Topics treated are plume dispersion theories, photochemistry, methods of monitoring, methods of industrial abatement and legal aspects. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 3234 or instructor's consent.

**CH\_ENG 7315. Introduction to Bioprocess Engineering. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7315). This General introduction to bioprocess engineering covers the fundamentals of microbiology and biochemistry in the context of a biomass refinery. Analysis proceed through the use of mass balances, energy balances, and empirical or theoretical models. Prerequisites: Biological Engineering [BIOL\_EN] 2180 (for biological engineering students) or Chemical Engineering [CH\_ENG] 2225 (for chemical engineering students) or instructor's consent.

**CH\_ENG 7316. Biomass Refinery Operation. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7316). Design and operation of processes for conversion and/or fractionation of biomass and associated upstream and downstream unit operations. Emphasis on separations and product recovery. Prerequisite: Biological Engineering



[BIOL\_EN] 2180 or Chemical Engineering [CH\_ENG] 2225 or instructor's consent.

**CH\_ENG 7317. Chemical Processing in Semiconductor Device. 3 Credits.**

This course covers the current plasma processing methods used to produce semiconductor devices with emphasis on memory devices. The physics and chemistry of how plasmas are formed, sustained and interact with the semiconductor wafers being processed. Plasma chemistry and the chemical reactions used in plasma etching are discussed. Prerequisite: graduate standing and Mathematics [MATH] 4100/7100.

**CH\_ENG 7319. Introduction to Polymer Materials. 3 Credits.**

An introduction to the structure and properties of polymers. Solution properties, molecular weight determination and rheological behavior are studied. Manufacturing and processing techniques are considered. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 3262 and Chemistry [CHEM] 2120.

**CH\_ENG 7321. Introduction to Ceramic Material. 3 Credits.**

Introductory course in ceramics materials, crystal structure, processes and properties. The course content and level of presentation would allow an entry-level engineer to be conversant with the terminology and concepts of ceramics science and engineering. Prerequisite: Chemistry and Physics.

**CH\_ENG 7335. Transport Phenomena. 3 Credits.**

Integrated study of momentum, heat and mass transport. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 3235, and Mathematics [MATH] 4100/7100.

**CH\_ENG 7464. Electrochemical Reaction Engineering Science. 3 Credits.**

Phenomenological behavior of electrochemical processes (battery emphasis). Theoretical interpretations of diffusion and reaction processes including system modeling. Prerequisite: A course in thermodynamics or physical chemistry; Chemical Engineering [CH\_ENG] 3261 or Mechanical and Aerospace Engineering [MAE] 2300 or Chemistry [CHEM] 3310 or instructor's consent. Graded on A/F basis only. Graduate standing required.

**CH\_ENG 7980. Synthesis and Design of Chemical Process. 3 Credits.**

This is a heuristics-based design course intended to assist students in bringing together capabilities from previous course. An emphasis is placed on the creation process of design. Prerequisite: graduate standing. Graded on A/F basis only.

**CH\_ENG 8001. Advanced Topics in Chemical Engineering. 3 Credits.**

Prerequisite: instructor's consent.

**CH\_ENG 8029. Advanced Plasma Processing. 3 Credits.**

Concepts and techniques in novel plasma processing: plasma characteristics, plasma sputtering, plasma enhanced chemical vapor deposition (PECVD), plasma etching, plasma treatment, plasma fabrication of nano-structured materials and diamondlike films, biomedical applications. Prerequisite: graduate standing.

**CH\_ENG 8085. Problems in Chemical Engineering. 1-5 Credit.**

Supervised investigation in chemical engineering to be presented in the form of a report. Prerequisite: instructor's consent.

**CH\_ENG 8087. Seminar in Chemical Engineering. 1 Credit.**

Reviews investigations and projects of importance in chemical engineering.

**CH\_ENG 8230. Advanced Ceramic Materials. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] and Mechanical and Aerospace Engineering [MAE] 8230). To provide an advanced level understanding between processing, properties, and microstructure of ceramic materials. Topics include crystallography, defect chemistry, transport properties, microstructure, and forming methods. Graded on A/F basis only.

**CH\_ENG 8320. Plasma Polymerization. 3 Credits.**

Fundamental aspects of polymer formation in plasma state: gas ionization, reaction kinetics, plasma characteristics and operational parameters of plasma reactors. Properties of plasma - synthesized ultrathin films and their utilization also discussed. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 4319 or instructor's consent.

**CH\_ENG 8336. Advanced Heat and Momentum Transfer. 3 Credits.**

Advanced study of these transport phenomena. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 3235 or instructor's consent.

**CH\_ENG 8337. Advanced Mass Transfer. 3 Credits.**

Advanced study of mass transfer. Prerequisite: graduate standing and Chemical Engineering [CH\_ENG] 4336 or instructor's consent.

**CH\_ENG 8338. Analysis of Equilibrium Stage Processes. 3 Credits.**

Advanced study of stage processes. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 2226, 3235 and 3262.

**CH\_ENG 8429. Membranes and Membrane Processes. 3 Credits.**

Thermodynamics and mass transfer of membrane separation processes; Concentration-Driven Processes; Pressure-Driven Processes; Electromembrane Processes; Biological Membrane Processes; Membrane Polymers; Preparation of Membranes; Membrane Separation Application (potable and ultrapure water, effluent treatment, gas separations, electrochemistry, dialysis therapeutic, and other applications).

**CH\_ENG 8451. Advanced Chemical Engineering Thermodynamics I. 3 Credits.**

Advanced thermodynamics; particular reference to its application to chemical engineering. Prerequisite: Chemical Engineering [CH\_ENG] 3262 or instructor's consent.

**CH\_ENG 8463. Chemical Reaction Engineering Science. 3 Credits.**

Phenomenological behavior of catalysts. Theoretical interpretations for heterogeneous and homogeneous catalysts. Prerequisite: Chemical Engineering [CH\_ENG] 4363.

**CH\_ENG 8471. Process Optimization Methods in Chemical Engineering. 3 Credits.**

Steady-state and unsteady-state optimization techniques applied to chemical processes. Prerequisite: Chemical Engineering [CH\_ENG] 2226.

**CH\_ENG 8990. Research-Masters Thesis in Chemical Engineering. 1-99 Credit.**

Independent investigation in chemical engineering, to be presented as a thesis. Graded on a S/U basis only. Prerequisite: Masters candidate.

**CH\_ENG 9990. Research-Doctoral Dissertation in Chemical Engineering. 1-99 Credit.**

Independent investigation in chemical engineering, to be presented as a thesis. Graded on a S/U basis only. Prerequisite: Ph.D. candidate.

## Chemistry (CHEM)

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### **CHEM 1000. Introductory Chemistry. 2 Credits.**

Introductory course for students with no high school background in chemistry. Covers fundamental principles of scientific measurement, stoichiometry, solutions, basic atomic structure, gases. No credit if taken after CHEM 1100. Pre/Co-requisites: MATH 1100/1120.

### **CHEM 1100. Atoms and Molecules with Lab. 3 Credits.**

One-semester introduction for non-science majors to the basic concepts and important applications of chemistry. Satisfies A&S requirement for a laboratory science. No credit if taken after CHEM 1310.

### **CHEM 1320. College Chemistry I. 4 Credits.**

First of two-course sequence emphasizing principles and applications of modern chemical sciences. Covers chemical nomenclature, stoichiometry, kinetic molecular theory, atomic structure, periodic properties, and molecular structure and bonding. Satisfies laboratory science requirement. Prerequisites: MATH 1100/1120 or equivalent. Math Reasoning Proficiency Course.

### **CHEM 1320H. College Chemistry I - Honors. 4 Credits.**

First of a two-course sequence emphasizing principles and applications of modern chemical sciences. Covers chemical nomenclature, stoichiometry, kinetic molecular theory, atomic structure, periodic properties, and molecular structure and bonding. Satisfies laboratory science requirement. Prerequisites: MATH 1100/1120 or equivalent. Honors eligibility required. Math Reasoning Proficiency Course.

### **CHEM 1330. College Chemistry II. 4 Credits.**

Continuation of 1320. Covers intermolecular forces, solutions, kinetics, acid-base chemistry, electrochemistry, nuclear chemistry, thermodynamics. Satisfies requirement for a laboratory science. May be taken concurrently with CHEM 2030 or 2100. Prerequisite: grade of C- or better in CHEM 1320/1320H.

### **CHEM 1330H. College Chemistry II - Honors. 4 Credits.**

Continuation of 1320H. Covers equilibria, kinetics, electrochemistry, nuclear chemistry, thermodynamics. Satisfies requirement for a laboratory science. May be taken concurrently with CHEM 2030 or 2100. Prerequisite: grade of C- or better in CHEM 1320/1320H. Honors eligibility required.

### **CHEM 1500H. Honors Intensive General Chemistry with Lab - Honors. 5 Credits.**

A one-semester, intensive introduction to chemistry for honors-eligible students that takes the place of CHEM 1320, 1330. Four lectures and one 3-hour lab period per week. Prerequisites: honors eligibility, college algebra and one year of high school chemistry or instructor's consent. Math Reasoning Proficiency Course.

### **CHEM 2030. Survey of Organic Chemistry. 3 Credits.**

One-semester introduction to structure and bonding, functional group chemistry, principles of reactivity, reaction mechanisms, the molecules of life. Prerequisite: Grade of C or better in CHEM 1320 or CHEM 1320H or equivalent; CHEM 1330, or CHEM 1330 concurrently, strongly recommended.

### **CHEM 2100. Organic Chemistry I. 3 Credits.**

First course of a two-semester sequence. Structure and bonding; chemistry of hydrocarbons, alkyl halides, alcohols and ethers; reaction mechanisms; principles of reactivity and synthesis; IR and NMR spectroscopy. Only 1 hour credit if taken after 2030 or equivalent.

Prerequisite: grade of C or better in CHEM 1320 or equivalent; CHEM 1330, or 1330 concurrently, strongly recommended.

### **CHEM 2110. Organic Chemistry II. 3 Credits.**

Continuation of CHEM 2100. Aromatic hydrocarbons, carbonyls, amines; chemistry of carbanions; reactions of polar double bonds; nucleic acids, proteins, carbohydrates and fats. Prerequisite: grade of C or better in CHEM 2100 or equivalent, or departmental consent.

### **CHEM 2130. Organic Laboratory I. 2 Credits.**

Basic lab techniques, functional group manipulations, and short syntheses. Pre-lab and post-lab writing assignments. 1 hour recitation, 3 hours lab per week. Concurrent enrollment in CHEM 2110 or 2030 highly recommended. No credit for students who have previous organic laboratory credit.

### **CHEM 2140. Organic Laboratory II. 2 Credits.**

Continuation of CHEM 2130. Preparation and identification of organic compounds; application of instrumental techniques. 2 lab sessions, 1 recitation session per week. Prerequisite: grade of C or better in CHEM 2110 and 2130 or equivalent.

### **CHEM 2160H. Honors Organic Chemistry I - Honors. 4 Credits.**

First course of a two-semester sequence. Similar to CHEM 2100 but with increased depth and breadth; emphasis on preparing science students for research and professional careers. 3 lectures, 1 discussion session per week. Prerequisite: honors eligibility, grade of B or better in CHEM 1320 or equivalent.

### **CHEM 2170H. Honors Organic Chemistry II with Lab - Honors. 5 Credits.**

Continuation of CHEM 2160H; includes laboratory. Content and structure similar to CHEM 2120, but with increased depth and breadth. Prerequisites: honors eligibility, grade of B or better in CHEM 2160H or instructor's permission.

### **CHEM 2190H. Honors Organic Chemistry Laboratory - Honors. 2 Credits.**

Preparation and identification of organic compounds; multistep syntheses; application of instrumental techniques, including NMR, FTIR, MS and HPLC. 2 lab sessions, 1 discussion session per week. Prerequisites: honors eligibility, grade of C or better in CHEM 2170H or equivalent.

### **CHEM 2400. Fundamentals of Inorganic Chemistry with Lab. 3 Credits.**

A systematic introduction with laboratory to inorganic and organometallic compounds, reactions, and periodic properties. Prerequisite: grade of C or better in CHEM 1330.

### **CHEM 2950. Undergraduate Research in Chemistry. 1-3 Credit.**

A laboratory research project and/or preparation of compounds with a written final report. Cannot be substituted for other chemistry courses required for a B.S. or B.A. degree. No more than 6 hrs. total credit. Prerequisites: sophomore standing, 2.75 GPA and/or instructor's consent.

### **CHEM 3200. Quantitative Methods of Analysis with Lab. 4 Credits.**

Principles and practice of quantitative analysis, including the basic principles of modern instrumental methods. Prerequisite: CHEM 1330 or 1500H.

### **CHEM 3300. Fundamentals of Physical Chemistry. 3 Credits.**

Survey of physical chemistry. Satisfies physical chemistry prerequisite for BIOCHM 8430. Prerequisite: MATH 1700, a course in organic chemistry;

PHYSICS 1210 and PHYSICS 1220 or PHYSICS 2175, or PHYSICS 2176 concurrently.

**CHEM 3310. Physical Chemistry I. 3 Credits.**

Lecture only. Topics include the kinetic theory of gases, chemical kinetics, thermodynamics and chemical equilibrium. Prerequisites: one semester organic chemistry and PHYSICS 2175, PHYSICS 2176 and MATH 2300, or MATH 2300 concurrently.

**CHEM 3330. Physical Chemistry II. 3 Credits.**

Continuation of CHEM 3310. Lecture only. Covers wave mechanics, bonding, molecular spectroscopy and statistical mechanics.

**CHEM 3340. Physical Chemistry Laboratory. 3 Credits.**

Prerequisites: Grade of C or better in CHEM 3200; 3330 or 3330 concurrently.

**CHEM 3700. Undergraduate Seminar in Chemistry. 3 Credits.**

Methods for locating and presenting chemical information, data analysis techniques, professional issues. Prerequisites: CHEM 1330 or 1500H; CHEM 2100 or 2160H.

**CHEM 3800. Internship in Chemistry. 1-6 Credit.**

Cannot be substituted for other chemistry courses required for B.S. or B.A. degree. Prerequisites: departmental consent.

**CHEM 3940. Service-Learning in Chemistry. 2 Credits.**

A service-learning community outreach program affording chemistry students with an opportunity to enhance their problem-solving skills. May be repeated once for credit. Satisfies no specific chemistry degree requirements, nor Arts and Science general education requirements. Graded on a S/U basis only. Prerequisites: departmental consent.

**CHEM 4001. Topics in Chemistry- General. 1-99 Credit.**

Organized study designed to broaden the knowledge base of students. Subjects on analytical, inorganic, organic and physical chemistry covered. Prerequisite: departmental consent.

**CHEM 4003. Topics in Chemistry- Natural Science. 1-99 Credit.**

Organized study designed to broaden the knowledge base of students. Subjects on analytical, inorganic, organic and physical chemistry covered. Prerequisite: departmental consent.

**CHEM 4010. Advanced Chemistry Laboratory. 3 Credits.**

Advanced methods for the synthesis and characterization of organic, inorganic, and organometallic compounds. Prerequisite: CHEM 2400, 2140, or 2190H, 3200, 3330 (or 3330 corequisite).

**CHEM 4050. Problems in Chemistry. 1-99 Credit.**

Individual study under the direction of a faculty member that supplements regular course work. Prerequisite: instructor's consent.

**CHEM 4160. Intermediate Organic Chemistry. 3 Credits.**

Stresses synthetic organic chemistry at an intermediate level. Prerequisite: at least one year organic chemistry.

**CHEM 4170. Medicinal Chemistry. 3 Credits.**

Chemical mechanisms of drug action. Topics include drug metabolism and action, chemical toxicology and medicines, enzyme activity, and specific drug case studies. Prerequisite: CHEM 2110, or 2170H, 3300 or 3310 or instructor's consent.

**CHEM 4200. Instrumental Methods of Analysis with Lab. 3 Credits.**

Chemical instrumentation methods including electrochemistry, spectroscopy, and advanced separations techniques. Prerequisites: CHEM 3200, a semester of physical chemistry.

**CHEM 4280. Environmental Chemistry. 3 Credits.**

Surveys the chemistry of air and water environments; discusses the chemistry of waste treatment. Prerequisite: 8 hours chemistry including organic and analytical.

**CHEM 4290. Environmental-Toxicological Chemistry. 3 Credits.**

In-depth study of the chemical aspects of current issues dealing with environmental pollutants and toxic chemical substances. Prerequisite: CHEM 4280 or equivalent.

**CHEM 4400. Inorganic Chemistry. 3 Credits.**

Atomic and molecular structure, bonding, kinetics and mechanism, ligand field theory, coordination compounds, acids and bases. Prerequisite: one semester Physical Chemistry, second semester concurrently.

**CHEM 4490. Physics and Chemistry of Materials. 3 Credits.**

(same as NU\_ENG 4319 and PHYSICS 4190 BIOL\_EN 4480). Undergraduate/graduate level course offered every winter semester for students from Physics, Chemistry, Engineering and Medical Departments and consists of lectures, laboratory demonstrations, two midterm and one final exam. Graduate students will submit a term paper. Prerequisite: PHYSICS 2760 and CHEM 1320 or equivalent and instructor's consent.

**CHEM 4600. Introduction to Radiochemistry with Lab. 3 Credits.**

(same as NU\_ENG 4391). Introduces application of radio-tracer techniques to chemical research. Prerequisite: CHEM 1330 or 1500H; and one semester of physical chemistry, or instructor's consent.

**CHEM 4800. Chemistry Teaching Practicum. 3 Credits.**

Provides practical experience teaching introductory chemistry in discussion and laboratory settings. For students pursuing dual degrees in chemistry and secondary education. Prerequisite: senior standing; departmental consent required. For students pursuing simultaneous dual degrees in chemistry and secondary education. Graded on S/U basis only.

**CHEM 4950. Senior Research. 3 Credits.**

A laboratory research project with approved written goals and a final written report. It may be taken twice. Prerequisites: a 2.75 GPA, departmental consent.

**CHEM 4990H. Senior Honors Research I. 3 Credits.**

A laboratory research experience with a student-instructor prepared outline approved by the Honors Director, a final written report and a final oral presentation and examination. Prerequisites: a 3.33 GPA, departmental consent, and approval of project outline. Honors eligibility required.

**CHEM 4991H. Senior Honors Research II. 3 Credits.**

A laboratory research experience with a student-instructor prepared outline approved by the Honors Director, a final written report and a final oral presentation and examination. Prerequisites: a 3.33 GPA, departmental consent, approval of project outline. Honors eligibility required.

**CHEM 7087. Seminar in Chemistry for Beginning Graduate Students. 1 Credit.**

Prerequisite: graduate standing.

**CHEM 7200. Instrumental Methods of Analysis with Lab. 3 Credits.**

Chemical instrumentation methods including electrochemistry, spectroscopy, and advanced separations techniques. Prerequisites: CHEM 3200, a semester of physical chemistry.

**CHEM 7300. Intermediate Physical Chemistry. 3 Credits.**

Treatment of atomic and molecular, structure and spectroscopy based on quantum concepts. Designed to provide a broad base of knowledge in these fundamental areas to beginning graduate students in chemistry. Prerequisite: departmental consent.

**CHEM 7400. Inorganic Chemistry. 3 Credits.**

Atomic and molecular structure, bonding, kinetics and mechanism, ligand field theory, coordination compounds, acids and bases. Prerequisite: one semester Physical Chemistry, second semester concurrently. Graduate standing required.

**CHEM 7490. Physics and Chemistry of Materials. 3 Credits.**

(same as NU\_ENG 7319 and PHYSICS 7190 and BIOL\_EN 7480). Undergraduate/graduate level course offered every winter semester for students from Physics, Chemistry, Engineering and Medical Departments and consists of lectures, laboratory demonstrations, two midterm and one final exam. Graduate students will submit a term paper. Prerequisite: graduate standing and PHYSICS 2760 and CHEM 1320 or equivalent and instructor's consent.

**CHEM 8003. Topics in Chemistry - Natural Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earned credit may vary from semester to semester. Repeatable upon consent of department. Prerequisite: instructor's consent.

**CHEM 8020. Introduction to X-ray Crystallography. 3 Credits.**

Designed for students in chemistry and related fields. Aimed at offering a practical understanding of single-crystal x-ray structural studies. Includes hands-on laboratory work (data collection and analysis). Prerequisites: instructor's consent.

**CHEM 8050. Non-Thesis Research in Chemistry. 1-99 Credit.**

Does not lead to dissertation.

**CHEM 8085. Topics in Chemistry. 1-99 Credit.**

Organized study of selected topics. Subjects and earned credit may vary from semester to semester. Repeatable upon consent of department. Prerequisite: instructor's consent.

**CHEM 8087. Seminar in Chemistry. 1 Credit.**

Prerequisite: graduate standing.

**CHEM 8090. Thesis/Dissertation(pre-candidacy) Research in Chemistry. 1-99 Credit.**

Research leading to thesis. Graded on a S/U basis only.

**CHEM 8120. Physical Organic Chemistry I. 3 Credits.**

Bonding theory, physical methods, absorption spectroscopy, conformational analysis, mechanism of reactions.

**CHEM 8130. Physical Organic Chemistry II. 3 Credits.**

Case studies and methods for determining organic reaction mechanisms.

**CHEM 8150. Organic Reaction Mechanisms. 3 Credits.**

Organic reaction mechanisms are discussed within a framework of structure-reactivity relationships. Particular attention directed to the chemistry of reactive intermediates and the application of stereochemical and molecular orbital concepts. Prerequisites: 1 year of Organic Chemistry and Physical Chemistry.

**CHEM 8160. Organic Spectroscopy. 3 Credits.**

Structural analysis of organic compounds involving problem solving using modern NMR, IR, UV-VIS, MS CD/ORD and other spectroscopic techniques. Prerequisites: CHEM 3330 or equivalent or instructor's consent.

**CHEM 8170. Applications of the Reactions of Organic Chemistry. 3 Credits.**

Prerequisite: CHEM 8150.

**CHEM 8210. Analytical Measurement. 3 Credits.**

Fundamental and applied aspects of scientific measurements. Topics include: Statistics, signal-to-noise, frequency analysis, sources of noise, digital and analog filtering, time vs. frequency domain measurements, Fourier transformation, sampling, convolution/deconvolution, autocorrelation and cross-correlation. Directed toward entering graduate students.

**CHEM 8230. Separations and Chromatography. 3 Credits.**

Classical and instrumental methods of separation: gas, paper, thin film, and column chromatography; ion exchange.

**CHEM 8240. Mass Spectrometry. 3 Credits.**

This course will cover various aspects of modern mass spectrometry. Topics will include instrumentation, theory, uses and interfaces to mass spectrometry. Graded on A-F basis only.

**CHEM 8250. Analytical Spectroscopy. 3 Credits.**

Selected topics dealing with recent advances in analytical chemistry.

**CHEM 8260. Surface Analysis and Characterization. 3 Credits.**

Covers various aspects of modern methods of surface analysis and characterization. Topics include instrumentation, theory, and data reduction methods. Major sections include electron spectroscopy, microscopy, and vibrational spectroscopy as applied to surfaces. Graded on A-F basis only.

**CHEM 8265. Fluorescence Spectroscopy. 3 Credits.**

Advanced analytical chemistry course that explores the fundamental principles and uses of modern fluorescence spectroscopy in biology, materials science, chemistry, physics and engineering. Special emphasis is placed on the methodologies used to obtain specific information about a particular chemical system. Graded on A-F basis only.

**CHEM 8270. Advanced Analytical Chemistry. 3 Credits.**

Continuation of CHEM 8250.

**CHEM 8280. Bioanalytical Chemistry. 3 Credits.**

This course is aimed at introducing students to the instrumental and theoretical principles by which biological molecules are measured in vivo and in vitro. The course explores how protein, DNA and metabolite structures and quantities are determined in the laboratory with an emphasis on understanding historical methods up through cutting edge approaches in each field. The theory of measurement techniques, separation techniques and related instrumentation are explored in the context of understanding the chemical equilibria that govern each instance. Students will leave this course with a broad understanding for how many biological molecules are measured and what the limitations of various techniques may be. Graded on A-F basis only.

**CHEM 8285. Nanochemistry. 3 Credits.**

Covers various aspects of nanochemistry. Topics include synthesis and characterization of nonmaterial, nanotoxicity, and catalysis. Graded on A-F basis only.

**CHEM 8300. Advanced Physical Chemistry. 3 Credits.**

Advanced Physical Chemistry.

**CHEM 8310. Quantum Chemistry. 3 Credits.**

Introduction to formal quantum mechanical theory, quantum measurement, simple model problems having exact solutions, angular momenta, approximation methods (perturbation theory, variation

principle, WKB), and the structure of many-electron atoms. Prerequisite: CHEM 3330 or equivalent or instructor's consent.

**CHEM 8320. Chemical Kinetics. 3 Credits.**

Factors affecting rates, orders and mechanisms of chemical reactions, with emphasis on current theories and experimental techniques. Prerequisites: CHEM 3330 or equivalent or instructor's consent.

**CHEM 8330. Computational Chemistry. 3 Credits.**

Theory and application of modern computational techniques (molecular mechanics, ab initio and semiempirical molecular orbital methods) for predicting the structures, energies, and properties of molecules and molecular systems. Prerequisite: CHEM 3300 or equivalent or instructor's consent.

**CHEM 8340. Statistical Mechanics. 3 Credits.**

Principles of statistical mechanics and their application to chemical systems; ensemble theory; condensed phases. Prerequisite: CHEM 3330 or equivalent or instructor's consent.

**CHEM 8350. Magnetic Resonance. 3 Credits.**

Basic principles of nuclear magnetic resonance (NMR) and electron spin resonance (ESR), nuclear spin relaxation, current experimental techniques and the application to studies of structures, dynamics and chemical analysis. Prerequisites: One year of organic chemistry, CHEM 3300 or equivalent.

**CHEM 8400. Inorganic Mechanisms. 3 Credits.**

Experimental stoichiometry and rate law determination. Isotopic applications. Methods and results of fast reaction studies. Basic known inorganic mechanisms. Experimental methods of establishing mechanisms of reaction.

**CHEM 8410. Chemistry of the Main Group Elements. 3 Credits.**

Descriptive inorganic chemistry of the main group elements. Textbook material extensively supplemented with information from the current chemical literature.

**CHEM 8420. Supramolecular Chemistry. 3 Credits.**

The basics of supramolecular chemistry will be covered, including host-guest complexes, reorganization, complementarily, thermodynamic interactions, self assembly and biochemical, molecular device and crystal engineering applications. Prerequisites: BS in Chemistry, Biochemistry or Chemical Engineering; graduate standing or instructor's consent. Graded on A/F basis only.

**CHEM 8430. Coordination Chemistry and Reactivity. 3 Credits.**

The chemistry of the transition elements (d-block) and their reactivity will be discussed, including bonding, coordination numbers, oxidation states, and reactivity (kinetics). Prerequisites: Chemistry [CHEM] 4400 or equivalent; graduate standing in chemistry or instructor's consent. Graded on A/F basis only.

**CHEM 8440. Inorganic Structural Methods. 3 Credits.**

Chemical bonding, application of group theory, spectroscopy; diffraction as applied to structure determination; structural implications of dipole moment and magnetic susceptibility measurements.

**CHEM 8450. Organometallics. 3 Credits.**

Condensations effected by organometallics; dissolving metal reductions; sandwich compounds and related organotransition metal derivatives.

**CHEM 8460. Solid State Chemistry. 3 Credits.**

An introduction to the unique aspects of extended solids. Crystal symmetry, group theory and their applications to crystallography. Bonding and electronic structure theories of metals and semiconductors.

Cooperative magnetism and superconductivity. Defects and ionic conductivity. Preparative methods in solid state chemistry. Graduate standing required.

**CHEM 8470. Actinide Chemistry. 3 Credits.**

The course covers the inorganic and organometallic chemistry of the actinides. Graded on A-F basis only.

**CHEM 8480. Chemistry of Nanomaterials. 3 Credits.**

This course will cover several aspects of nanomaterials including synthesis and processing of small particles, as well as their characterization by crystallography, scanning tunneling microscopy magnetism, and other optical properties. Also studied will be the application of quantum confinement to the electronic and optical properties of nanomaterials and the development of photonic materials. The nanostructure of organic polymers, micelles, and the process of biomineralization to make organic-inorganic hybrid materials will also be discussed.

**CHEM 8600. Radiochemistry and Detection with Lab. 3 Credits.**

An introductory course in the applications of radionuclides in chemistry. Topics include radioactive decay, interactions of radiation with matter, radioactive tracers, and nuclear methods of analysis. Directed towards entering graduate students.

**CHEM 8610. Advanced Radiochemistry. 3 Credits.**

Reviews current advances in radiochemistry, hot atom chemistry, radiation chemistry, nuclear spectrometry. Prerequisite: Chemistry [CHEM] 8600 or equivalent.

**CHEM 8620. Nuclear Chemistry. 3 Credits.**

Designed for graduate students in chemistry and related fields. Studies nuclear reaction and nuclear properties. Prerequisites: Chemistry [CHEM] 3300, Mathematics [MATH] 2300 or instructor's consent.

**CHEM 8630. Radiopharmaceutical Chemistry. 3 Credits.**

The radiotracer concept, history of nuclear medicine, radionuclide production, organic and inorganic chemistry of radiopharmaceutical chemistry, and applications will be discussed. Prerequisite: undergraduate organic and inorganic chemistry; graduate standing in chemistry or instructor's consent. Graded on A/F basis only.

**CHEM 8640. Biological Radiochemistry. 3 Credits.**

Covers the interaction of radiation on biological material. The effects of radiation overdose is discussed along with the use of radiation in therapy. Graded on A-F basis only.

**CHEM 9090. Post-candidacy Dissertation Research in Chemistry. 1-99 Credit.**

Research leading to Ph.D. dissertation. Graded on a S/U basis only.

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## Child Health (CH\_HTH)

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**CH\_HTH 6000. Child Health Clerkship. 6-10 Credit.**

Child Health Clerkship.

**CH\_HTH 6010. Rural Child Health Clerkship. 6 Credits.**

Rural Child Health Clerkship.

**CH\_HTH 6100. Remediation 6000 Child Health Clerkship. 6 Credits.**

Child Health Clerkship remediation. Prerequisite: 6000 Child Health Clerkship, received unsatisfactory grade.

**CH\_HTH 6221. Advanced Biomedical Science Medicine Problem Premature Infant. 5 Credits.**

Advanced Biomedical Science Medicine Problem Premature Infant.

**CH\_HTH 6223. ABS Child Health Research. 5-10 Credit.**

ABS Child Health Research.

**CH\_HTH 6225. ABS Child Health Research and Review. 5-10 Credit.**

ABS Child Health Research and Review.

**CH\_HTH 6425. Child Health Genetics. 5 Credits.**

Prerequisites: Child Health clerkship Goals/Objectives: To develop an understanding of medical genetics, including genetic diagnosis, cytogenetics, metabolic genetic diseases, teratology, and the genetics literature, and computer databases. CURRICULUM: During the block, each student will see patients in consultation and in the genetics clinics (general genetics, metabolic, PKU, autism, Down Syndrome, outreach) where they will work up the patients and prepare a report and discussion of the diagnosis or diagnostic differential. Each student will also prepare a literature review around a specific patient or problem. For interested students, cytogenetics or metabolic problems are available.

**CH\_HTH 6426. Child Health Infectious Disease. 5 Credits.**

Child Health Infectious Disease.

**CH\_HTH 6427. Pediatric Hematology/Oncology. 5 Credits.**

Pediatric Hematology/Oncology.

**CH\_HTH 6428. Pediatric Diabetes and Endocrinology. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: 1) To understand the pathophysiology of endocrine and metabolic diseases in childhood. 2) To understand the fundamentals of growth processes in infancy, childhood, and adolescence. CURRICULUM: The Department of Child Health has a large patient care and research program for children with diabetes mellitus. In addition, the Department has a busy general endocrinology program. Thus, students on the elective can participate in the care of patients with a wide spectrum of endocrine and metabolic diseases. Students can carry out specific clinical or laboratory projects relating to specific aspects of either diabetes or endocrine disease, deepen their understanding of pathophysiology of disease and gain a better understanding of the impact of a chronic disorder on the child and his/her family.

**CH\_HTH 6429. Developmental Pediatrics. 5 Credits.**

Developmental Pediatrics.

**CH\_HTH 6430. Pediatric Cardiology. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: Clinical and laboratory material is available to achieve the following objectives: 1) Develop skills in auscultation, resuscitation, treatment of congestive heart failure, and recognition of congenital heart disease in infants. 2) Adequate exposure to pediatric electrocardiography, echocardiography, cineangiography, and interpretation of cardiac catheterization data. 3) Proficiency in the management of postoperative cardio-vascular patients.

**CH\_HTH 6431. Pediatric Pulmonology. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: To gain experience in the treatment of asthma, bronchopulmonary dysplasia, cystic fibrosis, sleep disorders, and other respiratory diseases and to learn about pulmonary function testing in children.

**CH\_HTH 6432. Pediatric Gastroenterology. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: 1) Gain experience in GI diseases of children noting the difference and similarities with adult diseases. 2) To introduce the student to some of the most commonly encountered diagnoses in pediatrics and to its management.

3) To learn to focus on physical diagnosis skills. CURRICULUM: Preceptorship with a pediatric subspecialist for four weeks will include inpatient and outpatient service activities.

**CH\_HTH 6433. Child Health Sports Medicine. 5 Credits.**

Child Health Sports Medicine.

**CH\_HTH 6434. Child Adolescent Medicine. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: To teach 4th year students the intricacies of care of the adolescent patient. Specifically, the rotation will address the adolescent interview, important considerations in the adolescent "check-up", and managing the varied problems in adolescents, from attention deficit disorder to eating disorders and gynecological issues. The student will leave the rotation with a better understanding of the care of adolescents. CURRICULUM: These objectives will be met in the following manner: 1) Student will actively participate in adolescent medicine clinic with both clinical attendings. He/she will be responsible for the initial evaluation of the patients in the clinic, will actively participate in clinical decision-making, and will be responsible for helping with patient write-ups and referral letters (at the discretion of the attending). The student will be expected to function on an extern level, following up on laboratory evaluations and checking in with patients seen, when needed. 2) The student will participate in the adolescent interview practice sessions with the interact teen theatre with the residents on the rotation. This process will help to improve interviewing skills with adolescents. 3) The student will be responsible for helping with any inpatient care, including consultations and/or admissions. 4) The student will be asked to identify particular areas of interest to be used as topics for interactive discussion with one of the attendings or for a short paper.

**CH\_HTH 6435. Ped Renal and Rheumatology. 5 Credits.**

4th year elective for renal/rheumatology rotation, four weeks.

Prerequisite: 3rd year Pediatrics/Child Health or Internal Medicine rotation.

**CH\_HTH 6706. Internal Medicine Hematology and Medical Oncology Rural Elective. 5 Credits.**

The student will work as part of a team providing hands-on clinical services in a rural outpatient setting. Students will participate in daily morning report and other didactic sessions provided by the rotation site. Students will learn using a variety of evidence-based resources, direct observations and demonstration. Prerequisites: Child Health [CH\_HTH] 6002; restricted to medical students only.

**CH\_HTH 6725. Developmental Pediatrics - Rural. 5 Credits.**

Rural developmental pediatrics general elective. Prerequisite: Child Health [CH\_HTH] 6000. Restricted to fourth year medical students.

**CH\_HTH 6726. Child Health Rural Elective. 5 Credits.**

Students will enhance their knowledge about patient-centered care of children through active participation in a primarily outpatient clinical experience. Limited inpatient experience may be offered as well. Prerequisite: Child Health [CH\_HTH] 6000; restricted to medical students only.

**CH\_HTH 6825. General Child Health - Inpatient. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: To provide additional experience in general pediatrics in inpatient care. CURRICULUM: The student will function as a member of the house staff team assuming many of the roles of the first year resident in patient care. This includes working up of patient's management plans, rounding, staffing, conferences, etc. Night coverage with supervision is included.

**CH\_HTH 6826. General Child Health - Outpatient. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: To provide additional experience in general pediatrics in outpatient care.

CURRICULUM: The student will function as a member of the healthcare team. This includes taking histories, performing physical exams, and working up patient management plans. This may require working evening clinic and Saturday clinic in addition to regular daytime clinics.

**CH\_HTH 6827. Neonatology/Neonatal Intensive Care Unit. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: To gain experience: 1) in the evaluation, diagnosis, and management of sick newborns, and 2) in the performance of specialized procedures necessary for ICU care. CURRICULUM: The student will function as a first-year house officer, with his/her own neonatal ICU patients for initial work-up and management, under the supervision of the PL-2 or PL-3 and attending staff. (rotation at Columbia Regional Hospital).

**CH\_HTH 6828. Pediatric Intensive Care Unit. 5 Credits.**

Prerequisites: Child Health Clerkship. Goals/Objectives: 1) To provide the student with the initial approach and management of children requiring care in the Pediatric Intensive Care Unit. 2) To provide the student with the basics of airway management in children. 3) To provide the student with an understanding of the preoperative assessment with preparation of pediatric patients. 4) To provide the student with an introduction to the perioperative management of common pediatric surgical problems. CURRICULUM: Students in this elective will spend time in both the Pediatric ICU and the operating rooms. They will be required to participate in daily rounds in the PICU and follow the medical/surgical patients admitted to the PICU.

**CH\_HTH 6829. Pediatric Neurology. 5 Credits.**

Pediatric Neurology.

## Chinese (CHINSE)

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**CHINSE 1100. Elementary Chinese I. 6 Credits.**

For beginners with no prior knowledge of Chinese. Five hours of classroom instruction, with one hour lab work weekly.

**CHINSE 1200. Elementary Chinese II. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly. Prerequisite: C- or better in Chinese [CHINSE] 1100 or equivalent.

**CHINSE 2001. Undergraduate Topics in Chinese-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester.

**CHINSE 2005. Undergraduate Topics in Chinese - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. No knowledge of Chinese required. No language credit.

**CHINSE 2100. Everyday Spoken Chinese Level I. 3 Credits.**

Reinforces and extends ability to use Chinese language for spoken communication. Studies situation-specific Chinese in real-life situations. Intended to supplement, not replace, Chinese language courses taught on MU campus. Prerequisite: Chinese [CHINSE] 1200. Restricted to students enrolled in MU China Study Abroad.

**CHINSE 2160. Intermediate Chinese I Conversation and Composition. 3 Credits.**

Prerequisite: C- or better in Chinese [CHINSE] 1200 or equivalent.

**CHINSE 2310. Chinese Civilization I. 3 Credits.**

Survey of Chinese culture and arts. No knowledge of Chinese is required. No foreign language credit.

**CHINSE 2330. Chinese Language and Culture. 3 Credits.**

Presents information about the development of Chinese language over time, the variety of dialects spoken in China, and around the world. Explores relationship between Chinese language and culture. Considers different genres of Chinese literature. Visits to sites significant to development of Chinese language and literature. Introduction to calligraphy and basic daily Chinese. Must be enrolled in MU China Study Abroad. Sophomore standing required.

**CHINSE 3005. Topics in Chinese - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing and instructor's consent.

**CHINSE 3085. Problems in Chinese. 1-3 Credit.**

Supervised study in Chinese language and/or culture. Prerequisite: instructor's consent.

**CHINSE 3160. Intermediate Chinese II Conversation and Composition. 3 Credits.**

Continuation of Chinese [CHINSE] 2160. Introduces more complex grammatical constructions and extends ability to use those constructions for written and oral communication. Successful completion of course will enable students to communicate in Mandarin Chinese regarding everyday topics, with a vocabulary of just over 1900 words, and about 380 sentence patterns. Prerequisites: C- or higher in Chinese [CHINSE] 2160, or instructor's consent.

**CHINSE 3170. Everyday Spoken Chinese Level II. 3 Credits.**

For students who have completed 18 credits college-level Chinese. Reinforces and extends ability to use Chinese language for Spoken communication. Class-time spent studying situation-specific Chinese in real-life situations. Intended to supplement, not replace, Chinese language courses taught on UMC campus. Prerequisite: Chinese [CHINSE] 3160 or consent of instructor. Restricted to students enrolled in the MU China Study Abroad.

**CHINSE 3180. Advanced Chinese I. 3 Credits.**

Improves vocabulary, listening, spoken and written Chinese Skills. Discusses basic cultural ideas. Prerequisite: C- or higher in Chinese [CHINSE] 3160, or equivalent. Graded on A/F basis only.

**CHINSE 3300. Chinese Traditions and Global Integration. 3 Credits.**

Focuses on developments in China's International relations that have led to prominence on world stage, and the impact of modernization and integration into world community on China's sense of national identity, shape of Chinese culture, and lives of the people. Visits to cultural and business sites, guest lectures, and conversations with Chinese people. Must be enrolled in MU China Study Abroad. Sophomore standing required.

**CHINSE 3300H. Chinese Traditions and Global Integration - Honors. 3 Credits.**

Focuses on developments in China's International relations that have led to prominence on world stage, and the impact of modernization and integration into world community on China's sense of national identity, shape of Chinese culture, and lives of the people. Visits to cultural and business sites, guest lectures, and conversations with Chinese people. Prerequisites: Must be enrolled in MU China Study Abroad. Sophomore standing required. Honors eligibility required.

**CHINSE 3320. Modern and Contemporary Chinese Fiction (in translation). 3 Credits.**

Studies Chinese fiction from 1920s to 1990s. Preceded by a brief historical survey of Chinese literature. Analyzes works by authors like Lu Xun, Ba Jin, Lao She, Wang Meng and many others of the younger generation. Readings and lectures in English.

**CHINSE 3400. Negotiating Chinese Culture. 3 Credits.**

As political, business, religious, and personal encounters between Chinese and Americans increase, so also does the need for competence in negotiating these cross-cultural interactions. Whether hosting Chinese guests, visiting China for business or as a scholar, or simply trying to understand current events, a clear understanding of cultural differences and similarities can be quite valuable. Students will be introduced to multiple perspectives on American and Chinese cultural differences along with narratives of cross-cultural experiences. Course address issues related to American and Chinese cross-cultural communication in five spheres of interaction: political, religious, business, interpersonal, education. Through related readings, discussions, and structured conversations with Chinese, students will explore how this information and a deeper understanding of Chinese and American culture can be applied to more fruitful and positive cross-cultural interactions in multiple contexts. Prerequisite: sophomore standing or instructor's consent.

**CHINSE 3880. Contemporary Chinese Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3880). Introduces development of 20th century Chinese film and popular genres, including review of earlier times. Explores how present day Chinese understand their own history, and issues they face in drive toward modernization in a global context. Films and readings in English or with English subtitles. No previous knowledge of the culture or language required. Prerequisite: sophomore standing.

## **Civil Engineering (CV\_ENG)**

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**CV\_ENG 1000. Introduction to Civil Engineering. 1 Credit.**

Introduces various aspects of Civil Engineering practice. May be repeated one time for credit.

**CV\_ENG 1001. Experimental Course. 1-99 Credit.**

For freshman-level students. Content and number of credit hours to be listed in Schedule of Courses.

**CV\_ENG 2001. Experimental Course. 1-99 Credit.**

For sophomore-level students. Content and number of credit hours to be listed in Schedule of Courses.

**CV\_ENG 2080. Introduction to Dynamics. 3 Credits.**

Basic fundamentals of particle and rigid body dynamics; energy and momentum methods. Prerequisite: Engineering [ENGINR] 1200.

**CV\_ENG 3001. Fundamental Topics in Civil Engineering. 1-3 Credit.**

Special engineering topics for undergraduate students. Prerequisite: instructor's consent.

**CV\_ENG 3010. Decision Methods for Civil Engineering Design. 3 Credits.**

Essential features of civil engineering including the design process, design teams, experimental and computational tools, engineering economy, communication skills, and ethical considerations. Prerequisite: grade of C- or better in English [ENGLSH] 1000. Co-requisite: Engineering [ENGINR] 1200.

**CV\_ENG 3050. Introduction to Geographic Information Systems GIS. 3 Credits.**

(same as Geography [GEOG] 3040) Introduces theory, concepts and techniques related to the creation, manipulation, processing, and basic analysis of spatial data using GIS. Data management, current data models, GIS applications and course topics are reinforced through hands-on computer laboratory exercises. Prerequisite: sophomore standing or instructor's consent.

**CV\_ENG 3100. Fundamentals of Transportation Engineering. 4 Credits.**

Covers fundamentals of transportation engineering including geometric design, traffic engineering, pavements, and planning. Prerequisite: grade of C- or better in Engineering [ENGINR] 1100. Corequisite: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 3200. Fundamentals of Environmental Engineering. 4 Credits.**

Fundamentals of water quality engineering and water resources, water and wastewater treatment, solid and hazardous and radioactive waste management, air pollution, environmental regulation, and environmental ethics. Prerequisite: grade of C- or better in Chemistry [CHEM] 1320 or equivalent; co-requisite: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 3250. Pollutant Fate and Transport. 3 Credits.**

(same as Environmental Science [ENV\_SC] 3250). Introduction to concepts governing pollutant fate and transport in the environment, including pollutant interactions within and migration through environmental systems, as well as analytical techniques and tools necessary to quantify conditions and movement. Prerequisites: Environmental Sciences [ENV\_SC] 1100 or Soil Science [SOIL] 2100 or Civil Engineering [CV\_ENG] 3200; and Chemistry [CHEM] 1320; or instructor's permission.

**CV\_ENG 3300. Structural Analysis I. 4 Credits.**

Analysis of statically determinate beams, frames; shear and moment diagrams; influence line diagrams; beam deflections. Analysis of statically indeterminate structures; moment distribution; energy methods. Introduction to matrix analysis. Prerequisites: grade of C- or better in Engineering [ENGINR] 1200 and ENGINR 2200.

**CV\_ENG 3312. Reinforced Concrete Design. 3 Credits.**

Basic principles of reinforced concrete design. Design of beams for flexure and shear; design of short and slender columns. Prerequisite: Civil Engineering [CV\_ENG] 3300; Corequisite: Civil Engineering [CV\_ENG] 3600.

**CV\_ENG 3313. Structural Steel Design. 3 Credits.**

Basic principles of structural steel design. Design of beams, axially loaded members, columns, and bolted and welded connections. Corequisites: Civil Engineering [CV\_ENG] 3300 and 3600.

**CV\_ENG 3400. Fundamentals of Geotechnical Engineering. 4 Credits.**

Detailed study of physical and mechanical properties of soil governing its behavior as an engineering material. Prerequisite: grade of C- or better in Engineering [ENGINR] 2200 and Geology [GEOL] 1150.

**CV\_ENG 3600. Civil Engineering Materials. 4 Credits.**

Introduces composition, structure, properties, behavior, and selection of civil engineering materials. Prerequisites: grade of C- or better in Engineering [ENGINR] 2200 or instructor's consent; co-requisite: Civil Engineering [CV\_ENG] 3010.



**CV\_ENG 3700. Fluid Mechanics. 3 Credits.**

Statics and dynamics of fluids, principles of continuity, momentum and energy, pipe flow. Prerequisite: grade of C- or better Physics [PHYSICS] 2750.

**CV\_ENG 3702. Hydrology. 4 Credits.**

Fundamental concepts of hydrology in engineering; quantitative estimation of stream-flow magnitude and frequency; and open channel flow considerations from stream-flow. Fluid Mechanics lab with lab reports. Prerequisites: grade of C- or better Mathematics [MATH] 2300 and Civil Engineering [CV\_ENG] 3200 and 3700.

**CV\_ENG 4001. Topics in Civil Engineering. 1-3 Credit.**

Study of current and new technical developments in civil engineering. Prerequisite: instructor's consent.

**CV\_ENG 4006. Digital Computer Applications in Engineering. 3 Credits.**

Use of digital computer for solution of engineering problems involving roots of equations, simultaneous equations, curve fitting, integration, differentiation, and differential equations. Prerequisites: Mathematical [MATH] 2300.

**CV\_ENG 4008. Risk and Reliability for Civil Engineers. 3 Credits.**

This course focuses on how to use probability and statistics to quantify uncertainties and consider risks when making civil engineering decisions and designing civil engineering systems. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3010 or other introductory probability/statistics course.

**CV\_ENG 4080. Advanced Surveying. 3 Credits.**

Celestial observations for determination of position; state coordinate systems, precise surveys, introduction to geodetic surveys, principles of photogrammetry. Theory of optical surveying instruments. Prerequisites: Mathematics [MATH] 1500.

**CV\_ENG 4085. Problems in Civil and Environmental Engineering. 2-4 Credit.**

Directed investigation of civil engineering. Prerequisite: instructor's consent.

**CV\_ENG 4100. Traffic Engineering. 3 Credits.**

Characteristics and studies associated with highway traffic. Capacity analysis and evaluation of freeways, rural highways, and urban streets. Traffic signal control and coordination. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 4102. Infrastructure Management. 3 Credits.**

Civil infrastructure condition assessment, performance modeling, deterioration processes and models, maintenance and rehabilitation strategies, management techniques, data analysis, management systems, financing, case studies, emerging technologies. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 4103. Planning and Geometric Design of Highways. 3 Credits.**

Techniques of highway planning in rural and urban areas. Design of the visible elements of highways. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 4104. Pavement Materials and Design. 3 Credits.**

Properties of materials used in roads, airports and other pavement construction. Design methods for rigid and flexible pavements. Prerequisites: grade of C- or better in Engineering [ENGINR] 2200.

**CV\_ENG 4106. Intelligent Transportation Systems. 3 Credits.**

This is an introductory course in Intelligent Transportation Systems (ITS). Topics include the theory of transportation networks and systems optimization, current implementations of ITS, and practical issues and implications of ITS. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 4108. Bicycle and Pedestrian Transportation. 3 Credits.**

This course teaches how to integrate pedestrian and bicyclist accommodations into the planning and design of transportation facilities. Topics include bicyclist safety, accommodation at intersections, traffic calming techniques and facility design. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 4110. Transportation Simulation. 3 Credits.**

Theory and application of simulation in transportation engineering. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 4120. Airport Engineering. 3 Credits.**

Airport systems planning, design, and management. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 4125. Transportation Legal Issues. 3 Credits.**

This course discusses some of the legal issues that transportation engineers encounter throughout the course of their careers. Prerequisites: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 4130. Transportation Safety. 3 Credits.**

This course is an introduction to transportation safety. The focus will be on surface transportation. The student is expected to analyze safety data and to devise engineering solutions to safety problems. Prerequisite: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 4145. Civil and Environmental Engineering Legal Issues. 3 Credits.**

Discussion of legal issues facing civil engineers including right of way, risk and liability, environment, financing public works, contracting and ethics. Prerequisite: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 4155. Transportation Geography. 3 Credits.**

(same as Geography [GEOG] 4850). Introduction to fundamental concepts and modes of analysis in transportation geography. Focus on descriptive, explanatory, as well as normative approaches. Topics reviewed include spatial organization, transportation economics, spatial interaction, network analysis, location/allocation, and urban transportation planning.

**CV\_ENG 4175. The Geospatial Science in National Security. 3 Credits.**

(Same as Geography [GEOG] 4130). This course explores the critical contribution of the geospatial sciences in the collection processing, visualization and analysis of geospatial information related to national security. Prerequisite: junior standing or above required; instructor's consent. May be repeated for credit.

**CV\_ENG 4185. Location Analysis/Site Selection. 3 Credits.**

(same as Geography [GEOG] 4740). An overview of location analysis in regional planning and spatial decision support, this course focuses on the use of Geographic Information Science (GIS) and location analysis methods in addressing regional service needs. Maybe be repeated for credit.

**CV\_ENG 4190. Infrastructure Project Development. 3 Credits.**

Students will learn how the key elements of major civil engineering infrastructure projects fit together. The course will focus on the horizontal integration of: financing - planning - environment - right of way - design

- construction - operations - maintenance. Engineering is important but so are a lot of other things. Graded on A-F basis only. Prerequisite: junior standing.

**CV\_ENG 4200. Remote Sensing of the Environment. 3 Credits.**

Principles, characteristics and applications of remote sensing in engineering, geosciences, agriculture and environmental projects. Topics: basic concepts, photographic, thermal multispectral and microwave systems, satellite remote sensing and digital image processing. Prerequisites: junior standing.

**CV\_ENG 4210. Solid Waste Management. 3 Credits.**

Engineering principles involved in generation, handling, collection, transport, processing, and disposal of solid wastes, resource recovery and reuse, legislation on solid wastes and groundwater contamination problems. Prerequisite: junior standing.

**CV\_ENG 4220. Hazardous Waste Management. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 4220). Engineering principles involved in handling, collection, transportation, processing and disposal of hazardous wastes, waste minimization, legislation on hazardous wastes and groundwater contamination.

**CV\_ENG 4230. Introduction to Water Quality. 3 Credits.**

Methods for determining and characterizing water quality, effects of pollution on streams and lakes, and an introduction to engineered systems for the distribution, collection and treatment of water and wastewater. Prerequisite: junior standing.

**CV\_ENG 4232. Water and Wastewater Treatment Facilities. 3 Credits.**

Physical, chemical, and biochemical processes for treating drinking water supplies and wastewaters (domestic and industrial), with emphasis on planning and design of such facilities. Prerequisites: Civil Engineering [CV\_ENG] 4230/7230 or instructor's consent.

**CV\_ENG 4240. Water Quality Analysis. 3 Credits.**

Chemical, physical and biological methods for analysis of streams, lakes, wastewaters and water supplies and their use in water quality management. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 4230 or instructor's consent.

**CV\_ENG 4250. Environmental Regulatory Compliance. 3 Credits.**

Systems of water law; provisions of major federal environmental laws and regulations; development of regulations at the federal, state, and local levels; regulatory frameworks; permits; and enforcement.

**CV\_ENG 4260. Environmental Public Policy. 3 Credits.**

Engineering and economic aspects of environmental policy. Basic understanding of environmental statutes and case law.

**CV\_ENG 4270. Environmental Engineering Microbiology. 3 Credits.**

Theory and application of fundamental principles of microbiology, ecology, and aquatic biology of the microorganisms of importance to sanitary engineers. Prerequisite: senior standing or instructor's consent.

**CV\_ENG 4285. Pollution Prevention: Applied Engineering for Sustainable Business Practices. 3 Credits.**

Identify, analyze and solve energy, water and raw materials inefficiencies common to industrial processes and facilities. Restricted to Juniors and Seniors. Prerequisites: Physics [PHYSICS] 2760, Mathematics [MATH] 2300, Chemistry [CHEM] 1320, Engineering [ENGINR] 2300 or equivalent. Graded on A-F only basis.

**CV\_ENG 4290. Wastewater Treatment and Process Design. 3 Credits.**

Selection and use of wastewater and sludge treatment processes, disposal methods, sustainable wastewater treatment including anaerobic treatment of wastewater reuse. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3200. Instructor's consent required.

**CV\_ENG 4300. Advanced Structural Steel Design. 3 Credits.**

Design of steel structures and bridges. Topics include composite beams, plate girder design, and moment resistant connections. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3313.

**CV\_ENG 4302. Prestressed/Advanced Reinforced Concrete. 3 Credits.**

Principles of prestressing. Constituent materials, loading and allowable stresses. Working and ultimate stress analysis and design. Shear and torsion. Deflections. Prestress losses. Continuous beams. Composite beams. Compression members. Footings. Co-requisite: Civil Engineering [CV\_ENG] 3312.

**CV\_ENG 4310. Structural Design and Analysis. 3 Credits.**

Design and analysis of building frames and bridges in steel and concrete using case studies. Economic selection of structural type and material. Basic methods of analysis for statically indeterminate structures. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 4300.

**CV\_ENG 4320. Energy Methods in Mechanics. 3 Credits.**

Variational mechanics including practical examples. Topics include calculus of variation of boundary value problems, energy methods such as Ritz and Galerkin methods, approximate solutions methods such as the finite element and finite difference, and eigenvalue problems. Prerequisites: senior or graduate standing required.

**CV\_ENG 4330. Structural System Design. 3 Credits.**

Design of buildings in steel and reinforced concrete, including estimation of loads and design of gravity and lateral force resisting systems. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3312 and 3313.

**CV\_ENG 4350. Matrix Methods of Structural Analysis. 3 Credits.**

An introduction to the fundamentals of stiffness and flexibility methods for analysis of truss and frame structures. Application of the STRUDL and NASTRAN programs to three dimensional structures. Prerequisite: senior standing; grade of C- or better in Civil Engineering [CV\_ENG] 3300.

**CV\_ENG 4360. Bridge Engineering. 3 Credits.**

Review of Highway Bridge Analysis and Design Fundamentals. Study of Influence Line Diagrams and Shear and Moment Envelopes. Design of Medium- and Short-Span Girder Bridges based on AASHTO LRFD specs. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3312 and 3313.

**CV\_ENG 4404. Geotechnical Earthquake Engineering. 3 Credits.**

This course provides an introduction to geotechnical aspects of earthquake engineering. Topics include: basic seismology, seismic hazard analysis, dynamic soil properties, site response analysis and soil liquefaction. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 4406. Geotechnics of Landfill Design. 3 Credits.**

This course will focus on geotechnical and construction aspects in the analysis, design and construction of waste containment facilities (landfills) including expansions of existing facilities. Prerequisite: instructor's consent.

**CV\_ENG 4410. Foundation Engineering. 3 Credits.**

Subsurface exploration. Design of basic foundation structures, shallow foundations, retaining walls, deep foundations. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3400.

**CV\_ENG 4412. Applied Geotechnical Engineering. 3 Credits.**

Study of concepts, theories, and design procedures for modern earthwork engineering including: compaction and densification of soils and soil improvement, seepage and drainage, slope stability and performance, and earth retaining structures. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3400.

**CV\_ENG 4500. Introduction to Construction Management. 3 Credits.**

Structure of the construction industry; construction drawings and specifications; estimating and bidding; construction contracts, bonds and insurance; planning and scheduling of construction operations; project management; computer techniques. Prerequisite: junior standing.

**CV\_ENG 4600. Advanced Mechanics of Materials. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 4600). Analysis of more complicated problems in stresses, strains. Prerequisite: grade of C- or better in Engineering [ENGINR] 2200.

**CV\_ENG 4610. Sensors and Experimental Stress Analysis. 3 Credits.**

Sensors and instrumentation for stress analysis, mechanical measurement and health monitoring of civil structures. Application and design of data acquisition systems, basic digital signal processing. Electronics and instrumentation circuits. Prerequisite: grade of C- or better in Engineering [ENGINR] 2200 and Physics [PHYSICS] 2760.

**CV\_ENG 4660. Vibration Analysis. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 4660). Vibration theory with application to mechanical systems. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 2080 and Mathematics [MATH] 4100.

**CV\_ENG 4692. Introduction to Structural Dynamics. 3 Credits.**

Theory of structural response to dynamic loads. Computation of dynamic response of structures to dynamic loads like blast and earthquake. Modal analysis and single degree of freedom methods will be covered. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3300.

**CV\_ENG 4700. Hydraulics of Open Channels. 3 Credits.**

Gradually varied flow and theory of the hydraulic jump. Slowly varied flow involving storage; rating curves. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3700.

**CV\_ENG 4703. Applied Hydrology. 3 Credits.**

Modern methods of applied hydrologic analysis and synthesis of hydrologic records. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3700 and 3702 or instructor's consent.

**CV\_ENG 4710. Soil and Water Conservation Engineering. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 4150). Urban and rural run-off and erosion analysis. Design and layout of erosion control structures. Prerequisites: Biological Engineering [BIOL\_EN] 2180 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**CV\_ENG 4720. Watershed Modeling Using GIS. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 4350). Watershed evaluation using AVSWAT for hydrology, sediment yield, water quality; includes USLE, MUSLE, WEPP, Procedures for model calibration/sensitivity data analysis. Prerequisites: Biological Engineering [BIOL\_EN] 2180 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**CV\_ENG 4792. Analysis of Water-Resource Systems. 3 Credits.**

Applies hydrology, hydraulic and sanitary engineering, and economics to water-resource design problems considering man and his environment. Uses methods of systems analysis. Prerequisite: instructor's consent.

**CV\_ENG 4980. Civil Engineering Systems Design. 3 Credits.**

Design of civil engineering systems. Prerequisite: senior standing in Civil Engineering at the University of Missouri-Columbia or written consent of Chairman.

**CV\_ENG 4990. Undergraduate Research in Civil and Environmental Engineering. 1-4 Credit.**

Independent investigation or project in Civil Engineering. Prerequisites: senior standing in Civil and Environmental Engineering and instructor's consent. May be repeated to 6 hours.

**CV\_ENG 4995. Research in Civil & Environmental Engineering-Undergraduate Honors. 1-3 Credit.**

Independent project, supervised by the honors advisor, to be presented as a formal written report. Prerequisite: participation in the Civil and Environmental Engineering Departmental Honors Program.

**CV\_ENG 7001. Topics in Civil Engineering. 1-3 Credit.**

Study of current and new technical developments in civil engineering. Prerequisite: graduate standing and instructor's consent.

**CV\_ENG 7002. Analysis of Civil Engineering Decisions. 3 Credits.**

Formulates and analyzes probabilistic models of civil engineering systems and their environment. Elementary theory of decision making under uncertainty. Application to selected civil engineering problems. Prerequisite: graduate standing.

**CV\_ENG 7003. Optimization of Civil Engineering Systems. 3 Credits.**

Automated design techniques such as linear, nonlinear, and dynamic programming; gradient and random searching. Civil engineering applications emphasized throughout. Prerequisite: graduate standing.

**CV\_ENG 7004. Engineering Administration. 3 Credits.**

Cash flow analysis, financial analysis, managerial accounting and cost control, budgeting, organizational structure and behavior. Prerequisite: graduate standing and Mathematics [MATH] 1300 or 1500, or instructor's consent.

**CV\_ENG 7006. Digital Computer Applications in Engineering. 3 Credits.**

Use of digital computer for solution of engineering problems involving roots of equations, simultaneous equations, curve fitting, integration, differentiation, and differential equations. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**CV\_ENG 7007. Quality Management in Civil Engineering. 3 Credits.**

Quantitative and qualitative quality planning and analysis concepts, including statistical tools and total quality management techniques, control, measurement and assessment. Prerequisite: graduate standing. Graded on A/F basis only.

**CV\_ENG 7008. Risk and Reliability for Civil Engineers. 3 Credits.**

This course focuses on how to use probability and statistics to quantify uncertainties and consider risks when making civil engineering decisions and designing civil engineering systems. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3010 or other introductory probability/statistics course.

**CV\_ENG 7080. Advanced Surveying. 3 Credits.**

Celestial observations for determination of position; state coordinate systems, precise surveys, introduction to geodetic surveys, principles of

photogrammetry. Theory of optical surveying instruments. Prerequisites: graduate standing and Civil Engineering [CV\_ENG] 2090 and Mathematics [MATH] 1500.

**CV\_ENG 7082. Property Boundary Location. 3 Credits.**

Principles of real property ownership, deeds, property boundary surveying, legal principles of original and retracement surveys Missouri statutes and regulations affecting surveying, GLO corner restoration and re-establishment. Prerequisites: graduate standing and Engineering [ENGINR] 1500 and Civil Engineering [CV\_ENG] 2090.

**CV\_ENG 7100. Traffic Engineering. 3 Credits.**

Characteristics and studies associated with highway traffic. Capacity analysis and evaluation of freeways, rural highways, and urban streets. Traffic signal control and coordination. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 7102. Infrastructure Management. 3 Credits.**

Civil infrastructure condition assessment, performance modeling, deterioration processes and models, maintenance and rehabilitation strategies, management techniques, data analysis, management systems, financing, case studies, emerging technologies. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 7103. Planning and Geometric Design of Highways. 3 Credits.**

Techniques of highway planning in rural and urban areas. Design of the visible elements of highways. Prerequisites: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 7104. Pavement Materials and Design. 3 Credits.**

Properties of materials used in roads, airports and other pavement construction. Design methods for rigid and flexible pavements. Prerequisites: grade of C- or better in Engineering [ENGINR] 2200.

**CV\_ENG 7106. Intelligent Transportation Systems. 3 Credits.**

This is an introductory course in Intelligent Transportation Systems (ITS). Topics include the theory of transportation networks and systems optimization, current implementations of ITS, and its practical issues and implications of ITS. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 7108. Bicycle and Pedestrian Transportation. 3 Credits.**

This course teaches how to integrate pedestrian and bicyclist accommodations into the planning and design of transportation facilities. Topics include, including pedestrian and bicyclist safety, accommodation at intersections, traffic calming techniques and facility design. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3100.

**CV\_ENG 7109. Urban Development and Planning. 3 Credits.**

Introduction to planning processes; procedures and forces that shape urbanization. Prerequisite: graduate standing.

**CV\_ENG 7110. Transportation Simulation. 3 Credits.**

Theory and application of simulation in transportation engineering. Prerequisite: C- or better in CV\_ENG 3100.

**CV\_ENG 7120. Airport Engineering. 3 Credits.**

Airport systems planning, design, and management. Prerequisite: C- or better in Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 7125. Transportation Legal Issues. 3 Credits.**

This course discusses some of the legal issues that transportation engineers encounter throughout the course of their careers. Prerequisite: Civil Engineering [CV\_ENG] 3010. Graduate standing required.

**CV\_ENG 7130. Transportation Safety. 3 Credits.**

This course is an introduction to transportation safety. The focus will be on surface transportation. The student is expected to analyze safety data and to devise engineering solutions to safety problems. Prerequisite: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 7145. Civil and Environmental Engineering Legal Issues. 3 Credits.**

Discussion of legal issues facing civil engineers including right of way, risk and liability, environment, financing public works, contracting and ethics. Prerequisite: Civil Engineering [CV\_ENG] 3010.

**CV\_ENG 7155. Transportation Geography. 3 Credits.**

(same as Geography [GEOG] 7850). Introduction to fundamental concepts and modes of analysis in transportation geography. Focus on descriptive, explanatory, as well as normative approaches. Topics reviewed include spatial organization, transportation economics, spatial interaction, network analysis, location/allocation, and urban transportation planning.

**CV\_ENG 7165. Geographic Information Systems I. 3 Credits.**

Introduces concepts of computer analysis of geographic data and emphasizes the techniques for handling geographic data. Application of computer-based GIS systems in coursework. Prerequisite: instructor's consent; Geography [GEOG] 2840.

**CV\_ENG 7175. The Geospatial Sciences in National Security. 3 Credits.**

(Same as Geography [GEOG] 7130). This course explores the critical contribution of the geospatial sciences in the collection, processing, visualization and analysis of geospatial information related to national security. Prerequisite: Graduate standing required and instructor's consent. May be repeated for credit.

**CV\_ENG 7185. Location Analysis/Site Selection. 3 Credits.**

(Same as Geography [GEOG] 7740). An overview of location analysis in regional planning and spatial decision support, this course focuses on the use of Geographic Information Science (GIS) and location analysis methods in addressing regional service needs. May be repeated for credit. Graduate Standing Required.

**CV\_ENG 7190. Infrastructure Project Development. 3 Credits.**

Students will learn how the key elements of major civil engineering infrastructure projects fit together. The course will focus on the horizontal integration of: financing - planning - environment - right of way - design - construction - operations - maintenance. Engineering is important but so are a lot of other things. Graded on A-F basis only.

**CV\_ENG 7200. Remote Sensing of the Environment. 3 Credits.**

Principles, characteristics and applications of remote sensing in engineering, geosciences, agriculture and environmental projects. Topics: basic concepts, photographic, thermal multispectral and microwave systems, satellite remote sensing and digital image processing. Prerequisites: graduate standing.

**CV\_ENG 7210. Solid Waste Management. 3 Credits.**

Engineering principles involved in generation, handling, collection, transport, processing, and disposal of solid wastes, resource recovery and reuse, legislation on solid wastes and groundwater contamination problems. Prerequisite: graduate standing.

**CV\_ENG 7220. Hazardous Waste Management. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 7220). Engineering principles involved in handling, collection, transportation, processing and disposal of

hazardous wastes, waste minimization, legislation on hazardous wastes and groundwater contamination. Prerequisite: graduate standing.

**CV\_ENG 7230. Introduction to Water Quality. 3 Credits.**

Methods for determining and characterizing water quality, effects of pollution on streams and lakes, and an introduction to engineered systems for the distribution, collection and treatment of water and wastewater. Prerequisite: graduate standing.

**CV\_ENG 7232. Water and Wastewater Treatment Facilities. 3 Credits.**

Physical, chemical, and biochemical processes for treating drinking water supplies and wastewaters (domestic and industrial), with emphasis on planning and design of such facilities. Prerequisites: Civil Engineering [CV\_ENG] 4230/7230 or instructor's consent.

**CV\_ENG 7240. Water Quality Analysis. 3 Credits.**

Chemical, physical and biological methods for analysis of streams, lakes, wastewaters and water supplies and their use in water quality management. Prerequisite: graduate standing and C- or better in Civil Engineering [CV\_ENG] 4230 or instructor's consent.

**CV\_ENG 7250. Environmental Regulatory Compliance. 3 Credits.**

Systems of water law; provisions of major federal environmental laws and regulations; development or regulations at the federal, state, and local levels; regulatory frameworks; permits; and enforcement. Prerequisite: graduate standing.

**CV\_ENG 7260. Environmental Public Policy. 3 Credits.**

Engineering and economic aspects of environmental policy. Basic understanding of environmental statutes and case law. Graduate standing required. Graded on A/F basis.

**CV\_ENG 7270. Environmental Engineering Microbiology. 3 Credits.**

Theory and application of fundamental principles of microbiology, ecology, and aquatic biology of the microorganisms of importance to sanitary engineers. Prerequisite: graduate standing or instructor's consent.

**CV\_ENG 7290. Wastewater Treatment and Process Design. 3 Credits.**

Selection and use of wastewater and sludge treatment processes, disposal methods, leading to rational design of overall wastewater treatment systems. Sustainable wastewater treatment including advanced processes in nutrient removal, anaerobic treatment for wastewater reuse. Prerequisites: graduate standing. Graded on A/F basis only.

**CV\_ENG 7300. Advanced Structural Steel Design. 3 Credits.**

Design of steel structures and bridges. Topics include composite beams, plate girder design, and moment resistant connections. Prerequisite: graduate standing and grade of C- or better in Civil Engineering [CV\_ENG] 3313.

**CV\_ENG 7302. Prestressed/Advanced Reinforced Concrete. 3 Credits.**

Principles of prestressing. Constituent materials, loading and allowable stresses. Working and ultimate stress analysis and design. Shear and torsion. Deflections. Prestress losses. Continuous beams. Composite beams. Compression members. Footings. Co-requisite: graduate standing and Civil Engineering [CV\_ENG] 3312.

**CV\_ENG 7310. Structural Design and Analysis. 3 Credits.**

Design and analysis of building frames and bridges in steel and concrete using case studies. Economic selection of structural type and material. Basic methods of analysis for statically indeterminate structures. Prerequisite: graduate standing and grade of C- or better in Civil Engineering [CV\_ENG] 4300.

**CV\_ENG 7320. Energy Methods in Mechanics. 3 Credits.**

Design of building structures and bridges in steel and reinforced concrete using case studies. Prerequisites: graduate standing and grade of C- or better in Civil Engineering [CV\_ENG] 3300.

**CV\_ENG 7330. Structural System Design. 3 Credits.**

Design of buildings in steel and reinforced concrete, including estimation of loads and design of gravity and lateral force resisting systems. Prerequisite: graduate grade of C- or better in Civil Engineering [CV\_ENG] 3312 and 3313.

**CV\_ENG 7350. Matrix Methods of Structural Analysis. 3 Credits.**

An introduction to the fundamentals of stiffness and flexibility methods for analysis of truss and frame structures. Application of the STRUDL and NASTRAN programs to three dimensional structures. Prerequisite: graduate standing and grade of C- or better in Civil Engineering [CV\_ENG] 3300.

**CV\_ENG 7360. Bridge Engineering. 3 Credits.**

Review of Highway Bridge Analysis and Design Fundamentals. Study of Influence Line Diagrams and shear and Moment Envelopes. Design of medium- and Sort-Span Girder Bridges based on AASHTO LRFD Specs. Prerequisites: Grade of C- or better in Civil Engineering [CV\_ENG] 3312 and 3313. Graded on A/F basis only.

**CV\_ENG 7404. Geotechnical Earthquake Engineering. 3 Credits.**

This course will provide an introduction to topics relating to geotechnical aspects of earthquake engineering. Topics to be covered include; basic seismology, seismic hazard analysis, dynamic soil properties, site response analysis and soil properties, site response analysis and soil liquefaction. Prerequisite: Grade of C- or better in Civil Engineering [CV\_ENG] 3400 or instructor's consent. Graduate standing required. Graded on A/F basis only.

**CV\_ENG 7406. Geotechnics of Landfill Design. 3 Credits.**

This course will focus on geotechnical and construction aspects in the analysis, design and construction of waste containment facilities (landfills) including expansions of existing facilities. Prerequisite: graduate standing and instructor's consent.

**CV\_ENG 7410. Foundation Engineering. 3 Credits.**

Subsurface exploration. Design of basic foundation structures: shallow foundations, retaining walls, deep foundations. Prerequisites: Grade of C- or better in Civil Engineering [CV\_ENG] 3400. Graduate standing required.

**CV\_ENG 7412. Applied Geotechnical Engineering. 3 Credits.**

Study of concepts, theories, and design procedures for modern earthwork engineering including: construction and densification of soils and soil improvement, seepage and drainage, slope stability and performance, and earth retaining structures. Prerequisite: grade of C- or better in Civil Engineering [CV\_ENG] 3400.

**CV\_ENG 7500. Introduction to Construction Management. 3 Credits.**

Structure of the construction industry; construction drawings and specifications; estimating and bidding; construction contracts, bonds and insurance; planning and scheduling of construction operations; project management; computer techniques. Prerequisite: graduate standing.

**CV\_ENG 7510. Construction Methods and Equipment. 3 Credits.**

Selection and use of construction equipment, planning construction operations, equipment economics and operations analyses. Prerequisite: graduate standing and Mathematics [MATH] 1300 or 1500, or instructor's consent.

**CV\_ENG 7600. Advanced Mechanics of Materials. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 7600). Analysis of more complicated problems in stresses, strains. Prerequisite: graduate standing grade of C- or better in Engineering [ENGINR] 2200.

**CV\_ENG 7610. Sensors and Experimental Stress Analysis. 3 Credits.**

Sensors and instrumentation for stress analysis, mechanical measurement and health monitoring of civil structures. Application and design of data acquisition systems, digital signals and basic digital signal processing. Electronics and instrumentation circuits. Prerequisite: Grade of C- or better in Engineering [ENGINR] 2200 and Physics [PHYSICS] 2760.

**CV\_ENG 7660. Vibration Analysis. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 7660). Vibration theory with application to mechanical systems. Prerequisites: graduate standing and grade of C- or better in MAE 2600 and Mathematics [MATH] 4100.

**CV\_ENG 7692. Introduction to Structural Dynamics. 3 Credits.**

Theory of structural response to dynamics loads. Computation of dynamic response of structures to dynamic loads like blast and earthquake. Modal analysis and single degree of freedom methods will be covered. Prerequisites: Grade of C- or better in Civil Engineering [CV\_ENG] 3300. Graded on A/F basis only.

**CV\_ENG 7700. Hydraulics of Open Channels. 3 Credits.**

Gradually varied flow and theory of the hydraulic jump. Slowly varied flow involving storage; rating curves. Prerequisite: graduate standing and Grade of C- or better in Civil Engineering [CV\_ENG] 3700.

**CV\_ENG 7702. Pipeline Engineering. 3 Credits.**

Theoretical and practical aspects of pipeline engineering including pipeline transport of natural gas and various solids such as coal, sand and solid wastes. Prerequisites: graduate standing and Civil Engineering [CV\_ENG] 3700 and Mechanical and Aerospace Engineering [MAE] 3400.

**CV\_ENG 7703. Applied Hydrology. 3 Credits.**

Modern methods of applied hydrologic analysis and synthesis of hydrologic records. Prerequisites: graduate standing and grade of C- or better in Civil Engineering [CV\_ENG] 3700 and 3702, or instructor's consent.

**CV\_ENG 7710. Soil and Water Conservation Engineering. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7150). Urban and rural run-off and erosion analysis. Design and layout of erosion control structures. Prerequisites: Biological Engineering [BIOL\_EN] 3200 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**CV\_ENG 7720. Watershed Modeling Using GIS. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7350). Watershed evaluation using AVSWAT for hydrology, sediment yield, water quality; includes USLE, MUSLE, WEPP. Procedures for model calibration/sensitivity data analysis. Prerequisites: Biological Engineering [BIOL\_EN] 2180 or Civil Engineering [CV\_ENG] 3200 or instructor's consent.

**CV\_ENG 7792. Analysis of Water-Resource Systems. 3 Credits.**

Applies hydrology, hydraulic and sanitary engineering, and economics to water-resource design problems considering man and his environment. Uses methods of systems analysis. Prerequisite: graduate standing and instructor's consent.

**CV\_ENG 8001. Advanced Topics in Civil Engineering. 1-3 Credit.**

New and current technical developments in civil engineering. Prerequisite: Civil Engineering [CV\_ENG] 4006 or equivalent.

**CV\_ENG 8002. Directed Reading In Civil Engineering. 1-3 Credit.**

Faculty supervised readings course, Prerequisite: graduate standing.

**CV\_ENG 8085. Problems in Civil Engineering. 1-6 Credit.**

Supervised investigation in civil engineering to be presented in the form of a report.

**CV\_ENG 8087. Seminar in Civil Engineering. 1 Credit.**

Review of research in progress. Research techniques.

**CV\_ENG 8100. Transportation Planning and Models. 3 Credits.**

Regional and metropolitan transportation studies; land use, traffic generation, distribution and assignment models. Prerequisites: Civil Engineering [CV\_ENG] 4002 or 4003.

**CV\_ENG 8106. Advanced Intelligent Transportation Systems. 3 Credits.**

This course is intended to be an introductory course in Intelligent Transportation Systems (ITS). This course includes the background of ITS, current implementations, sample deployments, and practical issues and implications. Graduate standing required.

**CV\_ENG 8110. Theory of Traffic Flow. 3 Credits.**

Scientific approach to study of traffic phenomena with emphasis on applications. Deterministic and stochastic models of traffic flow; optimization of intersection controls; computer simulation of traffic problems. Prerequisites: Civil Engineering [CV\_ENG] 4002 or instructor's consent.

**CV\_ENG 8120. Traffic Control Engineering. 3 Credits.**

Information retrieval and analysis of human and vehicular characteristics; roadway element; system control and optimization of highways, intersections; planning and design of new traffic facilities including ways, terminals. Prerequisite: Civil Engineering [CV\_ENG] 3110 or equivalent.

**CV\_ENG 8130. Land Use Planning. 3 Credits.**

Case study of site planning using systems analysis; feasibility for development or redevelopment; restraints imposed by political, social and economic conditions on land use activity as related to urban and regional relationships. Prerequisite: Civil Engineering [CV\_ENG] 4106.

**CV\_ENG 8140. Highway Transportation. 3 Credits.**

Economics of transportation on highways. Comparison of vehicle operation costs. Project studies of highway problems in general. Prerequisite: Civil Engineering [CV\_ENG] 4103 or equivalent.

**CV\_ENG 8150. Transportation Networks. 3 Credits.**

This course presents techniques used in equilibrium analysis of transportation networks. The details of traffic assignment algorithms will be discussed along with theory and practical algorithms.

**CV\_ENG 8187. Seminar in Transportation Engineering. 1 Credit.**

Review of research in progress in the area of transportation engineering.

**CV\_ENG 8200. Water Quality Modeling. 3 Credits.**

Derivation and application of models for describing oxygen budget, nutrient exchange, and biological productivity in streams, lakes and estuaries. Prerequisite: Civil Engineering [CV\_ENG] 7230.

**CV\_ENG 8208. Finite Element Methods. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8280).

**CV\_ENG 8210. Groundwater Pollution Evaluation and Modeling. 3 Credits.**

Fundamentals of groundwater hydraulics and groundwater contamination. Use and development of computer models to simulate

flow and pollutant transport. Prerequisites: Civil Engineering [CV\_ENG] 3700, Mathematics [MATH] 4100, or instructor's consent.

**CV\_ENG 8215. Environmental Transport Phenomena. 3 Credits.**

Fundamental processes that control the transport of constituents substances in fluids, and the implications of these processes for a variety of important applications in natural and engineered systems.

**CV\_ENG 8220. Advanced Hazardous Waste Treatment Processes. 3 Credits.**

Course includes some introductory materials about hazardous waste regulations followed by advanced treatment methods such as air stripping, soil-vapor extraction, chemical oxidation, membrane processes, in-situ and ex-situ biotreatment methods, solidification and thermal processes. Prerequisite: Civil Engineering [CV\_ENG] 4220.

**CV\_ENG 8225. Aquatic Chemistry. 3 Credits.**

Principles of chemical thermodynamics and equilibrium applied to processes in natural water and water and wastewater treatment systems. Emphasis on quantitative analyses of acid/base, complexation/dissociation, precipitation/dissolution, and reduction/oxidation reactions. Prerequisites: graduate standing or instructor's consent. Graded on A/F basis only.

**CV\_ENG 8230. Unit Process Laboratory. 3 Credits.**

Studies chemical and physical relationships as applied to unit processes of water and wastewater.

**CV\_ENG 8240. Physiochemical Treatment Processes. 3 Credits.**

Fundamental principles, analysis and modeling of physical and chemical processes for water and wastewater treatment.

**CV\_ENG 8250. Biochemical Treatment Processes. 3 Credits.**

Biochemical principles, kinetic models and energy considerations in the design of biological wastewater treatment processes.

**CV\_ENG 8260. Environmental Biotechnology. 3 Credits.**

Major biochemical reactions relevant to environmental engineering. Theory and application of fundamental principles of attached and suspended microbial growth and process engineering for sanitary engineering and biodegradation. Prerequisite: Civil Engineering [CV\_ENG] 8250 or instructor's consent.

**CV\_ENG 8270. Design of Water and Wastewater Treatment Facilities. 3 Credits.**

Development of design criteria and their application to the design of water and wastewater treatment facilities.

**CV\_ENG 8280. Engineering Aspects of Water Quality. 3 Credits.**

Theoretical aspects of biological, chemical, physical processes; applications in water, wastewater, industrial-waste treatment processes, natural water systems; chemical equilibria, flow models; reaction kinetics on process design, pollutants. Prerequisites: Civil Engineering [CV\_ENG] 4230 or instructor's consent.

**CV\_ENG 8287. Seminar in Environmental Engineering. 1 Credit.**

Review of research in progress in the area of environmental engineering.

**CV\_ENG 8290. Environmental Practicum. 2-4 Credit.**

Application of advanced analysis and design techniques to practical problems in environmental engineering. Collaborative group investigations that may include experimental and computer-aided studies. No more than 6 practicum hours may be applied toward the MS degree. Prerequisite: graduate standing in Civil Engineering. Graded on A/F basis only.

**CV\_ENG 8303. Behavior of Reinforced Concrete Members. 3 Credits.**

The design philosophy, constitutive laws, creep rate sensitivity and aging, shrinkage. Nonlinear response of reinforced concrete members. Deflection computation and control. Bond and anchorage. Prerequisite: Civil Engineering [CV\_ENG] 3312.

**CV\_ENG 8311. Nondestructive Evaluation Engineering. 3 Credits.**

This course will present the interaction of nondestructive evaluation (NDE) technologies and engineering decision-making. Theory and application NDE technologies will be presented in the context of the engineering analysis required to effectively utilize the technologies. Prerequisites: Physics [PHYSICS] 2760, Engineering [ENGINR] 1200, Mathematics [MATH] 4100. Graded on A-F basis only. Graduate Standing Required.

**CV\_ENG 8312. Advanced Structural Analysis. 3 Credits.**

Current trends in structural analysis. Elastic analysis of curved beams, arches and suspensions. Finite element and nonlinear methods of analysis.

**CV\_ENG 8313. Random Vibration. 3 Credits.**

Analysis of random vibrations including topics in stationary, ergodic and nonstationary random processes, with application to single-degree of freedom, discrete and continuous mechanical systems. Prerequisite: Civil Engineering [CV\_ENG] 4606.

**CV\_ENG 8314. Numerical Methods in Engineering. 3 Credits.**

Classification and numerical solution of engineering problems--ordinary and partial differential equations, algebraic equations. Includes initial, boundary, eigen- and characteristic-value problems. Prerequisite: MATH 4100.

**CV\_ENG 8320. Continuum Mechanics. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8320). Introductory course in the mechanics of continuous media. Basic concepts of stress, strain, constitutive relationships; conservation laws are treated using Cartesian tensor notation. Examples from both solid and fluid mechanics investigated. Prerequisites: Civil Engineering [CV\_ENG] 3700, Mathematics [MATH] 7100, Engineering [ENGINR] 2200.

**CV\_ENG 8322. Structural Analysis. 3 Credits.**

Classical and modern methods for elastic analysis. Influence line, Miller-Breslau principle. Introduction to force and displacement methods using matrix analysis. Application to continuous beams, grids, plane and space frames and trusses.

**CV\_ENG 8330. Theory of Elasticity. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8330). Stress and strain at a point. General equations of elasticity. Plane stress, plain strain problems; torsion of prismatic bars. Energy methods.

**CV\_ENG 8332. Design of Special Structures Systems. 3 Credits.**

Reviews current trends in design of structural systems and components. Critical evaluation of recent code modifications. Application to design of light gauge metal structures, lateral bracing systems, curved beams and panel systems. Prerequisite: Civil Engineering [CV\_ENG] 4310 or 4330.

**CV\_ENG 8340. Theory of Plates and Shells. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8340). Rectangular and circular plates. Variational methods in the analysis of plates and shells. Plates of unusual shape. Shear deformation effects. Large deformation analysis. Analysis of cylindrical shells.

**CV\_ENG 8342. Space Mechanics. 3 Credits.**

Rigid body dynamics analysis of satellites, space vehicles. Trajectories, time of flight optimization. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600 or equivalent, and Mathematics [MATH] 4100.

**CV\_ENG 8350. Theory of Elastic Stability. 3 Credits.**

(Same as Mechanical and Aerospace Engineering [MAE] 8350). Buckling of Columns, frames, arches and other structural systems. Kinematic approach to stability. Large deflections. Energy approach to buckling. Plate and shell buckling. Inelastic buckling of columns. Creep buckling.

**CV\_ENG 8360. Theory of Plasticity. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8360). Plastic yield conditions and stress-strain relations. Behavior of elastic-perfectly plastic members. Plain strain in plastic members. Prerequisites: Civil Engineering [CV\_ENG] 8330 or instructor's consent.

**CV\_ENG 8372. Reinforced Concrete Theory and Design. 3 Credits.**

Advanced design of reinforced concrete structures; review of standard codes and specifications and their influence. Prerequisite: Civil Engineering [CV\_ENG] 4350 or equivalent.

**CV\_ENG 8380. Nonlinear Mechanical Analysis. 3 Credits.**

Analysis of behavior of nonlinear mechanical systems. Nonlinear phenomena of importance in mechanical design. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600 or equivalent and Mathematics [MATH] 4100.

**CV\_ENG 8382. Dynamical Theory. 3 Credits.**

Engineering principles and application in mathematical expression of energy, force, inertia system. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600 or equivalent and Mathematics [MATH] 4100.

**CV\_ENG 8387. Seminar in Structural Engineering. 1 Credit.**

Review of research in progress in the area of structural engineering.

**CV\_ENG 8390. Advanced Topics Structural Analysis. 3 Credits.**

Computer implementation and application of finite element analysis. Material and geometric nonlinearities. Plastic analysis of structures. Code provisions for analysis of seismic and wind loadings. Prerequisite: Civil Engineering [CV\_ENG] 4350.

**CV\_ENG 8392. Dynamics of Structures. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8392). Study of the dynamic behavior of structures. Analysis of equivalent lumped parameter systems for the design of structures in a dynamic environment. Prerequisites: MAE 2600 and Mathematics [MATH] 4100/7100.

**CV\_ENG 8402. Advanced Shear Strength of Soils. 3 Credits.**

Theoretical soil mechanics as applied to solution of specific engineering problems.

**CV\_ENG 8403. Consolidation and Settlement. 3 Credits.**

Settlement of soil, Theory of Consolidation, consolidation testing, settlements of earth fills and embankments, stress distribution in soils, elastic settlement, bearing capacity of shallow foundations, shallow foundations design. Prerequisite: Civil Engineering [CV\_ENG] 3400.

**CV\_ENG 8404. Seepage in Soils. 3 Credits.**

General principles that govern flow of water through soils and specific procedures for analysis and design of filtration and drainage media in geotechnical and geoenvironmental applications. Prerequisite: Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 8406. Unsaturated Soil Mechanics. 3 Credits.**

Fundamental principles governing the strength, deformation, and fluid flow behavior of multiphase porous media. Includes specific procedures

for analyzing, measuring and modeling strength, hydraulic conductivity, and suction characteristics of unsaturated soil. Prerequisite: Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 8407. Soil Behavior. 3 Credits.**

Detailed study of composition, fabric, and geotechnical and hydrologic properties of soils that consist partly or wholly of clay. Emphasizes physico-chemical factors governing volume change and shear strength. Expansive clay behavior is examined in detail. Prerequisite: Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 8408. Soil Dynamics. 3 Credits.**

Cover topics relating to the response of soils to dynamic loading. Topics to be covered include: lab and field methods, cyclic soil models, foundation vibrations, and wave propagation through soil. Prerequisite: Civil Engineering [CV\_ENG] 3400 and instructor's consent. Graded on A/F basis only.

**CV\_ENG 8410. Advanced Foundation Engineering. 3 Credits.**

Foundation design beyond simple spread footings, special footings and beams on an elastic foundations, mat foundations, pile foundations - static capacity, lateral loads, bucklin, dynamic analysis load tests, pile groups, drilled piers. Prerequisite: Civil Engineering [CV\_ENG] 4410.

**CV\_ENG 8412. Stability and Performance of Earth Slopes. 3 Credits.**

Principles, mechanics and procedures for analyzing the stability of earth slopes and landfills under short-term, long-term, rapid drawdown, and earthquake conditions. Prerequisite: Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 8413. Design and Analysis of Earth Retaining Structures. 3 Credits.**

General principals and specific procedures for analysis and design of earth retention systems including consideration of soil-structure interaction. Prerequisite: Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 8420. Advanced Geotechnics. 3 Credits.**

Advanced study of specific geotechnical engineering topics. Topics may include: Environmental Geotechnics, Landfill Design, Geosynthetics, Laboratory Testing, and Case History. May be repeated for credit when topics vary. Prerequisite: Civil Engineering [CV\_ENG] 3400 or instructor's consent.

**CV\_ENG 8487. Seminar in Geotechnical Engineering. 1 Credit.**

Review of research in progress in the area of geotechnical engineering.

**CV\_ENG 8510. Construction Engineering. 3 Credits.**

Selection and layout of construction plant. Design and construction of formwork, falsework, cofferdams, conveyors and other temporary structures used by contractors. Prerequisite: Civil Engineering [CV\_ENG] 4510 or equivalent.

**CV\_ENG 8520. Construction Productivity. 3 Credits.**

Work improvement techniques in the construction industry reviewed and applied to local construction site. Construction safety influenced by supervisors and managers studied in detail. Declining productivity in the construction industry evaluated and solutions considered. Prerequisite: Civil Engineering [CV\_ENG] 4500.

**CV\_ENG 8530. Construction Project Management. 3 Credits.**

Cost analysis, estimating techniques. Time, cost, and quality control of construction projects. Recording/analyzing construction effort. Applications of crew balance, process charts, time-lapse motion pictures, operations research, and preplanning techniques to construction operations. Construction safety.



**CV\_ENG 8540. Construction Administration. 3 Credits.**

Organization, management, engineering, business, and legal problems in the construction industry. Purchasing, bonding, insurance, financing, labor relations, and contract administration. Prerequisite: Civil Engineering [CV\_ENG] 4500.

**CV\_ENG 8610. Materials and Measurement. 3 Credits.**

About 25% of the course is devoted to the physical measurement of strain, force, displacement and motion. Remainder of course is devoted to advanced study of the behavior of steel and concrete with emphasis on brittle fracture in steel. Prerequisites: Civil Engineering [CV\_ENG] 3600 or equivalent.

**CV\_ENG 8620. Advanced Dynamics. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8620). Fundamental principles of advanced rigid body dynamics with applications. Special mathematical techniques including Lagrangian and Hamiltonian methods. Prerequisites: Civil Engineering [CV\_ENG] 2080 and Mathematics [MATH] 4100.

**CV\_ENG 8630. Vibrations of Distributed Parameter Systems. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 8630). Vibration analysis of strings, cables, bars, rods, shafts, beams, membranes, plates, circular rings, frames; free and forced oscillation; miscellaneous loading; various boundary conditions; effect of damping; energy methods; method of difference equations. Prerequisite: Civil Engineering [CV\_ENG] 4660.

**CV\_ENG 8710. Advanced Hydraulic Engineering. 3 Credits.**

Unsteady flow in pipes and open channels is studied using the method of characteristics and finite difference equations. Hydraulic transient in pipe networks due to valve adjustments, pump startup and pump power failure are analyzed. Control of transient using surge tanks and air chambers is included. Prerequisite: Civil Engineering [CV\_ENG] 3720.

**CV\_ENG 8720. Hydrotechnical Practicum. 2-4 Credit.**

Application of advanced analysis and design techniques to practical problems in hydrotechnical engineering. Collaborative group investigations that may include experimental and computer aided studies. No more than 6 practicum hours may be applied toward the MS degree. Prerequisite: graduate standing in Civil Engineering. Graded on A/F basis only.

**CV\_ENG 8730. Fundamentals of Fluid Mechanics. 3 Credits.**

Treatment of fundamental concepts and theories in fluid mechanics at a level suitable for beginning graduate students. Prerequisites: Civil Engineering [CV\_ENG] 3700 or equivalent.

**CV\_ENG 8740. Hydrodynamics. 3 Credits.**

Special topics in potential theory and conformal mapping.

**CV\_ENG 8750. Wind Engineering. 3 Credits.**

Study of wind effects on the safety of engineering structures, air pollution and building energy consumption, and the use of wind. Prerequisite: Civil Engineering [CV\_ENG] 3700.

**CV\_ENG 8990. Research-Masters Thesis in Civil & Environmental Engineering. 1-99 Credit.**

Independent investigation in the field of civil engineering to be presented in the form of a thesis. Graded on a S/U basis only.

**CV\_ENG 9001. Advanced Topics in Civil Engineering - PhD. 1-4 Credit.**

New and current technical developments in civil engineering. For PhD students.

**CV\_ENG 9990. Research-Doctoral Dissertation Civil & Environmental Engineering. 1-99 Credit.**

Independent investigation in the field of civil engineering to be presented in the form of a thesis. Graded on a S/U basis only.

## Classical Humanities (CL\_HUM)

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**CL\_HUM 1050. Greek and Latin in English. 3 Credits.**

A survey of the influence of Greek and Latin upon English literary, scientific, technical, legal and medical vocabulary. Emphasis is upon building competency with complex English words while studying the cultural influence of the classical languages on modern vocabulary.

**CL\_HUM 1060. Classical Mythology. 3 Credits.**

Myths of Greece and Rome in literature and art.

**CL\_HUM 1060H. Classical Mythology - Honors. 3 Credits.**

Myths of Greece and Rome in literature and art. Honors eligibility required.

**CL\_HUM 2005. Topics in Classical Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester.

**CL\_HUM 2100. Greek Culture. 3 Credits.**

Survey of Greek life and thought. Principal developments in literature, the arts, politics, religion and philosophy, and their influence on Western civilization.

**CL\_HUM 2100H. Greek Culture - Honors. 3 Credits.**

Survey of Greek life and thought. Principal developments in literature, the arts, politics, religion and philosophy, and their influence on Western civilization. Honors eligibility required.

**CL\_HUM 2200. Roman Culture. 3 Credits.**

Survey of Roman life and thought. Principal developments in literature, the arts, politics, religion, philosophy, and private life, and their influence on Western Civilization.

**CL\_HUM 2300. Greek Classics in Translation. 3 Credits.**

Reading in translation and critical study of the most important literary works of the ancient Greek World.

**CL\_HUM 2300H. Greek Classics in Translation. 3 Credits.**

Reading in translation and critical study of the most important literary works of the ancient Greek world. Honors eligibility required.

**CL\_HUM 2400. Roman Classics in Translation. 3 Credits.**

Reading in translation and critical study of the most important literary works of the ancient Roman world.

**CL\_HUM 2940. Service Learning in Classical Studies. 1 Credit.**

Students provide enrichment programming on the Ancient World at various Columbia Public School sites. Participants must be Classical Studies majors or minors. Graded on A/F basis only. Does not meet Arts and Science general education requirements. Prerequisites: instructor's consent required.

**CL\_HUM 3000. Foreigners and Dangerous Women in Greek and Latin Literature. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3130). The study of how Greek and Roman writers depicted and reacted to other races and cultures, compared them with their own, and thereby revealed their own values and prejudices.

**CL\_HUM 3000H. Foreigners and Dangerous Women in Greek and Latin Literature - Honors. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3130). The study of how Greek and Roman writers depicted and reacted to other races and cultures, compared them with their own, and thereby revealed their own values and prejudices. Honors eligibility required.

**CL\_HUM 3005. Topics in Classical Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: Classical Humanities [CL\_HUM] 1060, any Classical Humanities [CL\_HUM] 2000 course, or instructor's consent.

**CL\_HUM 3005H. Topics in Classical Humanities - Honors. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: Classical Humanities [CL\_HUM] 1060, any Classical Humanities [CL\_HUM] 2000 course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3050. Philosophy Before Socrates. 3 Credits.**

A study of the origin of philosophical thinking in the Ancient Greek world. Topics to be explored include the nature of reality and our knowledge of it, the structure and constituents of the cosmos, human excellence and its relation to morality, political power, and happiness. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any CL\_HUM 2000 level course or instructor's consent.

**CL\_HUM 3050H. Philosophy Before Socrates - Honors. 3 Credits.**

A study of the origin of philosophical thinking in the Ancient Greek world. Topics to be explored include the nature of reality and our knowledge of it, the structure and constituents of the cosmos, human excellence and its relation to morality, political power, and happiness. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any CL\_HUM 2000 level course or instructor's consent. Honors eligibility required.

**CL\_HUM 3100. The Age of Pericles. 3 Credits.**

A study of the literature and culture of the 5th and early 4th centuries B.C. in Athens. Authors will include Thucydides, Herodotus, Xenophon, Plato, Aristotle, the tragedians and Aristophanes. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities [CL\_HUM] 2000 level course, or instructor's consent.

**CL\_HUM 3100H. The Age of Pericles - Honors. 3 Credits.**

A study of the literature and culture of the 5th and early 4th centuries B.C. in Athens. Authors will include Thucydides, Herodotus, Xenophon, Plato, Aristotle, the tragedians and Aristophanes. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities [CL\_HUM] 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3150. The Age of Augustus. 3 Credits.**

Study of the literature of the Age of Augustus; Vergil, Ovid, Horace, Livy, and Propertius. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities [CL\_HUM] 2000 level course, or instructor's consent.

**CL\_HUM 3150H. The Age of Augustus - Honors. 3 Credits.**

Study of the literature of the Age of Augustus; Vergil, Ovid, Horace, Livy, and Propertius. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities [CL\_HUM] 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3200. Power and Oratory in Ancient Greece. 3 Credits.**

Concentrates on the rise of oratory in Greece and how oratory was exploited for political ends. Special attention will be paid to the Athenian

Democracy in the fifth and fourth centuries BC. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities [CL\_HUM] 2000 level course.

**CL\_HUM 3200H. Power and Oratory in Ancient Greece - Honors. 3 Credits.**

Concentrates on the rise of oratory in Greece and how oratory was exploited for political ends. Special attention will be paid to the Athenian Democracy in the fifth and fourth centuries BC. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities [CL\_HUM] 2000 level course. Honors eligibility required.

**CL\_HUM 3225. Roman Comedy, Wit and Humor. 3 Credits.**

Study of works illustrating the comedy, wit and humor of the Romans: readings in comedies of Plautus and Terence, Catullus, Ovid's *Metamorphoses*, Petronius' *Satyricon*, Martial, Juvenal and Macrobius. Prerequisites: Classical Humanities [CL\_HUM] 1060, any Classical Humanities 2000 level course or instructor's permission.

**CL\_HUM 3250. Greek and Roman Epic. 3 Credits.**

A study of the major representatives of the ancient epic genre. Readings will include Homer's *Iliad* and *Odyssey*, Apollonius' *Argonautica*, Vergil's *Aeneid*. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3250H. Greek and Roman Epic - Honors. 3 Credits.**

A study of the major representatives of the ancient epic genre. Readings will include Homer's *Iliad* and *Odyssey*, Apollonius' *Argonautica*, Vergil's *Aeneid*. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3300. Greek Drama. 3 Credits.**

Reading and interpretation of Greek tragedies and comedies in translation. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3300H. Greek Drama - Honors. 3 Credits.**

Reading and interpretation of Greek tragedies and comedies in translation. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3350. Advanced Mythology. 3 Credits.**

Interpretation of selected classical myths and their influence on later literature and art. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3350H. Advanced Mythology - Honors. 3 Credits.**

Interpretation of selected classical myths and their influence on later literature and art. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3400. Murder and Mayhem: Images of Justice in Classical Antiquity. 3 Credits.**

Ideas of justice from Homer through the early Roman Empire; personal vengeance, law courts and trials, philosophical attitudes, women and courts, techniques of persuasion. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3400H. Murder & Mayhem: Images of Justice in Classical Antiquity - Honors. 3 Credits.**

Ideas of justice from Homer through the early Roman Empire; personal vengeance, law courts and trials, philosophical attitudes, women and

courts, techniques of persuasion. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3450. Greek and Roman Characters and Ideals. 3 Credits.**  
Study of selected types of characters admired and imitated or hated and rejected in classical antiquity; heroes, philosophers, women. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3450H. Greek and Roman Characters and Ideals - Honors. 3 Credits.**  
Study of selected types of characters admired and imitated or hated and rejected in classical antiquity; heroes, philosophers, women. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3550. War and Democracy in Late 5th c. BCE Athens. 3 Credits.**  
(same as Peace Studies [PEA\_ST] 3550). Explores the discourse on war and peace in Athenian texts and art that survives from the last quarter of the 5th century B.C.E. This was a period of relentless warfare: the Athenians were fighting the Spartans, Sparta's allies, unaligned cities and several of their own subject states. Prerequisite: any 2000 level Classical Humanities [CL\_HUM] course.

**CL\_HUM 3600. The Ancient Novel. 3 Credits.**  
Reading and analysis of Greek and Latin prose fiction: ideal and comic romance, fantasy, romantic biography; Hellenistic background. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3600H. The Ancient Novel - Honors. 3 Credits.**  
Reading and analysis of Greek and Latin prose fiction: ideal and comic romance, fantasy, romantic biography; Hellenistic background. Prerequisite: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3650. Paganism and Christianity. 3 Credits.**  
A study of the transition from Paganism to Christianity in the Roman Empire, as seen by observers contemporary with the events. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3650H. Paganism and Christianity - Honors. 3 Credits.**  
A study of the transition from Paganism to Christianity in the Roman Empire, as seen by observers contemporary with the events. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3700. Women in the Ancient World. 3 Credits.**  
Using classical literary texts as the central focus this course examines the role of women: the conflict inherent in their obligations and their identity in the context of these obligations. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3700H. Women in the Ancient World - Honors. 3 Credits.**  
Using classical literary texts as the central focus this course examines the role of women: the conflict inherent in their obligations and their identity in the context of these obligations. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3750. Classics in a Cross-Cultural Context. 3 Credits.**  
The goal of this course is to place classical literature in a multicultural context by studying Greek and Latin literary texts alongside verbal art from non-European as well as European cultures. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 3750H. Classics in a Cross-Cultural Context - Honors. 3 Credits.**  
The goal of this course is to place classical literature in a multicultural context by studying Greek and Latin literary texts alongside verbal art from non-European as well as European cultures. Prerequisites: Classical Humanities [CL\_HUM] 1060 or any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 3775. The Ancient World on Film. 3 Credits.**  
(same as AR\_H\_A 3775 and FILM\_S 3775). This course explores how classical antiquity has been represented in twentieth and twenty-first-century film, with particular emphasis on the ways in which ancient narratives and iconography have been appropriated by filmmakers to address contemporary cultural issues. Prerequisite: Prior 2000 level coursework in CL\_HUM, AR\_H\_A, or FILM\_S. Instructor's consent required.

**CL\_HUM 3800. Sports and Spectacles in Greco-Roman Antiquity. 3 Credits.**  
Investigates athletic display in ancient Greek and Roman culture, from its earliest representations in Greek literature to the massive spectacles of the Roman empire, with an emphasis on the intersections between sport and spectacle and other areas of ancient cultural life. Prerequisites: Classical Humanities [CL\_HUM] 1060 and 2100 or 2200. Instructor's consent required.

**CL\_HUM 4005. Topics in Classical Humanities. 1-99 Credit.**  
Subjects and earnable credit may vary from semester to semester. Prerequisites: Any Classical Humanities 2000 level course or instructor's consent.

**CL\_HUM 4100. Greece: From the Bronze Age to the Byzantine Empire. 6 Credits.**  
Study abroad in Greece, in conjunction with the MU International Center. Immersion in the physical and intellectual heritage of ancient Greece; emphasis on cross-disciplinary, on-site learning and the intersections among ancient, Byzantine, and modern Greece. Application required. Prerequisite: Any 2000 level or higher course in the Department of Classical Studies (courses on similar subjects in other departments accepted as equivalent); 2.75 overall GPA, Instructor Consent, and Application through MU International Center required. Participants chosen by instructor. Graded on A/F basis only.

**CL\_HUM 4100H. Greece: From the Bronze Age to the Byzantine Empire - Honors. 6 Credits.**  
Study abroad in Greece, in conjunction with the MU International Center. Immersion in the physical and intellectual heritage of ancient Greece; emphasis on cross-disciplinary, on-site learning and the intersections among ancient, Byzantine, and modern Greece. Participants chosen by instructor. Graded on A/F basis only. Application required. Prerequisite: Any 2000 level or higher course in the Department of Classical Studies (courses on similar subjects in other departments accepted as equivalent); 2.75 overall GPA, Instructor Consent, and Application through MU International Center required. Honors eligibility required.

**CL\_HUM 4500. Greek and Roman Religion. 3 Credits.**

(same as Religious Studies [REL\_ST] 4500). Survey of religious development among the Greeks and Romans. Prerequisite: Classical Humanities [CL\_HUM] 1060 or Art History and Archaeology [AR\_H\_A] 1110 or History [HIST] 1520; sophomore standing.

**CL\_HUM 4500H. Greek and Roman Religion - Honors. 3 Credits.**

(same as Religious Studies [REL\_ST] 4500). Survey of religious development among the Greeks and Romans. Prerequisite: Classical Humanities [CL\_HUM] 1060 or Art History and Archaeology [AR\_H\_A] 1110 or History [HIST] 1520; sophomore standing. Honors eligibility required.

**CL\_HUM 4550. Literature and Culture of the Hellenistic Age. 3 Credits.**

A survey of the literature and culture of the Hellenistic Age. Prerequisites: any Classical Humanities 2000 level course, or instructor's consent.

**CL\_HUM 4550H. Literature and Culture of the Hellenistic Age - Honors. 3 Credits.**

A survey of the literature and culture of the Hellenistic Age. Prerequisites: any Classical Humanities 2000 level course, or instructor's consent. Honors eligibility required.

**CL\_HUM 4600. The Classical Tradition. 3 Credits.**

Selected studies in continuity and influence of Greek and Roman culture on Middle Ages, Renaissance, and modern times. Prerequisite: any Classical Humanities 2000 level course or instructor's consent.

**CL\_HUM 4600H. The Classical Tradition - Honors. 3 Credits.**

Selected studies in continuity and influence of Greek and Roman culture on Middle Ages, Renaissance, and modern times. Prerequisite: any Classical Humanities 2000 level course or instructor's consent. Honors eligibility required.

**CL\_HUM 4650. The World of Late Antiquity. 3 Credits.**

A survey of the literature, culture, and history of the late Roman and early Byzantine periods. Attention to Christianity's development and the transformation of the classical heritage. Prerequisites: any Classical Humanities 2000 level or instructor's consent.

**CL\_HUM 4650H. The World of Late Antiquity - Honors. 3 Credits.**

A survey of the literature, culture, and history of the late Roman and early Byzantine periods. Attention to Christianity's development and the transformation of the classical heritage. Prerequisites: any Classical Humanities 2000 level or instructor's consent. Honors eligibility required.

**CL\_HUM 4770. Oral Tradition. 3 Credits.**

(same as English [ENGLSH] 4770). Study of verbal art from living oral traditions (e.g. Native American and African American) and important literary works with roots in oral tradition (e.g. the Bible, the Iliad and Odyssey, and Beowulf). Prerequisite: junior standing and instructor's consent.

**CL\_HUM 4770H. Oral Tradition - Honors. 3 Credits.**

(same as English [ENGLSH] 4770). Study of verbal art from living oral traditions (e.g. Native American and African American) and important literary works with roots in oral tradition (e.g. the Bible, the Iliad and Odyssey, and Beowulf). Prerequisite: junior standing and instructor's consent. Honors eligibility required.

**CL\_HUM 4970. Capstone in Classical Humanities. 3 Credits.**

Culminating course in the study of Greek and Roman literature and Classical Culture. Required for Classical Humanities majors in first term of senior year. Recommended for Classical Humanities double-majors. Prerequisite: instructor's consent.

**CL\_HUM 4970H. Capstone in Classical Humanities- Honors. 3 Credits.**

Culminating course in the study of Greek and Roman literature and Classical Culture. Required for Classical Humanities majors in first term of senior year. Recommended for Classical Humanities double-majors. Prerequisite: instructor's consent; Honors eligibility required.

**CL\_HUM 7005. Topics in Classical Humanities. 1-99 Credit.**

Subjects and earnable credit may vary from semester to semester. Prerequisites: any Classical Humanities [CL\_HUM] 3000 level course or instructor's consent. Prerequisite: graduate standing.

**CL\_HUM 7550. Literature and Culture of the Hellenistic Age. 3 Credits.**

A survey of the literature and culture of the Hellenistic Age. Graded on A/F basis only. Graduate standing required.

**CL\_HUM 7650. The World of Late Antiquity. 3 Credits.**

A survey of the literature, culture, and history of the late Roman and early Byzantine periods. Attention to Christianity's development and the transformation of the classical heritage. Graduate standing required.

## Classics (CLASS)

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**CLASS 4100. History of the Greek and Latin Languages. 3 Credits.**

(same as Linguistics [LINGST] 4130). Evolution of classical languages and their relationship to each other.

**CLASS 4205. Topics in Classical Studies. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition.

**CLASS 4300. Introduction to Text Criticism and Paleography. 3 Credits.**

Latin and/or Greek textual criticism and paleography, using manuscript facsimiles at the University library. Prerequisite: 2 years of Greek or Latin or equivalent.

**CLASS 4400. Ancient Pastoral. 3 Credits.**

Reading and interpretation of pastoral poetry and prose in Greek and Latin; emphasis on Theocritus, Virgil, and Longus. Prerequisite: 2 years each of Greek and Latin.

**CLASS 4700. Advanced Study in the Teaching of the Classics. 3 Credits.**

Prerequisites: classroom teaching experience or chairman's consent.

**CLASS 4960. Special Readings in Classical Studies. 1-3 Credit.**

Readings in authors and texts not covered in other courses. Prerequisite: departmental consent.

**CLASS 4970. Capstone in Classical Languages. 3 Credits.**

Culminating course in the study of Greek and Roman literature and Classical culture. Required for Greek, Latin, and Classical Languages majors in first term of senior year. Recommended for double-majors. Prerequisites: 2 years classical Greek, or Latin, or equivalent; junior standing; departmental consent.

**CLASS 4970H. Capstone in Classical Languages. 3 Credits.**

Culminating course in the study of Greek and Roman literature and Classical culture. Required for Greek, Latin, and Classical Languages majors in first term of senior year. Recommended for double-majors.

Prerequisites: 2 years classical Greek, or Latin, or equivalent; junior standing; departmental consent. Honors eligibility required.

**CLASS 4995H. Honors Proseminar in Classical Studies. 3-6 Credit.**  
Limited to Honors undergraduates. To be taken in senior year. Integrated exploration of classical civilization. May repeat to 6 hours maximum. Prerequisite: limited to Honors undergraduates, to be taken in senior year. Honors eligibility required.

**CLASS 7000. Introduction to Graduate Study in Classics. 1 Credit.**  
Required of all first-year graduate students.

**CLASS 7100. History of the Greek and Latin Languages. 3 Credits.**  
(same as Linguistics [LINGST] 7130). Evolution of classical languages and their relationship to each other. Prerequisite: graduate standing.

**CLASS 7205. Topics in Classical Studies. 1-99 Credit.**  
Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: graduate standing and departmental consent for repetition.

**CLASS 7300. Introduction to Text Criticism and Paleography. 3 Credits.**  
Latin and/or Greek textual criticism and paleography, using manuscript facsimiles at the University library. Prerequisite: graduate standing and 2 years of Classical Languages or equivalent.

**CLASS 7400. Ancient Pastoral. 3 Credits.**  
Reading and interpretation of pastoral poetry and prose in Greek and Latin; emphasis on Theocritus, Virgil, and Longus. Prerequisite: graduate standing and 2 years each of Greek and Latin.

**CLASS 7700. Advanced Study in the Teaching of the Classics. 3 Credits.**  
Prerequisites: graduate standing and classroom teaching experience or chairman's consent.

**CLASS 7960. Special Readings in Classical Studies. 1-3 Credit.**  
Readings in authors and texts not covered in other courses. Prerequisite: graduate standing and classics/classical humanities--departmental consent; Greek--two years classical Greek or equivalent; Latin--two years Classical Latin or equivalent.

**CLASS 8085. Directed Readings in Classics. 3 Credits.**  
For graduate students to undertake special projects for graduate credit under the supervision of faculty. Prerequisite: graduate standing.

**CLASS 8090. Masters Research and Thesis in Classics. 3 Credits.**  
For graduate students studying for the MA and working on a thesis to receive credit for work directly related to the thesis. Graded S/U only.

**CLASS 8440. Ancient/Medieval Topography. 1-99 Credit.**  
(same as Art History and Archeology [AR\_H\_A] 8440). Descriptive and historical analysis of selected city or site. Subject varies. Prerequisite: instructor's consent.

**CLASS 9090. PhD Research and Thesis. 1-8 Credit.**  
Individual research in preparation for writing thesis and/or dissertation. Graded on a S/U basis only.

**CLASS 9187. Seminar in Classical Mythology. 3 Credits.**  
Intensive study of classical mythology in origin, development, meaning and influence. Prerequisite: instructor's consent.

**CLASS 9287. Seminar in the Hellenistic Age. 3-6 Credit.**  
Prerequisite: graduate standing.

**CLASS 9387. Seminar in Ancient Rhetoric and Oratory. 3 Credits.**  
Prerequisite: graduate standing.

**CLASS 9487. Seminar in Ancient Literary Criticism. 3 Credits.**  
Principles and theories of ancient Greek and Latin literary criticism, as developed in significant works on the subject. Prerequisite: graduate standing.

**CLASS 9587. Greco-Roman Didactic. 3-6 Credit.**  
Critical and comparative study of Greek and Latin didactic poetry with emphasis on major authors from Hesiod through the Augustan Age. Prerequisite: graduate standing.

**CLASS 9687. Seminar in Greco-Roman Religion. 3 Credits.**  
Prerequisite: graduate standing.

**CLASS 9787. Seminar in Greco-Roman Satire and Social Criticism. 3 Credits.**  
Prerequisite: graduate standing.

**CLASS 9887. Seminar in the Age of the Antonines. 3-6 Credit.**  
Prerequisite: graduate standing.

## Clinical Laboratory Sciences (CL\_L\_S)

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**CL\_L\_S 1000. Orientation to Clinical Laboratory Science. 1 Credit.**  
The class is designed to give prospective Clinical Laboratory Science students clinical experience in the field of Clinical Laboratory Science. Prerequisite: Health Professions [HTH\_PR] 1000. Graded on S/U basis only.

**CL\_L\_S 4412. Clinical Laboratory Science Theory, Application and Correlation. 5 Credits.**  
Application, evaluation and correlation of laboratory procedures used in the diagnosis and treatment of common disease states. Opportunities for building critical thinking, problem solving, and leadership skills are provided in small group clinical case discussions. Prerequisites: departmental approval, accepted into the Medical Technology Program. Course may be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4414. Chemistry I. 1-4 Credit.**  
Introduction to theory, practical application, technical performance and evaluation of clinical chemistry laboratory procedures. Prerequisites: departmental consent, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4415. Chemistry II. 3 Credits.**  
Advanced theory, practical application, technical performance and evaluation of clinical chemistry laboratory procedures. Prerequisites: departmental consent, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4416. Clinical Hematology I. 1-4 Credit.**  
Introduction to the theory, practical application, technical performance and evaluation of hematological and coagulation procedures. Emphasis on correlations of clinical laboratory data with the diagnosis and treatment of anemia, leukemia, and bleeding/clotting disorders. Prerequisites: departmental consent, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4417. Clinical Hematology II. 3 Credits.**  
Advanced theory, practical application, technical performance and evaluation of hematological and coagulation procedures. Emphasis on

the correlation of clinical laboratory data with the diagnosis and treatment of anemia, leukemia, and bleeding/clotting disorders. Prerequisites: departmental consent, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4418. Clinical Microbiology I. 1-4 Credit.**

Introduction to the theory, practical application, technical performance and evaluation of procedures for isolation, identification and susceptibility testing of infectious disease organisms in humans. Prerequisites: departmental approval, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4419. Clinical Microbiology II. 3 Credits.**

Advanced theory, practical application, technical performance and evaluation procedures for isolation, identification and susceptibility testing of infectious disease in humans; bacteriology, mycology, parasitology, virology and serology and correlation of data with diagnosis and treatment. Prerequisites: departmental approval, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4420. Clinical Immunology. 1 Credit.**

Theory, practical application, and evaluation of immunological components; principles and methods used to assess immunologically-related disorders, including hypersensitivity reactions, autoimmune, immunoproliferative and immunodeficiency disorders, tumors and transplantations. Prerequisites: departmental approval, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4422. Immunohematology I. 1-4 Credit.**

Introduction to the theory, practical application, technical performance and evaluation of blood bank procedures required for transfusion of blood and blood components and for handling and storage of blood and blood components. Prerequisites: departmental approval, accepted into the Medical Terminology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4423. Immunohematology II. 2 Credits.**

Advanced theory, practical application, technical performance and evaluation of blood bank procedures required for transfusion of blood and blood components and for handling and storage of blood and blood components. Prerequisites: departmental approval, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4424. Phlebotomy. 1 Credit.**

Theory, practical application, technical performance and evaluation of procedures used in collecting, handling and processing blood specimens. Prerequisites: departmental approval, accepted into the Medical Technology Program. May be repeated for credit. Graded on S/U basis only.

**CL\_L\_S 4426. Body Fluid Analysis. 1 Credit.**

Theory, practical application, technical performance and evaluation of procedures used in the analysis of urine and other body fluids, including cerebrospinal, synovial, serous, seminal, amniotic and feces. Prerequisites: departmental consent, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4970. Clinical Laboratory Management I. 2 Credits.**

Theory, practical application and evaluation of laboratory management principles and associated models in communication, educational

methodology, healthcare systems and financial resources. Opportunities for building critical thinking, problem-solving, and management/professional leadership skills are provided. Prerequisite: departmental approval, accepted into the Medical Technology Program. May be repeated for credit. Graded on A/F basis only.

**CL\_L\_S 4980. Clinical Lab Management II. 3 Credits.**

Continuation of Clinical Lab Management I. Theory, practical application, and evaluation of laboratory management principles and associated models in compliance and regulatory issues, human resource management, method evaluation, professionalism and laboratory quality. Prerequisite: Clinical Laboratory Sciences [CL\_L\_S] 4970 or departmental consent; accepted into the Medical Technology Program. Graded on A/F basis only.

## Communication (COMMUN)

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**COMMUN 1200. Public Speaking. 3 Credits.**

Principles, process of speech communication in small group and public speaking situations. Three lab/lecture meetings per week.

**COMMUN 1200H. Public Speaking - Honors. 3 Credits.**

Principles, process of speech communication in small group and public speaking situations. Three lab/lecture meetings per week. Honors eligibility required.

**COMMUN 2100. Media Communication in Society. 3 Credits.**

An introduction to the development and impact of media communications and its technologies on American society. Emphasis on contemporary industry developments, their historical antecedents, as well as contemporary issues related to the influence and impact of media communication on society. Prerequisite: freshman, sophomore or junior standing only.

**COMMUN 2100H. Media Communication in Society - Honors. 3 Credits.**

An introduction to the development and impact of media communications and its technologies on American society. Emphasis on contemporary industry developments, their historical antecedents, as well as contemporary issues related to the influence and impact of media communication on society. Prerequisite: freshman, sophomore or junior standing only. Honors eligibility required.

**COMMUN 2315. Basic Audio Production and Performance. 3 Credits.**

Radio speaking in varied types of programs; console operations, tape editing, microphone techniques. May be restricted to Communication majors only during early registration.

**COMMUN 2701. Topics in Communication - General. 3 Credits.**

Topics in Communication - General. May be restricted to Communication majors only during early registration.

**COMMUN 2703. Topics in Communication - Behavioral Science. 3 Credits.**

Topics in Communication - Behavioral Science. May be restricted to Communication majors only during early registration.

**COMMUN 2705. Topics in Communication - Humanities/Fine Arts. 3 Credits.**

Topics in Communication - Humanities/Fine Arts. May be restricted to Communication majors only during early registration.

**COMMUN 3050. Survey of Communication Studies. 3 Credits.**

A survey of four main areas of the field communication, interpersonal, organizational, political, and mass communication. May be restricted to Communications majors through early registration.

**COMMUN 3310. Message Design and Writing for the Media. 3 Credits.**

Styles and functions of various script formats for radio, television productions. Prerequisites: Communication [COMMUN] 2100. May be restricted to Communication majors only during early registration.

**COMMUN 3315. Advanced Audio Production. 3 Credits.**

The study and application of techniques applicable to radio, television, and multimedia production with an emphasis on digital audio workstation systems. Prerequisite: Communication [COMMUN] 2315. May be restricted to Communication majors only during early registration.

**COMMUN 3390. Digital Production I. 3 Credits.**

Focus on building familiarity with video cameras, microphones, lighting, editing as well as the fundamentals of visual composition, (framing, camera angles, story boards, and ways to visualize information) and processes and procedures for producing and directing. Prerequisite: sophomore standing. May be restricted to Communication majors only during early registration.

**COMMUN 3395. Digital Production II. 3 Credits.**

Focus on advanced production work; more elaborate projects including digital shorts, music videos, and short documentaries; advanced editing, storyboards, and emphasis on developing narrative structure. Prerequisite: Communication [COMMUN] 3390 or instructor's consent. May be restricted to Communication majors only during early registration.

**COMMUN 3422. Communication Research Methods. 3 Credits.**

Focuses on writing and administering surveys, conducting field research, and designing experimental studies. Prerequisites: sophomore standing and Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 3441. Nonverbal Communication. 3 Credits.**

Analysis of form and content of nonverbal communication. Emphasis on role of nonverbal cues in interpersonal communication. Prerequisite: sophomore standing and Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 3460. Organizational Advocacy. 3 Credits.**

Theory and analysis of communication to promote organizational culture and image. Prerequisite: sophomore standing. May be restricted to Communication majors during early registration.

**COMMUN 3470. Culture as Communication. 3 Credits.**

(same as Anthropology [ANTHRO] 3470, Linguistics [LINGST] 3470). Study of the influence of culture on communication processes. Examines topics such as the impact of values, languages, and nonverbal behavior on intercultural interaction. Prerequisites: sophomore standing. May be restricted to Communication majors only during early registration.

**COMMUN 3490. Mass Media Theory. 3 Credits.**

Survey of the theories of mass communication. Prerequisites: Communication [COMMUN] 2100 or senior status. May be restricted to Communication majors only during early registration.

**COMMUN 3525. Conflict and Communication. 3 Credits.**

Theory and analysis of communication in conflict situations across a variety of contexts. Prerequisite: sophomore standing required. May be restricted to Communication majors only during early registration.

**COMMUN 3561. Relational Communication. 3 Credits.**

Analysis of communication influences on relational identities and development. Prerequisite: sophomore standing and Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 3570. Performance of Literature. 3 Credits.**

(same as English [ENGLSH] 3570 and Theatre [THEATR] 3200). Analysis and oral interpretation of literary works. Graded on A/F basis only. Prerequisite: sophomore standing.

**COMMUN 3571. Group Decision Making Processes. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3521). Procedures and techniques for interpersonal communication and decision making in small groups. Prerequisite: sophomore standing. May be restricted to Communication majors only during early registration.

**COMMUN 3572. Argument and Advocacy. 3 Credits.**

Critical analysis and production of argument emphasizing evidence, reasoning, and refutation. Prerequisite: Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 3575. Business and Professional Communication. 3 Credits.**

Principles and practice of speech communication in business and professional settings. Emphasis on interviews, group conferences and personal presentations. Prerequisite: sophomore standing and Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 3580. Crisis Communication. 3 Credits.**

The theory and practice of corporate and political communication responses to crisis situations. Prerequisite: sophomore standing. May be restricted to Communication majors only during early registration.

**COMMUN 3636. Contemporary Issues in Mass Communication. 3 Credits.**

Introduction to current issues and trends and relationship among the new technologies, policies, and potential impact on society. Prerequisites: sophomore standing and Communication [COMMUN] 2100. May be restricted to Communication majors only during early registration.

**COMMUN 3701. Topics in Communication-General. 3 Credits.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Communication [COMMUN] 1200, 2100, departmental consent for repetition. May be restricted to Communication majors only during early registration.

**COMMUN 3703. Topics in Communication-Behavioral Sciences. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition. May be restricted to Communication majors only during early registration.

**COMMUN 3705. Topics in Communication-Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition. May be restricted to Communications majors only during early registration.

**COMMUN 4395. Professional Seminar in Television Production. 3 Credits.**

Application of principles to advanced television production, direction. Prerequisites: Communication [COMMUN] 3390 and instructor's consent. May be restricted to Communication majors only during early registration.

**COMMUN 4412. Gender, Language, and Communication. 3 Credits.** (same as Linguistics [LINGST] 4412 and Anthropology [ANTHRO] 4412). Relationship among gender, language, nonverbal communication, and culture. Prerequisite: junior standing or departmental consent. May be restricted to Communication majors only during early registration.

**COMMUN 4415. Language and Discourse. 3 Credits.** (same as Linguistics [LINGST] 4415). Analysis of the rules of social interaction and the functions of language in discourse. Prerequisites: junior standing and departmental consent. May be restricted to Communication majors only during early registration.

**COMMUN 4440. Ethical Issues in Communication. 3 Credits.** (same as Peace Studies [PEA\_ST] 4400). Exploration and analysis of ethical dimensions intrinsic to human communication. Prerequisite: junior standing or departmental consent. May be restricted to Communication majors only during early registration.

**COMMUN 4473. Political Communication. 3 Credits.** Study of role and impact of communication in political campaigns; historical and contemporary study of influence by communication; case studies and practicum. Prerequisite: junior standing or departmental consent. May be restricted to Communication majors only during early registration.

**COMMUN 4474. Theory and Research in Persuasion. 3 Credits.** Studies the persuasive process, attitude formation, modification. Prerequisites: junior standing and Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 4476. Organizational Communication. 3 Credits.** Theories of communication systems and processes in organizational structures; study of communication behavior in formal and informal organizational settings. Prerequisites: junior standing and Communication [COMMUN] 1200. May be restricted to Communication majors only during early registration.

**COMMUN 4481. Principles of Rhetoric. 3 Credits.** Development of rhetoric from time of Corax with emphasis on Aristotle; derivation, application of standards for judging effectiveness in communication. Prerequisites: Communication [COMMUN] 1200, junior standing and departmental consent. May be restricted to Communication majors only during early registration.

**COMMUN 4520. Family Communication. 3 Credits.** (same as Human Development and Family Studies [H\_D\_FS] 4680). Analysis of the functions and processes of communication within families. Prerequisite: junior standing or departmental consent. May be restricted to Communication majors only during early registration.

**COMMUN 4530. Health Communication. 3 Credits.** A general overview of the impact of communication on health, including doctor/patient communication and health campaigns. Graded on A-F basis only.

**COMMUN 4618. Television Program Analysis and Criticism. 3 Credits.** Development of critical viewing skills including analysis of program conventions, genres, and television aesthetics. Prerequisites: junior

standing. May be restricted to Communication Majors only during early registration.

**COMMUN 4628. Children, Adolescents and the Media. 3 Credits.** Focus on social scientific research concerning the mass media in the lives of children and adolescents. The course centers on media effects literature and controversies relevant to child and adolescent media users. Course involves readings, lectures, discussions of theories, concepts, methods, and finding. We will also consider social implication and personal choices in media use. Junior Standing Required. Graded on A-F basis only.

**COMMUN 4638. New Technologies and Communication. 3 Credits.** Explores the social implications of new technologies designed for communication. Assumes basic computer knowledge. Prerequisite: junior standing or instructor's consent. May be restricted to Communication Majors only during early registration.

**COMMUN 4701. Topics in Communication-General. 1-99 Credit.** Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition. May be restricted to Communication majors only during early registration.

**COMMUN 4703. Topics in Communication-Behavioral Science. 1-99 Credit.** Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition. May be restricted to Communication majors only during early registration.

**COMMUN 4705. Topics in Communication-Humanities. 1-99 Credit.** Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition. My be restricted to Communication majors only during early registration.

**COMMUN 4940. Internship. 1-99 Credit.** Directed professional experience within and outside the University in communication-related fields or organizations. Graded on S/U basis only. Prerequisites: Admission to department, junior standing, instructor's consent, 2.5 GPA.

**COMMUN 4960. Directed Reading. 1-99 Credit.** Independent reading, reports. Prerequisites: junior standing or instructor's consent.

**COMMUN 4974. Senior Project. 3 Credits.** Integration and adaptation of communication theories to an applied communication problem. Required for all majors. Prerequisite: admission to department, senior standing, and departmental consent.

**COMMUN 4975. Visual Literacy. 3 Credits.** Integration of theory and practice. The theoretical component of the class is grounded in the study of visual literacy and the practice component will focus on documentary filmmaking. Prerequisite: Communication [COMMUN] 3390, senior standing. May not be taken by graduate students. It is a capstone course for undergraduate students only. Prerequisite: Admission to the department.

**COMMUN 4996H. Honors in Communication. 1-2 Credit.** Special work for Honors candidates in communication. Consent of instructor required.

**COMMUN 4997. Honors in Communication. 2 Credits.** Special work for Honors candidates in communication.



**COMMUN 4997H. Honors in Communication. 1-2 Credit.**

Special work for Honors candidates in communication. Consent of Instructor Required.

**COMMUN 7412. Gender, Language, and Communication. 3 Credits.**

(same as Linguistics [LINGST] 7412 and Anthropology [ANTHRO] 7412). Relationship among gender, language, nonverbal communication, and culture. Prerequisite: graduate standing or departmental consent.

**COMMUN 7415. Language and Discourse. 3 Credits.**

(same as Linguistics [LINGST] 4415). Analysis of the rules of social interaction and the functions of language in discourse. Prerequisites: graduate standing and departmental consent.

**COMMUN 7440. Ethical Issues in Communication. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4440). Exploration and analysis of ethical dimensions intrinsic to human communication. Prerequisite: graduate standing or departmental consent.

**COMMUN 7473. Political Communication. 3 Credits.**

Study of role and impact of communication in political campaigns; historical and contemporary study of influence by communication; case studies and practicum. Prerequisite: graduate standing or departmental consent.

**COMMUN 7474. Theory and Research in Persuasion. 3 Credits.**

Studies the persuasive process, attitude formation, modification. Prerequisites: Communications [COMMUN] 3576 and departmental consent.

**COMMUN 7476. Organizational Communication. 3 Credits.**

Theories of communication systems and processes in organizational structures; study of communication behavior in formal and informal organizational settings. Prerequisites: Communications [COMMUN] 3571 or departmental consent. Graduate standing required.

**COMMUN 7481. Principles of Rhetoric. 3 Credits.**

Development of rhetoric from time of Corax with emphasis on Aristotle; derivation, application of standards for judging effectiveness in communication. Prerequisites: Communications [COMMUN] 1200, graduate standing and departmental consent.

**COMMUN 7520. Family Communication. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 4520). Analysis of the functions and processes of communication within families. Prerequisite: graduate standing or departmental consent.

**COMMUN 7618. Television Program Analysis and Criticism. 3 Credits.**

Development of critical viewing skills including analysis of program conventions, genres, and television aesthetics. Prerequisites: graduate standing and instructor's consent.

**COMMUN 7638. New Technologies and Communication. 3 Credits.**

Explores the social implications of new technologies designed for communication. Assumes basic computer knowledge. Prerequisite: graduate standing or instructor's consent.

**COMMUN 8001. Topics in Communication-General. 3 Credits.**

Study of selected topics in Communication. Topic and credit may vary semester to semester. Repeatable upon consent of department. Prerequisite: instructor's consent.

**COMMUN 8085. Problems. 1-99 Credit.**

Individual study not leading to thesis or dissertation. Prerequisite: instructor's consent.

**COMMUN 8090. Master's Thesis Research in Communication. 1-99 Credit.**

Research leading to thesis or dissertation. Prerequisite: instructor's consent. Graded on a S/U basis only.

**COMMUN 8110. Introduction to Graduate Study in Communication. 3 Credits.**

Orientation to the field. Introduction to research methods. Production of research proposal. Emphasizes scholarly style of writing.

**COMMUN 8120. Seminar in Quantitative Methods in Communication. 3 Credits.**

Quantitative methods of speech research.

**COMMUN 8130. Topics in Qualitative Research Methods. 3 Credits.**

Examination of assumptions and techniques of qualitative methods adopting an interpretive framework for analyzing communication phenomena. (May be Repeated) Graduate standing required.

**COMMUN 8140. Content Analysis. 3 Credits.**

Methods of Content Analysis; including consideration of reliability, validity Computer content analysis, codebooks.

**COMMUN 8150. Seminar in Television Criticism. 3 Credits.**

Examination and application of various critical methodologies to television texts.

**COMMUN 8160. Rhetorical Criticism. 3 Credits.**

Principles, practice criticism (description, analysis, evaluation) of rhetorical artifacts.

**COMMUN 8170. Seminar in Quantitative Methods in Communication II. 3 Credits.**

The focus of this course will be the study and practice of various multivariate statistical methods commonly used in communication research. Prerequisite: Communication [COMMUN] 8120. Instructor's consent required. Graded on A/F basis only. Graduate Standing Required.

**COMMUN 8310. Seminar in Interpersonal Communication. 3 Credits.**

Examines theory and research concerning face-to-face dyadic interactions. Emphasis on context of interpersonal communication events and processes of interactional management.

**COMMUN 8410. Seminar in Organizational Communication Theory. 3 Credits.**

Exploration of the theoretical foundations of interpersonal communication in the organization, groups and team development, leadership, organizational decision making, motivation and power, bureaucracy, new information technologies, organizational effectiveness and the change process.

**COMMUN 8420. Seminar in Small Group Communication. 3 Credits.**

Identifies and analyzes theories and variables which explain, predict, and/or influence small group communication.

**COMMUN 8510. Seminar in Mass Communication Theory. 3 Credits.**

This course will offer graduate students a broad overview of extant theories employed in the study of mass communication and mass media effects. The class will focus on theories of society, theories of media, and the relationships between mass communication and culture. It will also focus on theories of media structures, media organizations, media content, audiences, and media effects.

**COMMUN 8610. Survey of Political Communication. 3 Credits.**

Survey of theory and research on political communication; emphasis on messages and audience responses to messages.

**COMMUN 9050. Research. 1-9 Credit.**

Completes comprehensive exams and writes a literature review.

**COMMUN 9090. Doctoral Dissertation Research in Communication. 1-99 Credit.**

Research leading to thesis or dissertation. Prerequisite: instructor's consent. Graded on a S/U basis only.

**COMMUN 9170. Research Practicum. 3 Credits.**

Student conducts research under close supervision of faculty mentor. Goal: produce research report suitable for submission as convention paper, article, or book chapter. Consent of mentor required. Advanced graduate students. May be repeated once for credit.

**COMMUN 9280. Seminar in Communication Theory. 3 Credits.**

Examines the nature of theory, the assumptions underlying theoretical approaches to communication, and surveys themes in contemporary communication theories.

**COMMUN 9310. Seminar in Family Communication. 3 Credits.**

Examines research and theory of family communication; focus on family communication patterns and processes, emphasis on key conceptual, methodological and theoretical aspects of family communication scholarship and research on family forms, processes and outcomes. Graduate Standing Required. Graded on A-F basis only.

**COMMUN 9330. Topics in Interpersonal Communication. 3 Credits.**

The course will review theory and research on topics related to the study of communication and interpersonal relationships. Subjects will rotate and include areas such as relational conflict, gender communication, nonverbal communication, intercultural communication, or interpersonal violence and communication. Prerequisite: instructor's consent.

**COMMUN 9430. Topics in Organizational Communication. 3 Credits.**

Examination of theory and research in selected areas of organizational communication. Topics vary by semester. Topics may include socialization, power, gender, emotions, and others. May be repeated. Prerequisite: graduate standing.

**COMMUN 9520. Seminar in Mass Media Effects. 3 Credits.**

Explores current research in the processes and effects of mass communication. Readings pertain to the current social and psychological effects of media on viewers.

**COMMUN 9530. Topics in Mass Communication. 3 Credits.**

Examination of theory and research in selected areas of media communication. Topics vary by semester. May be repeated. Prerequisite: Graduate Standing.

**COMMUN 9620. Political Campaign Debates. 3 Credits.**

Theory and research on political campaign debates applied to analyses of candidate debates. Focus on primary and general presidential debates.

**COMMUN 9630. Political Advertising. 3 Credits.**

Theory and research on political advertising applied to analyses of candidate advertisements. Focus on primary and general presidential television spots and web pages.

**COMMUN 9720. Seminar in Theories of Rhetoric and Criticism. 1-6 Credit.**

Directed research on selected topics in rhetorical theory and criticism. Prerequisite: instructor's consent.

## Communication Science And Disorders (C\_S\_D)

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**C\_S\_D 1000. Introduction to Communication Science and Disorders. 1 Credit.**

Nature of communication and its development; types of speech, language and hearing disorders; professional preparation, settings, and work of speech-language pathologists and audiologists. Course graded on S/U basis only.

**C\_S\_D 1050. Signed English. 3 Credits.**

Introduction to the English-based sign system, Signed English, a system that has been developed to bridge the gap between English and American Sign Language. Restricted to Communication, Science and Disorder majors only during Early Registration. Graded on A-F basis only.

**C\_S\_D 1060. Human Language. 3 Credits.**

(same as Anthropology [ANTHRO] 1060, Linguistics [LINGST] 1060 and English [ENGLSH] 1060). General introduction to various aspects of linguistic study. Elementary analysis of language data with some attention to application of linguistic study to other disciplines.

**C\_S\_D 1100. American Sign Language I. 5 Credits.**

Introduction to American Sign Language (ASL). Development of basic expressive and receptive skills in ASL, the manual alphabet, numbers, and signed vocabulary. Includes an overview of ASL syntax and grammar. Course graded on A/F basis only.

**C\_S\_D 1200. American Sign Language II. 5 Credits.**

This course is designed to increase students' understanding of American Sign Language. Students will increase their sign vocabulary, expressive and receptive skills, an understanding of ASL syntax and grammar. Prerequisite: Communication, Science and Disorder [C\_S\_D] 1100 or equivalent. Graded on A-F basis only.

**C\_S\_D 2120. Survey of Communication Disorders. 3 Credits.**

Systematic survey of the disorders of speech, language and hearing.

**C\_S\_D 2150. American Sign Language III. 3 Credits.**

This course expands on vocabulary and signing skills developed in ASL II. Includes review of ASL grammar and extensive discussions of ASL linguistic structure and Deaf culture. Class is conducted entirely in ASL. Prerequisite: Communication Science and Disorders [C\_S\_D] 1200 with minimum grade of C or instructor's consent. Course graded on A/F basis only.

**C\_S\_D 3010. American Phonetics. 3 Credits.**

(Same as Linguistics [LINGST] 3010). Analysis of production and acoustics of the sounds of speech with an emphasis on American English; practice in broad and narrow transcription using the International Phonetic Alphabet.

**C\_S\_D 3020. Normal Language Development. 3 Credits.**

(same as Psychology [PSYCH] 3810). Language development in children and changes in language processing during normal aging. Cognition and language; language learning processes; language sample analysis; relationship between spoken and written language. Prerequisites: Psychology [PSYCH] 2410 or 3140, or Linguistics [LINGST] 4600.

**C\_S\_D 3210. Anatomy and Physiology of the Speech Mechanism. 2 Credits.**

(same as Linguistics [LINGST] 3210). Introduction to anatomical and functional aspects of the speech mechanism. Prerequisite: must be taken

concurrently with Communication Science and Disorders [C\_S\_D] 3220; CSD majors only or instructor's consent.

**C\_S\_D 3220. Speech Acoustics. 2 Credits.**

(same as Linguistics [LINGST] 3220). An introduction to the acoustic aspects of speech as they relate to the respiratory, phonatory, resonatory, and articulatory systems. Prerequisites: Must be taken concurrently with Communication Science and Disorders [C\_S\_D] 3210; CSD majors only or instructor's consent.

**C\_S\_D 3230. Hearing Science. 3 Credits.**

Introduction to the nature of sound and its measurement; anatomy and physiology of the auditory and vestibular systems; psychoacoustic methods and phenomena.

**C\_S\_D 4001. Topics in Communication Science and Disorders. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated with program consent. Prerequisites: junior standing and instructor's consent.

**C\_S\_D 4020. Language Disorders in Children. 3 Credits.**

Overview of language disorders from early childhood through adolescence. Includes language disorders as primary disability and as secondary to other disabilities. Introduction to assessment and intervention. Prerequisites: Communication Science and Disorders [C\_S\_D] 2120, 3020, Linguistics [LINGST] 4600. Communication Science and Disorder majors only.

**C\_S\_D 4030. Language Disorders of Adults. 2 Credits.**

Introduction to acquired adult language disorders. Review of neuroanatomy/physiology, etiology and symptomatology, with introduction to assessment and treatment procedures. Prerequisites: Communication Science and Disorders [C\_S\_D] 2120, 3020, 4430, and Linguistics [LINGST] 4600 or instructor's consent.

**C\_S\_D 4050. Clinical Applications of Sign Language. 3 Credits.**

This course covers research, theory, and methods of using sign language to assist the communication of the Deaf, individuals with disabilities, and hearing learners. Use of sign language to improve literacy and classroom management will also be targeted. Prerequisites: Communication Science and Disorders [C\_S\_D] 1050 and 1100 or equivalent. Instructor's consent required. Course graded on A/F basis only.

**C\_S\_D 4200. Professional Voice. 2 Credits.**

Voice production, common voice problems and their causes; healthy vocal habits and techniques to achieve optimal voice. Communication Science and Disorders students may not take for graduate credit.

**C\_S\_D 4210. Fluency Disorders. 2 Credits.**

Introduction to the nature, assessment, and treatment of fluency disorders. Emphasis on developmental stuttering. Prerequisite: Communication Science and Disorders [C\_S\_D] 2120, 3210.

**C\_S\_D 4220. Voice Disorders. 1 Credit.**

Introduction to voice disorders in children and adults. Includes overview of perceptual and instrumental assessment procedures and selected treatment approaches. Prerequisites: Communication Science and Disorders [C\_S\_D] 2120, 3010, 3210, 4430.

**C\_S\_D 4320. Disorders of Phonology and Articulation. 3 Credits.**

Overview of disorders of use and production of speech sounds with an emphasis on developmental disorders. Introduction to assessment and treatment. Prerequisites: Communication Science and Disorders [C\_S\_D] 2120, 3010, 3020, 3210. Communication Science and Disorders majors only.

**C\_S\_D 4330. Introduction to Audiology. 3 Credits.**

Principles and techniques of audiological testing; etiologies of hearing impairment; current technologies in rehabilitation. Prerequisites: Communication Science and Disorders [C\_S\_D] 3230; CSD majors only or instructor's consent.

**C\_S\_D 4340. Aural Rehabilitation. 3 Credits.**

Identification, evaluation, and management of problems associated with hearing impairment in both children and adults. Includes issues related to speech/language development, communication, education, and social factors. Prerequisites: Communication Science and Disorders [C\_S\_D] 3230 and 4330.

**C\_S\_D 4430. Neurophysiology for Speech, Language, and Hearing. 3 Credits.**

Principles of basic neurophysiology, emphasizing correlation of structure and function of the nervous system. Prerequisites: CSD majors only or instructor's consent.

**C\_S\_D 4810. Psycholinguistics. 3 Credits.**

(same as Linguistics [LINGST] 4810). Examination of the knowledge and processes that underlie the human ability to produce and understand language. Prerequisite: instructor's consent.

**C\_S\_D 4820. Speech Perception. 3 Credits.**

(same as Linguistics [LINGST] 4820). Selected topics in the perceptual processing of speech sounds and spoken language. Prerequisite: instructor's consent.

**C\_S\_D 4830. Individual Differences in Language Processing. 2 Credits.**

Examination of the normal variations exhibited across individuals in the acquisition, use, and representation of language. Also considered are individual differences seen in second language learning, the aging process, and language disorders. Prerequisite: instructor's consent.

**C\_S\_D 4840. Language and Development in Infancy. 3 Credits.**

Overview of theory and research on the foundations and development of language in infancy (0 to 2 years), with an emphasis on relevant, interrelated areas of development, individual differences, early recognition of delay, and assessment. Senior Standing Required. Instructor's consent required.

**C\_S\_D 4900. Clinical Observation in Communication Disorders. 2 Credits.**

Directed clinical observations designed to prepare the student for clinical practicum. Required for professional certification. Graded on a S/U basis only. Prerequisite: senior standing and departmental consent. Communication Science and Disorders [C\_S\_D] majors only.

**C\_S\_D 4945. Clinical Apprenticeship in Communication Disorders. 1-3 Credit.**

Supervised observation and clinical experience in speech-language pathology for undergraduates. Communication Science and Disorders majors only. Prerequisite: senior standing and departmental consent.

**C\_S\_D 4950. Research Apprenticeship. 1-99 Credit.**

Research apprenticeship with a faculty member, assisting in the development and execution of research in communication processes and disorders. May be repeated to 6 hrs. maximum. Prerequisite: instructor's consent.

**C\_S\_D 4960. Directed Reading in Communication Science and Disorders. 1-3 Credit.**

Independent reading; reports. Prerequisite: instructor's consent.

**C\_S\_D 4990. Honors Thesis. 3 Credits.**

Individual honors thesis on a topic selected with a faculty advisor. Requires planning, conducting, and writing up a research project under the guidance of a faculty member. Successful completion of thesis and maintenance of 3.3 GPA, leads to degree with departmental honors. Prerequisites: Senior standing; 3.3 GPA; 3.5 GPA in CSD [Communication Science and Disorders] courses; instructor's consent. Restricted to CSD students only. Graded on A/F basis only.

**C\_S\_D 7001. Topics in Communication Science and Disorders. 1-99 Credit.**

Study of selected topics in speech pathology/audiology. Topic and credit may vary from semester to semester. Prerequisites: instructor's consent, instructor's and departmental consent for repetition.

**C\_S\_D 7050. Clinical Applications of Sign Language. 3 Credits.**

This course covers research, theory, and methods of using sign language to assist the communication of the Deaf, individuals with disabilities, and hearing learners. Use of sign language to improve literacy and classroom management will also be targeted. Graded on A-F basis only. Prerequisites: C\_S\_D 1050 and C\_S\_D 1100 or equivalent. Instructor's consent required.

**C\_S\_D 7085. Problems in Communication Science and Disorders. 1-99 Credit.**

Individual study not leading to thesis or dissertation. Prerequisite: instructor's consent.

**C\_S\_D 7200. Professional Voice. 2 Credits.**

Voice production, common voice problems and their causes; healthy vocal habits and techniques to achieve optimal voice. Communication Science Disorder [C\_S\_D] students may not take for graduate credit. Graduate Standing Required.

**C\_S\_D 7340. Aural Rehabilitation. 3 Credits.**

Identification, evaluation, and management of problems associated with hearing impairment in both children and adults. Includes issues related to speech/language development, communication, education, and social factors. Prerequisites: graduate standing and Communication, Science Disorders [C\_S\_D] 3230 and 4330.

**C\_S\_D 7430. Neurophysiology for Speech, Language, and Hearing. 3 Credits.**

Principles of basic neurophysiology, emphasizing correlation of structure and function of the nervous system. Prerequisite: CSD majors or instructor's consent.

**C\_S\_D 7810. Psycholinguistics. 3 Credits.**

(same as Linguistics [LINGST] 7810). Examination of the knowledge and processes that underlie the human ability to produce and understand language. Prerequisite: graduate standing and instructor's consent.

**C\_S\_D 7820. Speech Perception. 3 Credits.**

(same as Linguistics [LINGST] 7820). Selected topics in the perceptual processing of speech sounds and spoken language. Prerequisite: consent of instructor.

**C\_S\_D 7830. Individual Differences in Language Processing. 2 Credits.**

Examination of the normal variations exhibited across individuals in the acquisition, use, and representation of language. Also considered are individual differences seen in second language learning, the aging process, and language disorders. Prerequisite: instructor's consent.

**C\_S\_D 7840. Language and Development in Infancy. 3 Credits.**

Overview of theory and research on the foundations and development of language in infancy (0 to 2 years), with an emphasis on relevant, interrelated areas of development, individual differences, early recognition of delay, and assessment. Graduate Standing Required.

**C\_S\_D 8001. Topics in Communication Science and Disorders. 1-99 Credit.**

Study of selected topics in speech pathology/audiology. Topic and credit may vary from semester to semester. Prerequisites: graduate standing and instructor's consent, instructor's and departmental consent for repetition.

**C\_S\_D 8020. Developmental Language Disorders. 3 Credits.**

Nature, etiology, assessment and management of childhood language disorders. Prerequisites: Communication, Science and Disorders [C\_S\_D] 3020, 4020 and Linguistics [LINGST] 7600 or equivalent, or instructor's consent.

**C\_S\_D 8030. Acquired Language Disorders. 3 Credits.**

Etiology, symptomatology, assessment and rehabilitation of acquired neurogenic communication disorders in aphasia, traumatic brain injury, dementia, and right-hemisphere syndrome. Prerequisite: Communication Science and Disorders [C\_S\_D] 4030 and 4430, or instructor's consent.

**C\_S\_D 8050. Research in Communication Science and Disorders. 1-99 Credit.**

Independent research leading to a report but not to a thesis or dissertation. Prerequisite: instructor's consent.

**C\_S\_D 8085. Problems in Communication Science and Disorders. 1-99 Credit.**

Individual study not leading to thesis or dissertation. Prerequisite: graduate standing and instructor's consent.

**C\_S\_D 8087. Seminar: Contemporary Topics in Speech-Language Pathology. 1-3 Credit.**

Advanced study involving critical literature review and research on selected topics in speech and language. May be repeated for up to 6 credits. Prerequisite: instructor's consent.

**C\_S\_D 8090. Research in Communication Science and Disorders. 1-99 Credit.**

Research leading to thesis or dissertation. Prerequisite: instructor's consent. Graded on a S/U basis only.

**C\_S\_D 8150. Advanced Speech Science. 2 Credits.**

Advanced exploration of the physiology of speech production and the corresponding acoustic characteristics of speech. Includes experience with pertinent laboratory instrumentation. Prerequisite: Communication Science and Disorders [C\_S\_D] 3210 and 3220.

**C\_S\_D 8200. Motor Speech Disorders. 3 Credits.**

Review of neuroanatomic mechanisms underlying speech production; etiology, symptomatology, epidemiology, and prognosis of motor speech disorders resulting from acquired neurological damage. Emphasis on clinical assessment and rehabilitation procedures. Prerequisite: instructor's consent.

**C\_S\_D 8210. Disorders of Fluency. 3 Credits.**

Identification and remediation of fluency disorders in children and adults. Prerequisites: Communication, Science and Disorders [C\_S\_D] 3210, 4210, 4430, or equivalent or instructor's consent.

**C\_S\_D 8220. Disorders of Voice. 2 Credits.**

Diagnosis and management of communicative disorders resulting from pathologies or abnormalities of the craniofacial structures and from pathologies or misuse of the phonatory systems. Prerequisites: Communication, Science and Disorders [C\_S\_D] 3210, 4320 and 4210 or instructor's consent.

**C\_S\_D 8230. Dysphagia. 3 Credits.**

Etiology, symptomatology, and epidemiology of acquired and developmental swallowing disorders (dysphagia). Emphasis on instrumental and non-instrumental methods for assessing and treating dysphagia. Prerequisites: Communication Science and Disorders [C\_S\_D] 3210, 4220, 8200; or instructor's consent.

**C\_S\_D 8240. Orofacial Anomalies. 1 Credit.**

Nature, causes, diagnosis, and treatment of disorders of communication associated with congenital orofacial anomalies. Emphasis on cleft palate. Prerequisites: Communication, Science and Disorders [C\_S\_D] 3210, 4320.

**C\_S\_D 8250. Clinical Methods in Speech-Language Pathology. 3 Credits.**

An introduction to clinical procedures and evidence-based intervention methods relating to speech and language disorders. Topics include session design, data collection, measurement of progress, reporting of clinical results, and various treatment options. Graded on A-F basis only. Prerequisite: departmental consent.

**C\_S\_D 8260. Diagnosis in Speech-Language Pathology. 3 Credits.**

General principles of diagnosis; specific diagnostic tools and procedures for various speech and language disorders. Prerequisite: departmental consent.

**C\_S\_D 8320. Speech Sound Disorders. 3 Credits.**

Principles of clinical assessment and treatment for speech sound disorders in children. Includes foundations in research on early speech sound acquisition, organic and developmental disorders, and treatment efficacy. Graded on A-F basis only. Prerequisite: C\_S\_D 3010 or equivalent or permission of instructor; departmental consent.

**C\_S\_D 8420. Reading and Language Disabilities in School-Age Children. 2 Credits.**

Theories, research, and practice in reading development and disorders. Assessment and remediation of reading disabilities related to language disorders of various etiologies including developmental language disorders and head injury. Prerequisite: Communication, Science and Disorders [C\_S\_D] 4020 or 8020.

**C\_S\_D 8430. Introduction to Augmentative and Alternative Communication. 2 Credits.**

Students will learn the principles of AAC assessment, methods of intervention, and types of technology available for individuals unable to communicate fully through speech. Prerequisites: Motor Speech Disorders; Language Disorders in Children; Acquired Language Disorders. Graded on A/F basis only. Prerequisite: Communication Science and Disorders [C\_S\_D] 8020 and 8030.

**C\_S\_D 8500. Issues in Professional Practice. 2 Credits.**

Organizational, interprofessional, economic, legal, and ethical aspects of delivering speech, language, and hearing services. Graduate standing required; departmental consent. Graded on A/F basis only.

**C\_S\_D 8600. Clinical Language Analysis. 3 Credits.**

This course provides a theoretical framework for understanding the morphology, semantics, syntax, and pragmatics of English as well

as practice in the analysis of typical and atypical language samples. Graduate standing and departmental consent required. Graded on A/F basis only.

**C\_S\_D 8935. Clinical Practice in Audiology. 1 Credit.**

Supervised practice in hearing screening, hearing conservation, and aural re/habilitation. May be repeated for credit. Graded S/U only.

**C\_S\_D 8945. Clinical Practice in Speech-Language Pathology. 1-10 Credit.**

Supervised clinical practice in speech pathology for graduate students. May be repeated for credit. Prerequisite: Communication [C\_S\_D] 4945 or equivalent.

**C\_S\_D 8960. Directed Reading in Communication Science and Disorders. 1-3 Credit.**

Independent reading; reports. Prerequisite: graduate standing and instructor's consent.

**C\_S\_D 9050. Research in Communication Science and Disorders. 1-99 Credit.**

Independent research leading to a report but not to a thesis or dissertation. Prerequisite: graduate standing and instructor's consent.

**C\_S\_D 9087. Seminar: Contemporary Topics in Speech-Language Pathology. 1-3 Credit.**

Advanced study involving critical literature review and research on selected topics in speech and language. May be repeated for up to 6 credits. Prerequisite: instructor's consent.

**C\_S\_D 9090. Research in Communication Science and Disorders. 1-99 Credit.**

Research leading to thesis or dissertation. Prerequisite: instructor's consent. Graded on a S/U basis only.

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## Computer Science (CMP\_SC)

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**CMP\_SC 1000. Introduction to Computer Science. 1 Credit.**

This course introduces the Computer Science field, including the history of computers, career opportunities, and ethical/social issues. There will be lectures given by MU Computer Science faculty to discuss exciting fields as well as career advisement given by Computer Science industry representatives. Restricted to freshman/sophomore Computer Science [CMP\_SC]/ Information Technology [INFOTC] majors.

**CMP\_SC 1001. Topics in Computer Science. 1-99 Credit.**

Topic and credit may vary from semester to semester. May be repeated upon consent of department.

**CMP\_SC 1040. Introduction to Problem Solving and Programming. 3 Credits.**

An introduction to problem solving methods and programming concepts, providing experience in designing, developing, implementing, and testing programs. Cannot be taken for credit after Computer Science [CMP\_SC] 1050.

**CMP\_SC 1050. Algorithm Design and Programming I. 3 Credits.**

This course provides experience in developing algorithms, designing, implementing programs. Topics include syntax/semantics, flow control, loops, recursion, I/O, arrays, strings and pointers. Prerequisites: Mathematics [MATH] 1100 or 1160 or 1500 (C- or better). Math Reasoning Proficiency Course.

**CMP\_SC 2001. Topics in Computer Science. 1-99 Credit.**

Topic and credit may vary from semester to semester. May be repeated upon consent of department. Prerequisite: departmental consent.

**CMP\_SC 2050. Algorithm Design and Programming II. 3 Credits.**

A study of fundamental techniques and algorithms for representing and manipulating data structures. Topics include data abstraction, recursion, stacks, queues, linked lists, trees, efficient methods of sorting and searching, and Big-O analysis. Prerequisite: Computer Science [CMP\_SC] 1050.

**CMP\_SC 2111. Production Languages. 1-3 Credit.**

The study of the syntax, semantics, and applications of one programming language suitable for large scale scientific or commercial projects, such as FORTRAN, COBOL, PL/1, C, or ADA. May be taken more than once for credit. Prerequisite: Computer Science [CMP\_SC] 2050.

**CMP\_SC 2830. Introduction to the Internet, WWW and Multimedia Systems. 3 Credits.**

This course will attempt to provide a comprehensive understanding of the evolution, the technologies, and the tools of the Internet. In particular, issues pertaining to the World Wide Web and Multimedia (HTML, CGI, Web based applications) will be discussed in detail. Prerequisites: Computer Science [CMP\_SC] 2050.

**CMP\_SC 3001. Topics in Computer Science. 1-99 Credit.**

Current and new technical developments in computer science. For juniors and seniors. Prerequisite: departmental consent. May be repeated for 6 hours credit.

**CMP\_SC 3050. Advanced Algorithm Design. 3 Credits.**

This class surveys fundamental algorithms and data structures that have wide practical applicability, including search trees and graph algorithms. Emphasis is placed on techniques for efficient implementation and good software development methodologies. Prerequisites: Computer Science [CMP\_SC] 2050.

**CMP\_SC 3270. Introduction to Digital Logic. 3 Credits.**

Basic tools, methods and procedures to design combinational and sequential digital circuits and systems, including number systems, boolean algebra, logic minimization, adder design, memory elements, and finite state machine design. Prerequisites: Computer Science [CMP\_SC] 2050.

**CMP\_SC 3280. Computer Organization and Assembly Language. 3 Credits.**

Introduces computer architectures, programming concepts including parameter passing, I/O, interrupt handling, DMA, memory systems, cache, and virtual memory. Prerequisite: Computer Science [CMP\_SC] 3270. Graded on A-F basis only.

**CMP\_SC 3330. Object Oriented Programming. 3 Credits.**

This course focuses on object-oriented programming concepts: abstraction, polymorphism, encapsulation, inheritance, interfaces, abstract classes, files, streams, and object serialization. Topics such as GUI and event-driven programming are also tackled. Prerequisite: Computer Science [CMP\_SC] 2050.

**CMP\_SC 3380. Database Applications and Information Systems. 3 Credits.**

Covers fundamental topics of database management systems (DBMS) and database-enabled applications. Topics include a brief history of secondary storage and databases, data modeling, introductory SQL, an overview of current database trends, and current popular database

systems. Prerequisite: Computer Science [CMP\_SC] 2050. Graded on A/F basis only.

**CMP\_SC 3530. UNIX Operating System. 3 Credits.**

Introduction to the UNIX operating system and its interfaces including the file system, shell, editors, pipes and filters, input/output system, shell programming, program development including C, and document preparation. Prerequisite: Advanced C programming experience.

**CMP\_SC 3940. Internship in Computer Science. 1-3 Credit.**

Computer-related experience in business or industry jointly supervised by faculty and computer professionals. Students should apply one semester in advance for consent of the supervising professor. Prerequisite: Computer Science [CMP\_SC] 2050. Graded on a S/U basis only.

**CMP\_SC 4001. Topics in Computer Science. 1-99 Credit.**

Topic and credit may vary from semester to semester. May be repeated upon consent of department.

**CMP\_SC 4050. Design and Analysis of Algorithms I. 3 Credits.**

This course reviews and extends earlier work with linked structures, sorting and searching algorithms, and recursion. Graph algorithms, string matching, combinatorial search, geometrical algorithms and related topics are also studied. Prerequisite: Computer Science [CMP\_SC] 3050 and Mathematics [MATH] 2320.

**CMP\_SC 4060. String Algorithms. 3 Credits.**

This course provides an introduction to algorithms that efficiently compute patterns in strings. Topics covered include basic properties of strings, data structures for processing strings, string decomposition, exact and approximate string matching algorithms. Prerequisite: Computer Science [CMP\_SC] 4050. Graded on A/F basis only.

**CMP\_SC 4070. Numerical Methods for Science and Engineering. 3 Credits.**

Introduces basic numerical methods widely used by computer scientists/engineers. Students will use the MATLAB platform to computationally solve problems, such as finding roots of nonlinear equations, solving systems of equations, fitting curves, solving ODEs, finding eigenvalues, etc. Prerequisites: Computer Science [CMP\_SC] 2050, junior standing or instructor's consent. Graded on A/F basis only.

**CMP\_SC 4085. Problems in Computer Science. 1-6 Credit.**

Independent investigation or project in Computer Science. Prerequisite: senior standing in Computer Science. May be repeated to up 6 hours.

**CMP\_SC 4270. Computer Architecture I. 3 Credits.**

Architectural features of high-performance computer systems including hierarchical and virtual memory, pipelining, vector processing and an introduction to multiple-processor systems. Prerequisites: Computer Science [CMP\_SC] 3270.

**CMP\_SC 4320. Software Engineering I. 3 Credits.**

Overview of software life cycle, including topics in systems analysis and requirements specification, design, implementation testing and maintenance. Uses modeling techniques, project management, peer review, quality assurance, and system acquisition. Prerequisite: Computer Science [CMP\_SC] 2050. Co-requisite: Computer Science [CMP\_SC] 3380.

**CMP\_SC 4330. Object Oriented Design I. 3 Credits.**

Building on a prior knowledge of program design and data structures, this course covers object-oriented design, including classes, objects, inheritance, polymorphism, and information hiding. Students will apply techniques using a modern object-oriented implementation language.

Enrollment limited to undergraduate students only. Prerequisite: Computer Science [CMP\_SC] 2050.

**CMP\_SC 4380. Database Management Systems I. 3 Credits.**

Fundamental concepts of current database systems with emphasis on the relational model. Topics include entity-relationship model, relational algebra, query by example, indexing, query optimization, normal forms, crash recovery, web-based database access, and case studies. Project work involves a modern DBMS, such as Oracle, using SQL. Prerequisite: Computer Science [CMP\_SC] 3380.

**CMP\_SC 4410. Theory of Computation I. 3 Credits.**

An introductory study of computation and formal languages by means of automata and related grammars. The theory and applications of finite automata, regular expressions, context free grammars, pushdown automata and Turing machines are examined. May not be counted toward Computer Science MS/PHD. Prerequisite: Mathematics [MATH] 2320.

**CMP\_SC 4430. Compilers I. 3 Credits.**

Introduction to the translation of programming languages by means of interpreters and compilers. Lexical analysis, syntax specification, parsing, error-recovery, syntax-directed translation, semantic analysis, symbol tables for block structured languages, and run-time storage organization. May not be counted toward Computer Science MS/PHD. Prerequisite: Mathematics [MATH] 2320.

**CMP\_SC 4450. Principles of Programming Languages. 3 Credits.**

An introduction to the structure, design and implementation of programming languages. Topics include syntax, semantics, data types, control structures, parameter passing, run-time structures, and functional and logic programming. May not be counted toward Computer Science MS/PHD. Prerequisite: Computer Science [CMP\_SC] 2050.

**CMP\_SC 4520. Operating Systems I. 3 Credits.**

Basic concepts, theories and implementation of modern operating systems including process and memory management, synchronization, CPU and disk scheduling, file systems, I/O systems, security and protection, and distributed operating systems. Prerequisites: Computer Science [CMP\_SC] 3050 and Mathematics [MATH] 1700.

**CMP\_SC 4610. Computer Graphics I. 3 Credits.**

Basic concepts and techniques of interactive computer graphics including hardware, software, data structures, mathematical manipulation of graphical objects, the user interface, and fundamental implementation algorithms. Prerequisites: Computer Science [CMP\_SC] 3050 and Mathematics [MATH] 1500 or 1300 and 1400.

**CMP\_SC 4620. Physically Based Modeling and Animation. 3 Credits.**

This course introduces students to physically based modeling and animation methodology for computer graphics and related fields such as computer vision, visualization, biomedical imaging and virtual reality. We will explore current research issues and will cover associated computational methods for simulating various visually interesting physical phenomena. This course should be appropriate for graduate students in all areas as well as advanced undergraduate students. Graded on A/F basis only. Prerequisites: Computer Science [CMP\_SC] 4610, good knowledge of C or C++ programming, no physics background necessary.

**CMP\_SC 4650. Digital Image Processing. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4850). Fundamentals of digital image processing hardware and software including digital image acquisition, image display, image enhancement,

image transforms and segmentation. Prerequisites: Computer Science [CMP\_SC] 2050, Statistics [STAT] 4710 or instructor's consent.

**CMP\_SC 4670. Digital Image Compression. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4675) Covers digital image formation, information theory concepts, and fundamental lossless and lossy image compression techniques including bit plane encoding, predictive coding, transform coding, block truncation coding, vector quantization, subband coding and hierarchical coding. Prerequisite: Computer Science [CMP\_SC] 2050.

**CMP\_SC 4720. Introduction to Machine Learning and Pattern Recognition. 3 Credits.**

(Same as Electrical Engineering [ECE] 4720) This course provides foundations and methods in machine learning and pattern recognition that address the problem of programming computers to optimize performance by learning from example data or expert knowledge. Prerequisite: Computer Science [CMP\_SC] 2050 and Statistics [STAT] 4710 or instructor consent. Graded on A/F basis only.

**CMP\_SC 4730. Building Intelligent Robots. 4 Credits.**

(same as Electrical and Computer Engineering [ECE] 4340). Covers the design and development of intelligent machines, emphasizing topics related to sensor-based control of mobile robots. Includes mechanics and motor control, sensor characterization, reactive behaviors and control architectures. Prerequisites: junior standing and programming experience in one of the following programming languages: Basic, C, C++, or Java.

**CMP\_SC 4750. Artificial Intelligence I. 3 Credits.**

Introduction to the concepts and theories of intelligent systems. Various approaches to creating intelligent systems, including symbolic and computational approaches, insight into the philosophical debates important to understanding AI. Prerequisite: Computer Science [CMP\_SC] 3050 and junior standing.

**CMP\_SC 4770. Introduction to Computational Intelligence. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4870). Introduction to the concepts, models and algorithms for the development of intelligent systems from the standpoint of the computational paradigms of neural networks, fuzzy set theory and fuzzy logic, evolutionary computation and swarm optimization.

**CMP\_SC 4830. Science and Engineering of the World Wide Web. 3 Credits.**

This course will study the science and engineering of the World Wide Web. We will study the languages, protocols, services and tools that enable the web. Emphasis will be placed on basics and technologies. Prerequisites: Computer Science [CMP\_SC] 2830.

**CMP\_SC 4850. Computer Networks I. 3 Credits.**

Introduction to concepts and terminology of data communications and computer networking. Basic protocols and standards, applications of networking, routing algorithms, congestion avoidance, long-haul and local networks. Prerequisite: Computer Science [CMP\_SC] 3270 and Mathematics [MATH] 2320.

**CMP\_SC 4860. Network Security. 3 Credits.**

Principles and practice of cryptography, network security, and computer system security. It includes symmetric and asymmetric cryptography, authentication, security applications such as secure email, IP security, Web security, and system security issues such as intruders, viruses, worms, Trojan horses, and firewalls. Graded on A/F basis only. Prerequisite: Computer Science [CMP\_SC] 4850.

**CMP\_SC 4870. Wireless and Mobile Networks. 3 Credits.**

Concepts and techniques in wireless and mobile networks: cellular concepts, wireless physical layer, wireless MAC protocol, mobility management, power management, wireless network security, wireless telecommunication system, wireless LAN, wireless ad hoc networking, wireless personal area network. Prerequisite: Computer Science [CMP\_SC] 4850. Graded on A/F basis only.

**CMP\_SC 4970. Senior Capstone Design I. 3 Credits.**

Design projects emphasizing team work, communication skills, and prototyping. Covers professional ethics, intellectual property/patenting, knowledge of engineering literature, safety, economic and environmental impact of technology. Essays, oral and written reports. Prerequisites: Computer Science [CMP\_SC] 4320 and senior standing.

**CMP\_SC 4980. Senior Capstone Design II. 2 Credits.**

Course entails completion of Computer Science [CMP\_SC] 4970 design project. Design prototyping, testing, evaluation, presentation, and preparation of documentation. Prerequisite: Computer Science [CMP\_SC] 4970.

**CMP\_SC 4990. Undergraduate Research in Computer Science. 0-6 Credit.**

Independent investigation or project in Computer Science. Prerequisite: senior standing in Computer Science. May be repeated to 6 hours.

**CMP\_SC 4995. Undergraduate Research in Computer Science - Honors. 1-6 Credit.**

Independent investigation to be presented as an undergraduate honors thesis. Prerequisite: honors student in Computer Science.

**CMP\_SC 7001. Topics in Computer Science. 1-99 Credit.**

Topic and credit may vary from semester to semester. May be repeated upon consent of department. Prerequisite: graduate standing.

**CMP\_SC 7010. Computational Methods in Bioinformatics. 3 Credits.**

(Same as Informatics Institute [INFOINST] 7010) Introduces the fundamental concepts and basic computational techniques for mainstream bioinformatics problems. Emphasis will be placed on the computational aspect of bioinformatics, including formulation of a biological problem in a computable problem, design of scoring functions and algorithms, confidence assessment of prediction results and software development. Prerequisite: Computer Science [CMP\_SC] 4050 and Statistics [STAT] 4710.

**CMP\_SC 7050. Design and Analysis of Algorithms I. 3 Credits.**

This course reviews and extends earlier work with linked structures, sorting and searching algorithms, and recursion. Graph algorithms, string matching, combinatorial search, geometrical algorithms and related topics are also studied. Cannot be counted toward CS MS/PHD. Prerequisites: Computer Science [CMP\_SC] 3050 and Mathematics [MATH] 2320.

**CMP\_SC 7060. String Algorithms. 3 Credits.**

This course provides an introduction to algorithms that efficiently compute patterns in strings. Topics covered include basic properties of strings, data structures for processing strings, string decomposition, exact and approximate string matching algorithms. Prerequisite: Computer Science [CMP\_SC] 4050. Graded on A/F basis only.

**CMP\_SC 7070. Numerical Methods for Science and Engineering. 3 Credits.**

Introduces basic numerical methods widely used by computer scientists/engineers. Students will use the MATLAB platform to computationally solve problems, such as finding roots of nonlinear equations, solving systems of equations, fitting curves, solving ODEs, finding eigenvalues,

etc. Prerequisites: Computer Science [CMP\_SC] 2050 or instructor's consent. Graded on A/F basis only. Graduate Standing Required.

**CMP\_SC 7087. Seminar in Computer Science. 1 Credit.**

Reviews of recent investigations, projects of major importance.

**CMP\_SC 7270. Computer Architecture I. 3 Credits.**

Architectural features of high-performance computer systems including hierarchical and virtual memory, pipelining, vector processing and an introduction to multiple-processor systems. Prerequisites: graduate standing and Computer Science [CMP\_SC] 3210 or 3270.

**CMP\_SC 7320. Software Engineering I. 3 Credits.**

Overview of software life cycle, including topics in systems analysis and requirements specification, design, implementation testing and maintenance. Uses modeling techniques, project management, peer review, quality assurance, and system acquisition. May not be counted toward CS MS/PHD. Prerequisite: Computer Science [CMP\_SC] 2050. Co-requisite: Computer Science [CMP\_SC] 3380.

**CMP\_SC 7380. Database Management Systems I. 3 Credits.**

Fundamental concepts of current database systems with emphasis on the relational model. Topics include entity-relationship model, relational algebra, query by example, indexing, query optimization, normal forms, crash recovery, web-based database access, and case studies. Project work involves a modern DBMS, such as Oracle, using SQL. Prerequisite: graduate standing and Computer Science [CMP\_SC] 2050.

**CMP\_SC 7410. Theory of Computation I. 3 Credits.**

An introductory study of computation and formal languages by means of automata and related grammars. The theory and applications of finite automata, regular expressions, contextfree grammars, pushdown automata and Turing machines are examined. May not be counted toward CS MS/PHD. Prerequisite: Mathematics [MATH] 2320.

**CMP\_SC 7430. Compilers I. 3 Credits.**

Introduction to the translation of programming languages by means of interpreters and compilers. Lexical analysis, syntax specification, parsing, error-recovery, syntax-directed translation, semantic analysis, symbol tables for blockstructured languages, and run-time storage organization. May not be counted toward CS MS/PHD. Prerequisite: Mathematics [MATH] 2320.

**CMP\_SC 7450. Principles of Programming Languages. 3 Credits.**

An introduction to the structure, design and implementation of programming languages. Topics include syntax, semantics, data types, control structures, parameter passing, run-time structures, and functional and logic programming. May not be counted toward CS MS/PHD. Prerequisite: Computer Science [CMP\_SC] 2050.

**CMP\_SC 7520. Operating Systems I. 3 Credits.**

Basic concepts, theories and implementation of modern operating systems including process and memory management, synchronization, CPU and disk scheduling, file systems, I/O systems, security and protection, and distributed operating systems. Cannot be counted toward CS MS/PHD. Prerequisites: Computer Science [CMP\_SC] 3050 and Mathematics [MATH] 1700.

**CMP\_SC 7610. Computer Graphics I. 3 Credits.**

Basic concepts and techniques of interactive computer graphics including hardware, software, data structures, mathematical manipulation of graphical objects, the user interface, and fundamental implementation algorithms. Prerequisites: Computer Science [CMP\_SC] 3050 and either Mathematics [MATH] 1500 or 1300 and 1400.



**CMP\_SC 7650. Digital Image Processing. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7850). Fundamentals of digital image processing hardware and software including digital image acquisition, image display, image enhancement, image transforms and segmentation. Prerequisites: graduate standing and Computer Science [CMP\_SC] 2050, Statistics [STAT] 7710 or instructor's consent.

**CMP\_SC 7670. Digital Image Compression. 3 Credits.**

Covers digital image formation, information theory concepts, and fundamental lossless and lossy image compression techniques including bit plane encoding, predictive coding, transform coding, block truncation coding, vector quantization, subband coding and hierarchical coding. Prerequisite: graduate standing and Computer Science [CMP\_SC] 2050.

**CMP\_SC 7720. Introduction to Machine Learning and Pattern Recognition. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7720). This course provides foundation knowledge and methods in machine learning and pattern recognition that address the problem of programming computers to optimize performance by learning from example data or expert knowledge. Prerequisites: Computer Science [CMP\_SC] 2050 and Statistics [STAT] 4710 or instructor's consent. Graded on A/F basis only.

**CMP\_SC 7730. Building Intelligent Robots. 4 Credits.**

(same as Electrical and Computer Engineering [ECE] 7340). Covers the design and development of intelligent machines, emphasizing topics related to sensor-based control of mobile robots. Includes mechanics and motor control, sensor characterization, reactive behaviors and control architectures. Prerequisites: graduate standing and programming experience in one of the following programming languages: Basic, C, C++ or Java.

**CMP\_SC 7750. Artificial Intelligence I. 3 Credits.**

Introduction to the concepts and theories of intelligent systems. Various approaches to creating intelligent systems, including symbolic and computational approaches, insight into the philosophical debates important to understanding AI. Prerequisite: graduate standing and Computer Science [CMP\_SC] 3050.

**CMP\_SC 7770. Introduction to Computational Intelligence. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7870). Introduction to the concepts, models and algorithms for the development of intelligent systems from the standpoint of the computational paradigms of neural networks, fuzzy set theory and fuzzy logic, evolutionary computation and swarm optimization. Graduate Standing Required.

**CMP\_SC 7830. Science and Engineering of the World Wide Web. 3 Credits.**

This course will study the science and engineering of the World Wide Web. We will study the languages, protocols, services and tools that enable the web. Emphasis will be placed on basics and technologies. Prerequisites: graduate standing and Computer Science [CMP\_SC] 3330 and 2830.

**CMP\_SC 7850. Computer Networks I. 3 Credits.**

Introduction to concepts and terminology of data communications and computer networking. Basic protocols and standards, applications of networking, routing algorithms, congestion avoidance, long-haul and local networks. Prerequisite: graduate standing and Computer Science [CMP\_SC] 2210 and Mathematics [MATH] 2320.

**CMP\_SC 7860. Network Security. 3 Credits.**

Principles and practice of cryptography, network security, and computer system security. It includes symmetric and asymmetric cryptography, authentication, security applications such as secure email, IP security, Web security, and system security issues such as intruders, viruses, worms, Trojan horses, and firewalls. Prerequisite: Computer Science [CMP\_SC] 7850 or 4850.

**CMP\_SC 7870. Wireless and Mobile Networks. 3 Credits.**

Concepts and techniques in wireless and mobile networks: cellular concepts, wireless physical layer, wireless MAC protocol, mobility management, power management, wireless network security, wireless telecommunication system, wireless LAN, wireless ad hoc networking, wireless personal area network. Prerequisite: Computer Science [CMP\_SC] 7850 or 4850.

**CMP\_SC 8001. Advanced Topics in Computer Science. 3 Credits.**

Topic may vary from semester to semester. May be repeated upon consent of department. Prerequisite: varies by topic.

**CMP\_SC 8050. Design and Analysis of Algorithms II. 3 Credits.**

Techniques for the design and analysis of correct, efficient algorithms. Topics include graph, geometric, and algebraic/ numeric algorithms, NP-completeness, and parallel algorithms. Prerequisite: Computer Science [CMP\_SC] 4050.

**CMP\_SC 8085. Problems in Computer Science. 1-4 Credit.**

Independent study project work with a professor in computer science. Prerequisite: instructor consent.

**CMP\_SC 8090. Computational Geometry. 3 Credits.**

Studies fundamental geometric problems within the framework of analysis of algorithms: convex hull algorithms in the plane and in general dimension, Voronoi diagram construction and applications to the solution of proximity problems, intersection problems, and geometric searching problems. Prerequisites: Computer Science [CMP\_SC] 4050 and Mathematics [MATH] 2300, or instructor's consent.

**CMP\_SC 8110. Problem Solving in Bioinformatics. 3 Credits.**

(Same as Informatics Institute [INFOINST] 8010). The course covers a variety of bioinformatics research topics such as biological sequence comparison, protein structure prediction, protein and gene function prediction, and inference and modeling of biological networks. Prerequisites: Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010. Graduate Standing Required. Graded on A/F basis only.

**CMP\_SC 8120. Structural Bioinformatics of Proteins, Complexes, System. 3 Credits.**

(same as MU Informatics Institute [INFOINST] 8210). Main course objective is to provide an introduction to the state-of-the-art methods in structural bioinformatics. The course will cover the methods that are applied to a wide range of biomolecular objects from protein domains and small proteins to large biological systems. Graded on A/F basis only. Prerequisites: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010; Computer Science [CMP\_SC] 4050/7050 is preferable.

**CMP\_SC 8130. Computational Genomics. 3 Credits.**

(same as MU Informatics Institute [INFOINST] 8310). This course introduces computational concepts and methods of genomics to students. The course covers genome structure, database, sequencing, assembly, annotation, gene and RNA finding, motif and repeats identification, single nucleotide polymorphism, and epigenomics. Graded on A/F basis only.

Prerequisites: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010.

**CMP\_SC 8150. Integrative Methods in Bioinformatics. 3 Credits.**  
(same as MU Informatics Institute [INFOINST] 8150), Introduces the most popular experimental methods from the point of view of the information sources that can be used. Students will use data obtained directly from biological experiments and learn how to suggest new experiments to improve results. Prerequisite: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010. Graded on A/F basis only.

**CMP\_SC 8160. Content Management in Biomedical Informatics. 3 Credits.**  
(same as MU Informatics Institute [INFOINST] 8860). This course introduces theory and techniques for content extraction, indexing, and retrieval of biomedical media databases. Topics include biomedical media databases, feature extraction methods, advanced database indexing structures, query methods, and result visualization. Graded on A/F basis only. Prerequisites: Computer Science [CMP\_SC] 7380, MU Informatics Institute (INFOINST) 7010.

**CMP\_SC 8180. Machine Learning Methods for Biomedical Informatics. 3 Credits.**  
(same as MU Informatics Institute [INFOINST] 8880). Teaches statistical machine learning methods and applications in biomedical informatics. Covers theories of advanced statistical machine learning methods and how to develop machine learning methods to solve biomedical problems. Prerequisite: Computer Science [CMP\_SC] 7050 and MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010 or 7005. Graded on A/F basis only.

**CMP\_SC 8190. Computational Systems Biology. 3 Credits.**  
(same as MU Informatics Institute [INFOINST] 8390). This course covers current theories and methods in the modeling and analysis of high-throughput experiments such as microarrays, proteomics, and metabolomics. Topics include the inference of causal relations from experimental data and reverse engineering of cellular systems. Graded on A/F basis only. Prerequisites: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010; MU Informatics Institute [INFOINST] 8010.

**CMP\_SC 8250. Digital Hardware Systems Design. 3 Credits.**  
(same as Electrical and Computer Engineering [ECE] 8250). Characteristics and parameters of various hardware subsystems, including main memory, auxiliary memory, arithmetic units, card equipment, etc., and principles of organization into efficient system. Prerequisite: Computer Science [CMP\_SC] 4250.

**CMP\_SC 8270. Computer Architecture II. 3 Credits.**  
Study of array processors, multiprocessors, multicomputers, and networked computing systems. Topics include architectures, interconnection networks, communication mechanisms, distributed memories and security. Introduction to parallel algorithm design. Prerequisites: Computer Science [CMP\_SC] 4210 or Electrical and Computer Engineering [ECE] 4210.

**CMP\_SC 8320. Software Engineering II. 3 Credits.**  
Further discussion of software development methodology. Prerequisite: Computer Science [CMP\_SC] 4320.

**CMP\_SC 8330. Object Oriented Design II. 3 Credits.**  
Software system design using classes and their properties of abstraction, inheritance, dynamic binding, and polymorphism. Focus on object-

oriented design of systems such as windows, graphics systems, and operating system. Prerequisite: Computer Science [CMP\_SC] 4330.

**CMP\_SC 8370. Data Mining and Knowledge Discovery. 3 Credits.**  
Course topics include an introduction to fundamental concepts, data mining techniques from machine learning and pattern recognition areas, association rules, web mining, spatial mining, temporal mining, multimedia/multimodal database mining, and database mining, and geospatial information mining. Prerequisites: Computer Science [CMP\_SC] 7380.

**CMP\_SC 8380. Database Management Systems II. 3 Credits.**  
Further study in the theory, design, organization and implementation of databases and database management systems. Topics include: high-dimensional database indexing, content-based retrieval from image and video databases, object-relational databases, object-oriented databases, and data mining. Prerequisite: Computer Science [CMP\_SC] 7380.

**CMP\_SC 8390. Information Indexing and Retrieval. 3 Credits.**  
Theory and techniques for the modeling, indexing, and retrieval of text-based and multimedia databases. Topics include introduction to different information retrieval models, retrieval evaluation, query languages, query operations, and indexing/searching methods. Prerequisites: Computer Science [CMP\_SC] 2050 and 2110.

**CMP\_SC 8410. Theory of Computation II. 3 Credits.**  
An advanced study of computational and formal languages by means of automata and related grammars. Turing machines, decidability, computability, computational complexity, language translation, and recent trends in automata theory. Prerequisite: Computer Science [CMP\_SC] 7410.

**CMP\_SC 8430. Compilers II. 3 Credits.**  
Further study of the compilation process. Compiler generation tools, parsing methods, code generation, data-flow analysis, code optimization, error handling, discussion of programming language features and their relationship to the compilation process. Prerequisite: Computer Science [CMP\_SC] 7430.

**CMP\_SC 8440. Information Security: A Language-Based Approach. 3 Credits.**  
This course focuses on language-based techniques for information flow security. Students will gain a solid background in information security, be encouraged to do further research and be exposed to important/promising trends in state-of-the-art computer security. Prerequisites: Computer Science [CMP\_SC] 4450/7450.

**CMP\_SC 8520. Operating Systems II. 3 Credits.**  
Discusses concurrent processes, distributed/network operating systems; models of processor scheduling, memory management and resource allocation, performance measurement, evaluation and simulation methodology; queuing models; security and reliability. Prerequisites: Computer Science [CMP\_SC] 4220.

**CMP\_SC 8610. Computer Graphics II. 3 Credits.**  
Further study of computer graphics, focused on 3-D graphics, transformations, geometric and surface modeling, color models, visible surface determination, lighting and shading, standard graphics software (Phigs/OpenGL). Selected current topics in graphics such as visualization, animation and realism. Prerequisite: Computer Science [CMP\_SC] 7610.

**CMP\_SC 8620. Physically Based Modeling and Animation II. 3 Credits.**

This course introduces students to physical based modeling and animation methodology for computer graphics and related fields such as computer vision, visualization, biomedical imaging and virtual reality. We will explore current research issues and will cover associated computational methods for simulating various visually interesting physical phenomena. This course should be appropriate for graduate students in all areas as well as advanced undergraduate students. Prerequisites: Computer Science [CMP\_SC] 4610/7610.

**CMP\_SC 8630. Data Visualization. 3 Credits.**

Data visualization broadly covers transforming multidimensional and timevarying datasets to dynamic visual representations and encodings that facilitate exploratory data mining, knowledge discovery, improved understanding, summarization, structural modeling, collaboration and decision making using interactive methods. Prerequisites: Computer Science [CMP\_SC] 4610/7610 or instructor's consent.

**CMP\_SC 8650. Advanced Image Processing. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8855). This course covers advanced topics in image understanding including multispectral multimodal imaging, motion estimation, texture analysis, geometric level set methods. Prerequisites: Computer Science [CMP\_SC] 4650/7650 or instructor's consent. Graduate Standing Required.

**CMP\_SC 8660. Multimedia Security. 3 Credits.**

This course offers a comprehensive coverage of the theoretical foundation of multimedia security technologies, including encryption, authentication, digital watermarking, key management, copy control, fingerprinting/tracing, digital media forensics, and biometrics, provides an in-depth study of the state-of-the-art digital rights management systems and the underlying security technologies. Prerequisites: Computer Science [CMP\_SC] 4670 or 4650; graduate standing, instructor's consent. Graded on A/F basis only.

**CMP\_SC 8670. Multimedia Communication. 3 Credits.**

Topics covered may include multimedia networking and network technologies as pertaining to multimedia communications; multimedia applications such as video conferencing, video-on-demand broadcasting, and web-based distance learning; wireless video and future generation wireless video communication systems. Prerequisite: Computer Science [CMP\_SC] 4670 and 4850 or instructor's consent.

**CMP\_SC 8690. Computer Vision. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8690). This course introduces students to the fundamental problems of computer vision, the main concepts and the techniques used to solve such problems. It will enable graduate and advanced undergraduate students to solve complex problems and make sense of the literature in the area. Prerequisite: Electrical and Computer Engineering [ECE] 4655/7655 or Computer Science [CMP\_SC] 4650/7650 or instructor's consent. Graded on A/F basis only.

**CMP\_SC 8725. Supervised Learning. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8725). This course introduces the theories and applications of advanced supervised machine learning methods. It covers hidden Markov model and expectation maximization (EM) algorithms, probabilistic graphical models, non-linear support vector machine and kernel methods. The course emphasizes both the theoretical underpinnings of the advanced supervised learning methods and their applications in the real world. Prerequisites: Computer Science [CMP\_SC] /Electrical and Computer Engineering [ECE]

4720/7720 graduate standing or instructor's consent. Graded on A/F basis only.

**CMP\_SC 8735. Unsupervised Learning. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8735). Theoretical and practical aspects of unsupervised learning including topics of expectation maximization (EM), mixture decomposition, clustering algorithms, cluster visualization, and cluster validity. Prerequisite: Computer Science [CMP\_SC] /Electrical and Computer Engineering [ECE] 4720/7720 or consent of instructor. Graded on A/F basis only.

**CMP\_SC 8750. Artificial Intelligence II. 3 Credits.**

Further discussion of theories and techniques of artificial intelligence. Investigating state-of-the-art systems with capabilities to perceive, reason, learn and react intelligently to their environment. Prerequisites: Computer Science [CMP\_SC] 4750/7750 or instructor's consent.

**CMP\_SC 8760. Pattern Recognition. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8820). Decision functions, crisp and fuzzy clustering methods, statistical pattern recognition methods, Bayesian classifiers, error probabilities, estimation of density functions, perceptrons, least-mean-square algorithms, feature selection, dimensionality reduction and syntactic pattern recognition. Prerequisites: Computer Science [CMP\_SC] 4050, Statistics [STAT] 4710.

**CMP\_SC 8770. Neural Networks. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8890). The course will consider computing systems based on neural networks and learning models along with implementations and applications of such systems. Prerequisites: Computer Science [CMP\_SC] 4870/7870 or instructor's consent.

**CMP\_SC 8790. Filtering, Tracking and Data Fusion. 3 Credits.**

This course will cover theory and applications of rigorous and efficient techniques for determining the state of an observed system from a series of imperfect observations or measurements. Specific topics to be covered include semidefinite matrix theory, the Kalman filter, the Unscented Transform, Covariance Intersection and related techniques. Applications of these techniques include head and hand tracking in virtual reality systems, robotics, and distributed information fusion. Prerequisites: Computer Science [CMP\_SC] 2050, Mathematics [MATH] 2300 or Linear Algebra or Matrix Theory; graduate standing required.

**CMP\_SC 8850. Computer Networks II. 3 Credits.**

In-depth analysis and evaluation of computer networking architectures, protocols and algorithms, network security, distributed database and computational networks, routing and congestion control, domains and internetworking. Prerequisite: Computer Science [CMP\_SC] 7850.

**CMP\_SC 8860. Parallel and Distributed Processing. 3 Credits.**

This course covers basic issues of parallel and distributed processing, including parallel and distributed architectures and models, parallel programming, and parallel algorithms and applications. Prerequisites: Computer Science [CMP\_SC] 4050.

**CMP\_SC 8870. Modeling and Management of Uncertainty. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8870). Theoretical and practical issues in the modeling and management of uncertainty. Topics include probabilistic uncertainty, belief theory and fuzzy set theory. Applications to computer vision, pattern recognition and expert systems. Prerequisites: ECE 4870/7870 or CMP\_SC 4770/7770 or instructor's consent. Graduate standing required. Graded on A-F basis only.

**CMP\_SC 8880. Wireless Embedded Systems. 3 Credits.**

This course introduces wireless embedded systems and focuses on the nature of computation and communication needed to design large-scale, distributed, and wirelessly connected embedded systems. We will study emerging technology and standards by reading papers and doing projects on real systems. Prerequisites: Computer Science [CMP\_SC] 4050 and 4850 or instructor's consent.

**CMP\_SC 8980. Research Masters Project in Computer Science. 1-99 Credit.**

Investigation and research of a topic, not leading to a thesis. Graded on S/U basis only. Prerequisite: departmental consent.

**CMP\_SC 8990. Research-Masters Thesis Computer Science. 1-99 Credit.**

Prerequisite: advisor's consent. Graded on S/U basis only.

**CMP\_SC 9001. Advanced Topics in Computer Science - PhD. 1-4 Credit.**

New and current technical developments in computer science. For PhD students.

**CMP\_SC 9990. Research-Doctoral Dissertation Computer Science. 1-99 Credit.**

Prerequisite: advisor's consent. Graded on S/U basis only.

## **Dermatology (DERM)**

**DERM 6233. ABS Dermatology Research. 5 Credits.**

ABS Dermatology Research.

**DERM 6235. ABS Dermatology Research and Review. 5-10 Credit.**

ABS Dermatology Research and Review.

**DERM 6450. Dermatology I. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: The Dermatology rotation is designed to provide the medical student with a broad general base in clinical dermatology for the non-dermatologist. During the rotation the student should: Enhance the visual diagnostic skills and related reasoning used in dermatology; Become familiar with a select list of dermatologic conditions commonly seen and best treated by the non-dermatologist; Gain familiarity with certain dermatologic conditions which require a high index of suspicion by all physicians because of their danger to life or risks to public health; Become familiar with dermatologic treatment regimens for the non-dermatologist and guidelines for appropriate referral of cases; Learn appropriate use of both systemic and topical dermatologic medications; Learn basic punch, shave, and excisional biopsy techniques; Become proficient in skin surveillance, especially early detection of skin cancer. Evaluations: Students are evaluated using a standard evaluation. The student's knowledge of subject matter is evaluated in the following settings: informal discussion during clinics, ward rounds, inpatient consultation rounds and scheduled conferences. A slide (Kodachrome) practical and written examination at the end of the block will be administered at UMC on the last day of the block. Material covered is from the student slide set given in CD format, the AAD Core Curriculum website ([www.aad.org/education/titlepage.htm](http://www.aad.org/education/titlepage.htm)), weekly student lectures, and Unknowns Conference. Notes: CURRICULUM: This four-week rotation consists of participation in the various dermatology clinics, attendance at conferences, use of the self-learning facilities in the learning center, and participation in the consultation process. Most students have concluded that four weeks of dermatology are quite valuable. For select

students we may encourage a second four-week elective, Dermatology II. Those considering a career in dermatology may wish to take eight weeks of dermatology, either at our institution or in combination with a rotation away. 1. Dermatology Clinic Outpatient dermatology is an integral and important part of the student's experience on this rotation. Students participate in the evaluation of patients with skin disease at the University Hospital, the Harry S Truman Veterans Hospital and the Ellis Fischel Cancer Center. 2. Dermatology Inpatient and Consultation Service: On the dermatology inpatient and consultation service, students may participate in the evaluation and management of patients with complex, often serious, dermatologic conditions under the supervision of the dermatology ward resident, the dermatology chief resident and the attending physician. 3. Dermatology Unknowns Conferences: these conferences feature a "show and tell" slide format. A divisional slide show conference is held once weekly, and a separate student-oriented slide show is also held once weekly. Students attend both. A wide variety of dermatologic disorders are reviewed with emphasis on scholarly knowledge of the diseases. 4. Recommended Text: American Academy of Dermatology Student Core Curriculum website, [www.aad.org/education/titlepage.htm](http://www.aad.org/education/titlepage.htm) Dermatology for the House Officer by Peter J. Lynch Color Atlas and Synopsis of Clinical Dermatology by T.B. Fitzpatrick 5. Dermatology Learning Center: The Department of Dermatology maintains a large file of slides illustrating a wide variety of dermatologic conditions. In addition, each student is given a CD to be used while on the rotation. Also, pertinent articles and texts are available for the student's perusal.

**DERM 6750. Dermatology I - Rural. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: The Dermatology rotation is designed to provide the medical student with a broad general base in clinical dermatology for the non-dermatologist. During the rotation the student should: Enhance the visual diagnostic skills and related reasoning used in dermatology. Become familiar with a select list of dermatologic conditions commonly seen and best treated by the non-dermatologist. Gain familiarity with certain dermatologic conditions which require a high index of suspicion by all physicians because of their danger to life or risks to public health. Become familiar with dermatologic treatment regimens for the non-dermatologist and guidelines for appropriate referral of cases. Learn appropriate use of both systemic and topical dermatologic medications. Learn basic punch, shave, and excisional biopsy techniques. Become proficient in skin surveillance, especially early detection of skin cancer. Dermatology Clinic Outpatient dermatology is an integral part of the student's experience on this rotation. Students participate in the evaluation of patients with skin disease at one of our community based clinics in Rolla, MO with Dr. Van Stoecker. Dermatology Inpatient and Consultation Service On the dermatology inpatient and consultation service, students may participate in the evaluation and management of patients with complex, often serious, dermatologic conditions under the supervision of the attending physician. Recommended Text The text recommended for students rotating through Dermatology is Dermatology for the House Officer, 3rd edition by Peter J. Lynch (Williams and Wilkins), Color Atlas and Synopsis of Clinical Dermatology by T.B. Fitzpatrick, and the American Academy of Dermatology Student Core Curriculum website, [www.aad.org/education/titlepage.htm](http://www.aad.org/education/titlepage.htm). Dermatology Learning Center A large file of slides illustrating a wide variety of dermatologic conditions is provided. In addition, each student is given a CD to be used while on the rotation, arranged to illustrate specific topics in dermatology for self-study. Also, pertinent articles and texts are available for the student's perusal. Student lectures, based on the Lynch text, are available for your review at any time. Evaluations: Students are evaluated using a

standard evaluation form. The student's knowledge of subject matter is evaluated in the following settings: Informal discussion during clinics, ward rounds, inpatient consultation rounds and scheduled conferences. A slide (Kodachrome) practical and written examination at the end of the block will be administered at UMC on the last day of the block. Material covered is from the student slide set given in CD format, student lectures and the AAD Core Curriculum website. Contact the UMC dermatology office at 882-8578 for time and location of exam. Final grades will be determined in the following manner: Grade H - Requires outstanding clinical performance and a score of 90 or better on the final exam. Grade L - Requires superior clinical performance and a score of 80 or better on the final exam. Grade P - Requires satisfactory clinical performance and a score of 70 or better on the final exam. Notes: This Mid-Missouri AHEC-affiliated rotation is in Rolla, Missouri, a town of 17,000 in the south central Missouri Ozarks. This two physician practice is located near Phelps County Regional Medical Center, a 258-bed, multiple-service hospital including surgery, an emergency room, obstetrical deliveries and general medical and pediatric patients. Students may also see patients in the hospital's emergency room and at nursing homes.

#### **DERM 6856. Dermatology II. 5 Credits.**

Prerequisites: Successful completion of Dermatology I and consent from Course Director. Goals/Objectives: This elective rotation is an expansion of the objective goals outlined for Dermatology I. The student is expected to expand the depth and breadth of his/her dermatology experiences and knowledge. Enhance the visual diagnostic skills and related reasoning used in dermatology. Become familiar with a select list of dermatologic conditions commonly seen and best treated by the non-dermatologist. Gain familiarity with certain dermatologic conditions which require a high index of suspicion by all physicians because of their danger to life or risks to public health. Become familiar with dermatologic treatment regimens for the non-dermatologist and guidelines for appropriate referral of cases. Learn appropriate use of both systemic and topical dermatologic medications. Learn basic punch, shave, and excisional biopsy techniques. Become proficient in skin surveillance, especially early detection of skin cancer. As Dermatology II is an extension of the Dermatology I curriculum, Dermatology II students are expected to master the above objectives. In addition, they are expected to expand their clinical skills related to the diagnosis and treatment of dermatologic diseases and they will have increased responsibilities for patient education. It is expected that they will further their surgical skills including biopsies, simple excisions, and basic cryotherapy. They will also become proficient in basic laboratory procedures including KOH and scabies prep. Evaluations: Students are evaluated using a standard evaluation. Dermatology II students will not have a written examination. They will be required to present a brief presentation (30 minutes) on a dermatologic topic of their choice. Notes: CURRICULUM: Clinic, inpatient, and conference involvement as in Dermatology I will be supplemented by a greater degree of involvement in patient care and responsibility. Derm II students will have the opportunity to focus on a specialized area of dermatology should they wish, such as dermatopathology, cutaneous micrographic surgery, or phototherapy. A research project may be initiated during this block at the discretion of the student and a faculty mentor.

## **Diagnostic Medical Ultrasound (DMU)**

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**DMU 1000. Introduction to Diagnostic Medical Ultrasound. 1 Credit.**  
Introduction to the profession of diagnostic medical ultrasound. Imaging characteristics, educational requirements, professional trends. Observation opportunities. Graded on S/U basis only.

**DMU 4001. Topics in Diagnostic Medical Ultrasound. 1-99 Credit.**  
Organized study of selected topics in medical ultrasound. Topics may vary. Graded on A/F basis only. May be repeated for credit. Prerequisites: restricted to Diagnostic Medical Ultrasound undergraduate students; program director's consent.

**DMU 4085. Problems in Diagnostic Medical Ultrasound. 1-99 Credit.**  
Independent study leading to a special project or paper. Graded on A/F basis only. May be repeated for credit. Prerequisites: restricted to Diagnostic Medical Ultrasound undergraduate students only; program director's consent.

**DMU 4200. Principles of Diagnostic Medical Ultrasound. 3 Credits.**  
Principles and history of ultrasound, ultrasound equipment, sonographic techniques, aspects of patient care. Prerequisites: departmental consent.

**DMU 4234. Clinical Pathophysiology. 3 Credits.**  
Abnormal function of organ systems in the presence of disease; clinical manifestations and medical management.

**DMU 4309. Normal Ultrasound Clinical. 5 Credits.**  
Integration of ultrasound instrumentation and clinical practice in a laboratory setting. Interaction between the sonographer, equipment and patient. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4313 and 4315; instructor's consent.

**DMU 4311. Pathological Images of Ultrasound. 3 Credits.**  
Disease presentation in ultrasound imaging. Practical aspects of ultrasound scanning techniques in pathology. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4200, 4312 and 4315; instructor's consent.

**DMU 4312. Sectional Anatomy. 3 Credits.**  
(same as Radiological Science [RA\_SCI] 4110). A study of human anatomy using the sectional approach; anatomical structures will be related to modern medical imaging techniques. Prerequisite: instructor's consent.

**DMU 4313. Ultrasound Physics. 3 Credits.**  
Principles of diagnostic ultrasound physics. Sound wave characteristics, tissue interaction, power intensity, and Doppler physics. Prerequisites: Mathematics [MATH] 1100, Chemistry [CHEM] 1100 or 1320, Physics [PHYSCS] 1210, and departmental consent.

**DMU 4314. Abdominal Ultrasound. 5 Credits.**  
Differentiation between normal and pathological ultrasound studies of the abdomen. Differential diagnosis of pathological states. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4309 and 4311; instructor's consent.

**DMU 4315. Ultrasound Instrumentation. 3 Credits.**  
Integration of ultrasound physics and instrumentation components in a laboratory setting. Practice in modes of operation and safety. Prerequisite: Diagnostic Medical Ultrasound [DMU] 4200; instructor's consent.

**DMU 4318. Gynecology Ultrasound. 3 Credits.**  
Study of normal and abnormal gynecological ultrasound anatomy. Distinction between normal and pathological states and ultrasound differential diagnosis. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4309 and 4311.

**DMU 4320. Obstetrics Ultrasound. 3 Credits.**

Study of normal and abnormal obstetrical ultrasound anatomy. Distinction between normal and pathological OB ultrasound studies with emphasis on differential diagnosis. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4309 and 4311; instructor's consent.

**DMU 4322. Superficial Organs Ultrasound. 3 Credits.**

Ultrasound evaluation and diagnosis of normal and abnormal superficial organs; thyroid gland, testes, breasts, soft tissues and musculoskeletal. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4309 and 4311; instructor's consent.

**DMU 4325. Ultrasound Clinical Pharmacology and Contrast Agents. 3 Credits.**

Study of the biophysical, biochemical and complete action of ultrasound contrast agents and other drugs used in Diagnostic Medical Ultrasound and their pharmacodynamics.

**DMU 4326. Vascular Ultrasound Physics, Instrumentation and Hemodynamics. 3 Credits.**

Study of vascular principles and fundamentals including physics and instrumentation. Emphasis on ultrasound wave characteristics, Doppler principles, tissue interaction and hemodynamics. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4313 and 4315; instructor's consent.

**DMU 4330. Vascular Ultrasound Lab. 3 Credits.**

Vascular ultrasound scanning techniques, protocols, measurements, film/video critique, and Plethysmography in a clinical lab setting. Prerequisite: Diagnostic Medical Ultrasound [DMU] 4312, and 4326; instructor's consent.

**DMU 4332. Vascular Ultrasound. 4 Credits.**

Vascular ultrasound for normal and pathological processes: study of disease, correlation of patients' clinical data and ultrasound findings used in differential diagnosis. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4311, 4322, and 4326 or instructor's consent.

**DMU 4338. Cardiac Ultrasound, Principles and Hemodynamics. 3 Credits.**

Study of cardiac ultrasound fundamentals including: wave characteristics, principles of 2-D/3-D/4-D imaging, M-mode, and Doppler, cardiac anatomy and physiology, embryology, evaluation methods and hemodynamics. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4313, 4315, instructor's consent. Graded on A/F basis only.

**DMU 4342. Adult Cardiac Ultrasound. 5 Credits.**

Provides principles of diagnostic adult cardiac ultrasound in relation to pathology, further presenting the practical aspects of scanning techniques, exam critique, patient care in relation to cardiac US exams. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4313, 4315 and 4338. Instructor's permission required. Graded A-F only.

**DMU 4941. Ultrasound Clinical I. 7 Credits.**

Application of medical ultrasound in supervised clinical settings. Decisions regarding diagnosis, patient handling and imaging. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4312, 4309 and 4311 and instructor's consent.

**DMU 4943. Ultrasound Clinical III. 6 Credits.**

Final clinical application of general medical ultrasound practicum in supervised clinical settings. Further enhancement of practice, decision making, patient handling, image processing and case studies. Prerequisite: Diagnostic Medical Ultrasound [DMU] 4993 and instructor's consent.

**DMU 4944. Vascular Ultrasound Clinical IV. 7 Credits.**

Application of diagnostic vascular ultrasound in supervised clinical settings: practice, decision making, patient handling and image processing. Prerequisite: Diagnostic Medical Ultrasound [DMU] 4326 and instructor's consent.

**DMU 4945. Cardiac Ultrasound Clinical V. 6 Credits.**

Application of ultrasonography in real clinical settings for learning, practicing and decision making regarding, patient handling and imaging process with students supervised in a clinical setting. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4313, 4315, 4944. Instructor and Departmental permission required. Graded A-F only.

**DMU 4946. Cardiac Ultrasound Clinical VI. 6 Credits.**

Further application of ultrasonography for continuation of learning, practicing and decision making, patient handling and imaging process with students supervised in a clinical setting. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4313, 4315, 4338 and 4945. Instructor and Departmental permission required. Graded A-F only.

**DMU 4993. Ultrasound Clinical II. 8 Credits.**

Application of medical ultrasound in supervised clinical settings with practice and decision making related to ultrasound diagnosis, patient handling and image processing. Prerequisite: Diagnostic Medical Ultrasound [DMU] 4941; instructor's consent.

**DMU 7200. Diagnostic Medical Ultrasound Principles and Patient Care. 3 Credits.**

Introduction diagnostic medical ultrasound principles including history, development, ultrasound physics - equipment fundamentals. Provides introduction to concepts of sonographic techniques, positioning, image critique, aspects of patient care and professional organizations. Prerequisites: Diagnostic Medical Ultrasound [DMU] 1000; graduate standing and instructor's consent. Graded A-F basis only.

**DMU 7234. Clinical Pathophysiology. 3 Credits.**

(same as Physical Therapy [PH\_THR] 7270). Abnormal function of organ systems in the presence of disease; clinical manifestations and medical management.

**DMU 7309. Normal Ultrasound Clinical. 5 Credits.**

Integration of ultrasound instrumentation and clinical practice in a laboratory setting. Interaction between the sonographer, equipment and patient. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7313 and 7315; instructor's consent.

**DMU 7311. Pathological Images Ultrasound. 3 Credits.**

Disease presentation in ultrasound imaging. Practical aspects of ultrasound scanning techniques in pathology. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 4200, 7312 and 7315; instructor's consent.

**DMU 7312. Sectional Anatomy. 3 Credits.**

(same as Radiological Science [RA\_SCI] 4110). A study of human anatomy using the sectional approach; anatomical structures will be related to modern medical imaging techniques. Prerequisite: graduate standing and instructor's consent.

**DMU 7313. Ultrasound Physics. 3 Credits.**

Principles of diagnostic ultrasound physics. Sound wave characteristics, tissue interaction, power intensity, and Doppler physics. Prerequisites: graduate standing and Mathematics [MATH] 1100, Chemistry [CHEM] 1100 or 1320, Physics [PHYSICS] 1210, and departmental consent.

**DMU 7314. Abdominal Ultrasound. 5 Credits.**

Differentiation between normal and pathological ultrasound studies of the abdomen. Differential diagnosis of pathological states. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7309 and 7311; instructor's consent.

**DMU 7315. Ultrasound Instrumentation. 3 Credits.**

Integration of ultrasound physics and instrumentation components in a laboratory setting. Practice in modes of operation and safety. Prerequisite: graduate standing and Diagnostic Medical Ultrasound [DMU] 4200; instructor's consent.

**DMU 7318. Gynecology Ultrasound. 3 Credits.**

Study of normal and abnormal gynecological ultrasound anatomy. Distinction between normal and pathological states and ultrasound differential diagnosis. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7309 and 7311.

**DMU 7320. Obstetrics Ultrasound. 3 Credits.**

Study of normal and abnormal obstetrical ultrasound anatomy. Distinction between normal and pathological OB ultrasound studies with emphasis on differential diagnosis. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7309 and 7311; instructor's consent.

**DMU 7322. Superficial Organs Ultrasound. 3 Credits.**

Ultrasound evaluation and diagnosis of normal and abnormal superficial organs; thyroid gland, testes, breasts, soft tissues and musculoskeletal. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7309 and 7311; instructor's consent.

**DMU 7325. Ultrasound Clinical Pharmacology and Contrast Agents. 3 Credits.**

Study of the biophysical, biochemical and complete action of ultrasound contrast agents and other drugs used in DMU and their pharmacodynamics. Prerequisite: graduate standing.

**DMU 7326. Vascular Ultrasound Physics, Instrumentation and Hemodynamics. 3 Credits.**

Study of vascular principles and fundamentals including physics and instrumentation. Emphasis on ultrasound wave characteristics, Doppler principles, tissue interaction and hemodynamics. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7313 and 7315; instructor's consent.

**DMU 7330. Vascular Ultrasound Lab. 3 Credits.**

Vascular ultrasound scanning techniques, protocols, measurements, film/video critique, and Plethysmography in a clinical lab setting. Prerequisite: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, and 7326; instructor's consent.

**DMU 7332. Vascular Ultrasound. 4 Credits.**

Vascular ultrasound for normal and pathological processes: study of disease, correlation of patients' clinical data and ultrasound findings used in differential diagnosis. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7311, 7322, and 7326 or instructor's consent.

**DMU 7338. Cardiac Ultrasound, Principles and Hemodynamics. 3 Credits.**

Study of cardiac ultrasound fundamentals including: wave characteristics, principles of 2-D/3-D/4-D imaging, M-mode, and Doppler, cardiac anatomy and physiology, embryology, evaluation methods and hemodynamics. Prerequisites: Diagnostic Medical Ultrasound [DMU] 4313, 4315, instructor's consent. Graded on A/F basis only.

**DMU 7342. Adult Cardiac Ultrasound. 5 Credits.**

Study of adult cardiac ultrasound for normal and pathological processes. Differential diagnosis of cardiac disease through correlation of patients' clinical data and ultrasound findings. Prerequisites: Diagnostic Medical Ultrasound [DMU] 7312, 7313 and 7315 and instructor's consent.

**DMU 7941. Ultrasound Clinical I. 7 Credits.**

Application of medical ultrasound in supervised clinical settings. Decisions regarding diagnosis, patient handling and imaging. Prerequisites: graduate standing and Diagnostic Medical Ultrasound [DMU] 7312, 7309 and 7311 and instructor's consent.

**DMU 7943. Ultrasound Clinical III. 6 Credits.**

Final clinical application of general medical ultrasound practicum in supervised clinical settings. Further enhancement of practice, decision making, patient handling, image processing and case studies. Prerequisite: graduate standing and Diagnostic Medical Ultrasound [DMU] 7993 and instructor's consent.

**DMU 7944. Vascular Ultrasound Clinical IV. 7 Credits.**

Application of diagnostic vascular ultrasound in supervised clinical settings: practice, decision making, patient handling and image processing. Prerequisite: Diagnostic Medical Ultrasound [DMU] 7326 and instructor's consent.

**DMU 7945. Cardiac Ultrasound Clinical V. 6 Credits.**

Application of diagnostic cardiac ultrasound in supervised clinical settings: practice and decision making regarding echocardiography, patient handling and image processing. Prerequisites: Diagnostic Medical Ultrasound [DMU] 7313 and 7315 and instructor's consent.

**DMU 7946. Cardiac Ultrasound Clinical VI. 6 Credits.**

Further enhancement of diagnostic cardiac ultrasound in supervised clinical settings: practice and decision making regarding echocardiography, patient handling and image processing. Prerequisite: Diagnostic Medical Ultrasound [DMU] 7945.

**DMU 7993. Ultrasound Clinical II. 8 Credits.**

Application of medical ultrasound in supervised clinical settings with practice and decision making related to ultrasound diagnosis, patient handling and image processing. Prerequisite: graduate standing and Diagnostic Medical Ultrasound [DMU] 7941; instructor's consent.

**DMU 8001. Topics in Diagnostic Medical Ultrasound. 1-3 Credit.**

Organized study of selected topics. Topic may vary. Prerequisite: restricted to students enrolled in the DMU program only.

**DMU 8050. Research in Diagnostic Medical Ultrasound. 1-99 Credit.**

Research not leading to a thesis or dissertation. Graded on an A/F basis only. Prerequisite: restricted to students enrolled in the DMU program only.

**DMU 8085. Problems in Diagnostic Medical Ultrasound. 1-99 Credit.**

Independent study of a special project involving clinical applications or research. Topic may vary. Prerequisite: restricted to students enrolled in the DMU program only.

**DMU 8090. Research in Diagnostic Medical Ultrasound. 1-99 Credit.**

Research leading to a thesis or dissertation. Graded on an S/U basis only. Prerequisite: restricted to students enrolled in the DMU program only.

**DMU 8346. Pediatric Cardiac Ultrasound. 4 Credits.**

Study of pediatric cardiac ultrasound for normal and pathological processes. Differential diagnosis of cardiac disease through correlation

of patients' clinical data and ultrasound findings. Prerequisite: Diagnostic Medical Ultrasound [DMU] 7342 and instructor's consent.

**DMU 8947. Applied Clinical Research & Practicum. 5-8 Credit.**

Clinical research application of cardiovascular & general ultrasound in clinical environment: clinical research, practicum, decision making, patient handling, and image processing. Prerequisites: Diagnostic Medical Ultrasound [DMU] 7944, 7946, instructor's consent. Graded on A/F basis.

## **Economics (ECONOM)**

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**ECONOM 1014. Principles of Microeconomics. 3 Credits.**

A basic examination of the economy at the individual consumer, firm and market level. Simple economic models used to analyze the workings of the economy. Topics include opportunity costs, gains from trade, efficiency and markets, non-competitive markets, game theory, the importance of free trade, the markets response to economic shocks and the effect of government intervention. Not open to students who have completed Economics [ECONOM] 1024, 1051, or Agricultural Economics [AG\_EC] 1041.

**ECONOM 1015. Principles of Macroeconomics. 3 Credits.**

Macroeconomics generally refers to a collection of questions about how scarcity affects a collection of people interacting with one another. In this course, our focus is on understanding how scarcity affects welfare of a nation. Topics include Gross Domestic Product, government spending and taxation, economic growth, monetary and fiscal policy, unemployment and inflation, and exchange rates. Not open to students who have completed Economics [ECONOM] 1051 or Agricultural Economics [AG\_EC] 1042. Prerequisites: Economics [ECONOM] 1014 or 1024.

**ECONOM 1024. Fundamentals of Microeconomics. 3 Credits.**

This course uses mathematical reasoning to provide an elementary quantitative introduction to fundamental concepts in microeconomics. It uses college algebra and simple geometric concepts to describe the behavior of economic units, such as consumers, firms and resource owners, and to depict their interaction through production and exchange in perfect and imperfect markets. Not open to students who have completed Economics [ECONOM] 1014, 1051, or Agricultural Economics [AG\_EC] 1041. Prerequisite: Mathematics [MATH] 1100/1120 or equivalent with grade of C or better. Math Reasoning Proficiency Course.

**ECONOM 1051. General Economics. 5 Credits.**

One semester course covering similar material as covered in ECONOM 1014 and ECONOM 1015. Topics include opportunity costs, gains from trade, efficiency and markets, non-competitive markets, game theory, government spending and taxation, economic growth, monetary and fiscal policy, unemployment and inflation, exchange rates. Includes applications for Journalism students. Not open to students who have completed ECONOM 1014 or ECONOM 1024 and, ECONOM 1015 or AG\_EC 1041 and AG\_EC 1042. Open only to pre-Journalism and Journalism Majors. Graded on A/F basis only. Prerequisite: departmental consent.

**ECONOM 1051H. General Economics - Honors. 5 Credits.**

One semester course covering similar material as covered in ECONOM 1014 and ECONOM 1015. Topics include opportunity costs, gains from trade, efficiency and markets, non-competitive markets, game theory, government spending and taxation, economic growth, monetary and fiscal policy, unemployment and inflation, exchange rates. Not open to

students who have completed ECONOM 1014 or ECONOM 1024 and, ECONOM 1015. Math Reasoning Proficiency Course. Prerequisites: Honors eligibility required.

**ECONOM 2004. Undergraduate Topics in Economics - Social Science. 1-3 Credit.**

Organized study of selected topics in Economics; applied or theoretical economics; covers subjects not included in regularly offered courses. Prerequisite: instructor's consent.

**ECONOM 3004. Topics in Economics - Social Science. 1-3 Credit.**

Study in applied or theoretical economics; covers subjects not included in regularly offered courses. Prerequisite: instructor's consent.

**ECONOM 3224. Introduction to International Economics. 3 Credits.**

A topical course which emphasizes the application of basic economic analysis to real and current international economic issues. Topics include free trade, protectionism, free trade areas, multilateral trade negotiations, trade and development, exchange rates, the International Monetary System, and economic integration. Prerequisite: Economics [ECONOM] 1014 or 1024 or 1051.

**ECONOM 3229. Money, Banking and Financial Markets. 3 Credits.**

Operation of the U.S. financial and economic system. Covers interest rates, banking regulation, the money supply process and the conduct of the Federal Reserve, inflation and the macroeconomy, exchange rates and the international financial system, rational expectations, and efficient markets. Prerequisites: Economics [ECONOM] 1014 or 1024 and 1015, or 1051.

**ECONOM 3229H. Money, Banking and Financial Markets - Honors. 3 Credits.**

Operation of the U.S. financial and economic system. Covers interest rates, banking regulation, the money supply process and the conduct of the Federal Reserve, inflation and the macroeconomy, exchange rates and the international financial system, rational expectations, and efficient markets. Prerequisites: Economics [ECONOM] 1014 or 1024 and 1015, or 1051. Honors eligibility required.

**ECONOM 3251. Theory of the Firm. 3 Credits.**

Theory of rational behavior in consumption, production, and pricing decisions of households and firms. Topics include the economics of the firm in the context of partial equilibria in product and factor markets under competition, monopoly, oligopoly and monopolistic competition as well as game theory. No credit for students who have completed Economics [ECONOM] 4351. Prerequisites: Economics [ECONOM] 1014 or 1024 or 1051, and Mathematics [MATH] 1400, or equivalent. Not open to economics majors.

**ECONOM 3323. Capitalism, Democracy and Society. 1 Credit.**

This is a one-credit seminar course for students interested in careers involving social science research and analysis; topics covered will be a selection of classic and contemporary debates in the social sciences. Prerequisites: Economics [ECONOM] 1014 and 1015, or 1051.

**ECONOM 4004. Topics in Economics- Social Science. 1-3 Credit.**

Study in applied or theoretical economics; covers subjects not included in regularly offered courses. Prerequisite: instructor's consent.

**ECONOM 4311. Labor Economics. 3 Credits.**

Surveys theoretical explanations of wage and employment determination in contemporary labor markets. Prerequisite: Economics [ECONOM] 3251 or 4351.



**ECONOM 4315. Public Economics. 3 Credits.**

Analyzes economic effects of government expenditures, taxes and debt. Expenditure and taxation principles, tax reform, cost-benefit analysis, fiscal policy. Prerequisite: Economics [ECONOM] 3251 or 4351.

**ECONOM 4320. History of Economic Thought. 3 Credits.**

Origins of modern economic thought in the context of social and intellectual environment of the time in which they originated, their contribution to their period and to modern thought. Prerequisites: Economics [ECONOM] 1014 or 1024 and 1015, or 1051.

**ECONOM 4322. Economics of Regulation and Antitrust. 3 Credits.**

Economic issues concerning the role of government regulation. The course examines the rationale for and effects of regulatory policies in public utilities, transportation, and communications industries. Prerequisite: Economics [ECONOM] 3251 or 4351.

**ECONOM 4325. The International Monetary System. 3 Credits.**

Study of macroeconomic and monetary relationships between the U.S. and the world. Topics include balance of payments, foreign exchange rates, history of the international monetary system. Prerequisite: Economics [ECONOM] 3229.

**ECONOM 4326. Economics of International Trade. 3 Credits.**

The microeconomic theory of international trade. Topics include comparative advantage, the theory of commercial policy, economic integration, trade with less developed countries and the trade effects of economic growth. Prerequisite: Economics [ECONOM] 3251 or 4351.

**ECONOM 4329. The Banking System and the Money Market. 3 Credits.**

Organization of the money market; credit control procedures and aims, effect of bank expansion and contraction on money market and national income deregulation. Prerequisite: Economics [ECONOM] 1015 or 1051.

**ECONOM 4340. Introduction to Game Theory. 3 Credits.**

An introduction to the theory of games, viewed as a set of tools used widely in economics to study situations in which decision-makers (consumers, firms, governments, etc.) interact. The course introduces the basic theory, emphasizing the concepts and their economic applications. Prerequisite: Economics [ECONOM] 3251 or 4351.

**ECONOM 4345. Economics of Education. 3 Credits.**

Economic theory is used to analyze the market for educational services and education policy. Topics include: human capital theory, cost and performance measures for public and private schools, market based approaches to school reform, school finance, higher education cost and access. Prerequisites: ECONOM 1014 or ECONOM 1024, or ECONOM 1051, and STAT 2500, or equivalent.

**ECONOM 4351. Intermediate Microeconomics. 3 Credits.**

Theory of rational behavior in consumption, production, and pricing decisions of households and firms. Partial equilibria in product and factor markets under competition, monopoly, oligopoly and monopolistic competition. A brief introduction to general equilibrium and welfare economics is provided. Calculus is employed. No credit for students who have completed Economics [ECONOM] 3251. Prerequisites: Economics [ECONOM] 1014 or 1024 or 1051, and Mathematics [MATH] 1400, or equivalent.

**ECONOM 4351H. Intermediate Microeconomics - Honors. 3 Credits.**

Theory of rational behavior in consumption, production, and pricing decisions of households and firms. Partial equilibria in product and factor markets under competition, monopoly, oligopoly and monopolistic competition. A brief introduction to general equilibrium and welfare

economics is provided. Calculus is employed. No credit for students who have completed ECONOM 3251. Prerequisites: Economics [ECONOM] 1014 or 1024 or 1051, and Mathematics [MATH] 1400, or equivalent. Honors eligibility required.

**ECONOM 4353. Intermediate Macroeconomics. 3 Credits.**

The study of the structure and performance of national economies. Topics include: long-term economic growth, aggregate economic fluctuations, unemployment, and inflation; consequences for national economies of being part of the global economic system; government policies and macroeconomic performance. Prerequisites: Economics [ECONOM] 1015 or 1051, and Mathematics [MATH] 1400, or equivalent.

**ECONOM 4355. Industrial Organization and Competitive Strategy. 3 Credits.**

Analyzes the structure of industry, its impact on the operations of the firm and significance for public policy. The focus is on strategic interaction among firms with market power. Topics include oligopoly, competition, collusion, price discrimination, product differentiation, advertising, entry and exit. Prerequisite: ECONOM 3251 or ECONOM 4351.

**ECONOM 4357. Health Economics. 3 Credits.**

Analyzes the economics of health care in the United States with particular attention paid to the role of government. It examines the demand for health care and the structure and consequences of public and private health insurance; the supply of health care, including professional training, licensure, specialization and compensation, hospital competition and finance, and the determinants and consequences of technical change in medicine and health care reform. Prerequisite: ECONOM 3251 or 4351 and STAT 2500, or equivalent.

**ECONOM 4360. Economic Development. 3 Credits.**

(same as PEA\_ST 4360). The study of less-developed countries including problems of measuring economic growth, analysis of sources of economic growth, causes of changes in economic and structure, development and trade policies. The consequences of goals and assumptions for development policy are analyzed. Prerequisites: ECONOM 3229, and ECONOM 3251 or ECONOM 4351.

**ECONOM 4361. Comparative Economic Systems. 3 Credits.**

Study of capitalism, market socialism, and central planning. Prerequisites: Economics [ECONOM] 3229, and 3251 or 4351.

**ECONOM 4367. Law and Economics. 3 Credits.**

This course is a survey of economic analyses of American legal institutions. Students will apply basic microeconomic, game theoretic and statistical concepts to the study of property, contracts, torts, the legal process, crime, and the judiciary. Prerequisites: ECONOM 3251 or ECONOM 4351, and STAT 2500, or equivalent.

**ECONOM 4370. Quantitative Economics. 3 Credits.**

The aim of this course is to provide an introduction to the mathematical language of economic theory. Topics include linear models, matrix algebra, rules of differentiation and comparative static analysis, optimization. Prerequisite: Mathematics [MATH] 1500 or equivalent.

**ECONOM 4371. Introductory Econometrics. 3 Credits.**

Study methods for quantitative analysis of economic data. Estimation techniques, tests of significance, prediction and forecasting reviewed with respect to problems presented by economic data and information demands of economic decision models. Prerequisites: ECONOM 3251 or ECONOM 4351, and STAT 2500, or equivalent.

**ECONOM 4384. Structural Change in Economic History. 3 Credits.**

Explores changes in the structure of the American economy from its earliest colonial beginnings. Structural change, an integral part of growth, is related to technical change, population growth and to the content and form of economic theory. Prerequisite: Economics [ECONOM] 1014 or 1024 and 1015, or 1051.

**ECONOM 4385. Problems in Economics. 1-3 Credit.**

Development of a carefully considered research project under close supervision of a faculty member. Credit arranged by instructor. Prerequisites: Economics [ECONOM] 4351, 4371, and instructor's consent. Not open to non-majors.

**ECONOM 4940. Internship in Economics. 3 Credits.**

Internship experience for Economics majors. 120 hours of supervised internship work with approval of Director of Undergraduate Studies and academic advisor. Graded on S/U basis only. Prerequisites: ECONOM 4351 and ECONOM 4371; Declared economics majors who have a minimum overall MU GPA of 2.75 and have junior or senior standing. Students must have completed at least 15 credit hours at MU.

**ECONOM 4965. Independent Study in Economics. 1-3 Credit.**

Individual work, with conferences adjusted to needs of student. Prerequisite: instructor's consent.

**ECONOM 4970. Senior Seminar in Economics. 3 Credits.**

Seminar for graduating seniors who are majoring in economics. Multiple writing assignments will emphasize synthesis of theoretical, empirical, and institutional economics. Not open to non-majors.

**ECONOM 4971. Supplemental Senior Seminar in Economics. 1 Credit.**

Content description is the same as Economics [ECONOM] 4970. Required for Economics honors students and double majors in Economics who take a capstone course in another major. No credit for students who have completed Economics [ECONOM] 4970. Not open to non-majors. Graded on A/F basis only.

**ECONOM 4995. Honors Proseminar. 3 Credits.**

Seminar for graduating seniors. This capstone course integrates previous economics courses by applying economic theories to problems. Students acquire an understanding of what research in economics can produce and how to produce those results. Course requirements are to produce a list of distinctive activities that count as research and produce a research paper. Multiple writing assignments will emphasize synthesis of theoretical, empirical and institutional economics. No credit for students who have completed Economics [ECONOM] 4970. Not open to non-majors. Capstone course required for Economics honors students.

**ECONOM 7001. Topics in Economics - General. 1-99 Credit.**

Study in applied or theoretical economics. Subjects and earnable credit may vary from semester to semester. Prerequisites: graduate standing; instructor's consent.

**ECONOM 7085. Problems in Economics. 1-99 Credit.**

Individual study in Economics. Prerequisite: Graduate standing and instructor's consent.

**ECONOM 7311. Labor Economics. 3 Credits.**

Surveys theoretical explanations of wage and employment determination in contemporary labor markets. Prerequisite: Economics [ECONOM] 3251 or 7351. Graduate standing required.

**ECONOM 7315. Public Economics. 3 Credits.**

Analyzes economic effects of government expenditures, taxes and debt. Expenditure and taxation principles, tax reform, cost-benefit

analysis, fiscal policy. Prerequisite: Economics [ECONOM] 3251 or 4351. Graduate standing required.

**ECONOM 7320. History of Economic Thought. 3 Credits.**

Origins of modern economic thought in the context of social and intellectual environment of the time in which they originated, their contribution to their period and to modern thought. Prerequisites: Economics [ECONOM] 1014 or 1024 and 1015 or 1051H. Graduate standing required.

**ECONOM 7322. Economics of Regulation and Antitrust. 3 Credits.**

Economic issues concerning the role of government regulation. The course examines the rationale for and effects of regulatory policies in public utilities, transportation, and communications industries. Prerequisite: Economics [ECONOM] 3251 or 7351. Graduate standing required.

**ECONOM 7325. The International Monetary System. 3 Credits.**

Study of macroeconomic and monetary relationships between the US and the world. Topics include balance of payments, foreign exchange rates, history of the international monetary system. Prerequisite: Economics [ECONOM] 3229. Graduate standing required.

**ECONOM 7326. Economics of International Trade. 3 Credits.**

The microeconomic theory of international trade. Topics include comparative advantage, the theory of commercial policy, economic integration, trade with LDC's and the trade effects of economic growth. Prerequisite: Economics [ECONOM] 7351 or instructor's consent. Graduate standing required.

**ECONOM 7329. The Banking System and the Money Market. 3 Credits.**

Organization of the money market; credit control procedures and aims, effect of bank expansion and contraction on money market and national income deregulation. Prerequisite: Economics [ECONOM] 1051 OR 1051.

**ECONOM 7332. Microeconomics for Managers. 3 Credits.**

Microeconomic concepts presented at the intermediate level, graphic treatment with limited calculus, managerial issues presented at the MBA level. Prerequisites: Economics [ECONOM] 1014 or 1024, Mathematics [MATH] 1300. Graduate standing required. (Not open to economics majors) must have a consent card for MBA program.

**ECONOM 7340. Introduction to Game Theory. 3 Credits.**

An introduction to the theory of games, viewed as a set of tools used widely in economics to study situations in which decision-makers (consumers, firms, governments, etc.) interact. The course introduces the basic theory, emphasizing the concepts and their economic applications. Prerequisite: Economics [ECONOM] 3251 or 7351 or instructor's consent. Graduate standing required.

**ECONOM 7345. Economics of Education. 3 Credits.**

Economic theory is used to analyze the market for educational services and education policy. Topics include: human capital theory, cost and performance measures for public and private schools, market based approaches to school reform, school finance, higher education cost and access. Prerequisites: ECONOM 1014 or ECONOM 1024, or ECONOM 1051H and ECONOM 4371 or equivalent.

**ECONOM 7351. Intermediate Microeconomics. 3 Credits.**

Theory of rational behavior in consumption, production, and pricing decisions of households and firms. Partial equilibria in product and factor markets under competition, monopoly, oligopoly and monopolistic competition. A brief introduction to general equilibrium and welfare

economics is provided. Calculus is employed. No credit for students who have completed 3251. Prerequisites: Economics [ECONOM] 1014 or 1024 or 1051H and Mathematics [MATH] 1320 or equivalent. Graduate standing required.

**ECONOM 7353. Intermediate Macroeconomics. 3 Credits.**

The study of the structure and performance of national economics. Topics include: long-term economic growth, aggregate economic fluctuations, unemployment, and inflation; consequences for national economies of being part of the global economic system; government policies and macroeconomic performance. Prerequisites: Economics [ECONOM] 1015 or 1051 and Mathematics [MATH] 1400 or equivalent.

**ECONOM 7355. Industrial Organization and Competitive Strategy. 3 Credits.**

Analyzes the structure of industry, its impact on the operations of the firm and significance for public policy. The focus is on strategic interaction among firms with market power. Topics include oligopoly, competition, collusion, price discrimination, product differentiation, advertising, entry and exit. Prerequisites: Economics [ECONOM] 3251 or Economics [ECONOM] 7351. Graduate standing required.

**ECONOM 7357. Health Economics. 3 Credits.**

(same as Public Affairs [PUB\_AF] 7357). Analyzes the economics of health care in the United States with particular attention paid to the role of government. It examines the demand for health care and the structure and consequences of public and private health insurance; the supply of health care, including professional training, licensure, specialization and compensation, hospital competition and finance, and the determinants and consequences of technical change in medicine; and examination of recent proposals and initiatives for health care reform. Prerequisite: Statistics [STAT] 2500 and Economics [ECONOM] 4351.

**ECONOM 7360. Economic Development. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4360). The study of less-developed countries including problems of measuring economic growth, analysis of sources of economic growth, causes of changes in economic and structure, development and trade policies. The consequences of goals and assumptions for development policy are analyzed. Prerequisite: Economics [ECONOM] 3229 and 3251 or 4351; graduate standing required.

**ECONOM 7361. Comparative Economic Systems. 3 Credits.**

Study of capitalism, market socialism, and central planning. Prerequisites: Economics [ECONOM] 3229 and 3251 or 4351. Graduate standing.

**ECONOM 7367. Law and Economics. 3 Credits.**

(same as Public Affairs [PUB\_AF] 7367). This course is a survey of economic analyses of American legal institutions. Students will apply basic microeconomic, game theoretic and statistical concepts to the study of property, contracts, torts, the legal process, crime and the judiciary. Prerequisites: Economics [ECONOM] 4351 or 3251, and Statistics [STAT] 2500, or equivalent.

**ECONOM 7370. Quantitative Economics. 3 Credits.**

The aim of this course is to provide an introduction to the mathematical language of economic theory. Topics include linear models, matrix algebra, rules of differentiation and comparative static analysis, optimization. Prerequisite: Mathematics [MATH] 1500 or equivalent. Graduate standing required.

**ECONOM 7371. Introductory Econometrics. 3 Credits.**

Study methods for quantitative analysis of economic data. Estimating techniques, tests of significance, prediction and forecasting reviewed

with respect to problems presented by economic data and information demands of economic decision models. Prerequisites: Economics [ECONOM] 3251 or 4351 and Statistics [STAT] 1320 and Mathematics [MATH] 1320 or instructor's consent. Graduate standing required.

**ECONOM 7384. Structural Change in Economic History. 3 Credits.**

Explores changes in the structure of the American economy from its earliest colonial beginnings. Structural change, an integral part of growth, is related to technical change, population growth and to the content and form of economic theory. Prerequisite: Economics [ECONOM] 1014 or 1024 and 1015, or 1051H or instructor's consent. Graduate standing required.

**ECONOM 8001. Topics in Economics- General. 3 Credits.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: instructor's consent.

**ECONOM 8085. Problems in Economics. 1-99 Credit.**

Graduate students may select topics for study and investigation subject to approval by supervising faculty.

**ECONOM 8090. Research in Economics. 1-99 Credit.**

Thesis research for M.A. degree. Graded on a S/U basis only.

**ECONOM 8340. Game Theory. 3 Credits.**

Game theory is the study of strategic behavior by agents who perceive themselves as "large" relative to the market and who therefore consider the effect of their behavior on others. This course examines the rigorous theory of strategic interaction of rational agents. Prerequisites: Economics [ECONOM] 4351 or equivalent; Mathematics [MATH] 1320 or equivalent; graduate standing. May be repeated for credit. Graded on A-F basis only.

**ECONOM 8370. Mathematics for Economics. 3 Credits.**

The aim of this course is to cover essential mathematics used in economics. Topics include introductory linear algebra, multivariate calculus, comparative statics analysis, unconstrained optimization, and equality constrained optimization. Prerequisites: Economics [ECONOM] 4351 or equivalent; Mathematics [MATH] 1320 or equivalent; graduate standing. May be repeated for credit. Graded on A-F basis only.

**ECONOM 8413. Research Workshop I. 3 Credits.**

Required course for economics MA students. Combines instruction, student presentations, and seminar participation to introduce research methods and practice. A major research paper are required. Prerequisite: Economics [ECONOM] 8451, 8453, and 8472 or instructor's consent.

**ECONOM 8451. Microeconomic Theory. 3 Credits.**

MA-level course in microeconomic theory. The course relies extensively on calculus to survey theories of: rational behavior in consumption, production, and pricing decisions of households and firms; partial equilibria in product and factor markets under competition, monopoly, oligopoly and monopolistic competition; and general equilibrium and welfare. Prerequisites: Graduate standing or instructors consent.

**ECONOM 8453. Macroeconomic Theory. 3 Credits.**

Basic models in macroeconomics will be covered with emphasis on assumptions and on how hypotheses can be tested. Course is an introductory survey for students intending to develop ability for research in macroeconomics. Prerequisites: Economics [ECONOM] 4353 or equivalent; at least concurrent enrollment in 8451. Graduate standing required or instructor's consent.

**ECONOM 8470. Dynamic Optimization. 3 Credits.**

Topics to be covered include calculus of variations, optimal control theory, dynamic programming in discrete time variables, and economic modeling. The Eulless Equation, the Transversally Condition and

the Bellman Equation will also be covered. Prerequisite: Economics [ECONOM] 7370.

**ECONOM 8472. Econometric Methods I. 3 Credits.**

Familiarizes students with fundamental techniques found and used in applied economic research. Topics include: ordinary least squares, generalized least square, instrumental variables, maximum likelihood estimation, and generalized methods of moments. Prerequisite: Statistics [STAT] 7710 or instructor's consent.

**ECONOM 8473. Applied Econometrics. 3 Credits.**

Continuation of Economics [ECONOM] 8472 for MA students. Topics include: simultaneous equations, nonlinear least squares, qualitative choice. Prerequisites: Economics [ECONOM] 8472 or instructor's consent; graduate standing. Graded on A/F basis only.

**ECONOM 9001. Topics in Economics. 3 Credits.**

Selected current topics in economics. Prerequisite: graduate standing.

**ECONOM 9085. Problems in Economics. 1-99 Credit.**

Graduate students may select topics for study and investigation subject to approval by supervising faculty.

**ECONOM 9090. Research in Economics. 1-99 Credit.**

Thesis research for Ph.D. degree. Graded on a S/U basis only.

**ECONOM 9411. Advanced Labor Economics I. 3 Credits.**

Analysis of the determination of wages and employment and the relation of trade unionism to the economy. Prerequisites: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9412. Advanced Labor Economics II. 3 Credits.**

Applications of contemporary analytical techniques to labor market topics chosen by the instructor. Prerequisites: Economics [ECONOM] 9411 and 9452 or instructor's consent.

**ECONOM 9413. Research Workshop II. 1-2 Credit.**

Introduces doctoral students to practices of preparing scholarly economic research by moving through the process of selecting a topic, identifying relevant literature, and communicating results. Prerequisites: Economics [ECONOM] 9452, 9454 and 9474; PhD standing. Graded on A/F only.

**ECONOM 9415. Advanced Public Economics I. 3 Credits.**

Tax incidence and optimal taxation in static economies and issues of taxation in dynamic economies. Prerequisites: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9416. Advanced Public Economics II. 3 Credits.**

Macroeconomic issues of government finance. Theoretical and empirical analysis of Ricardian equivalence. Prerequisite: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9426. International Trade. 3 Credits.**

Pure theory of international trade and commercial policy. Prerequisite: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9427. Topics in International Trade. 3 Credits.**

The course will cover recent research in International Trade and important issues related to the impact of trade on economic growth and development. Topics include the relationship between trade and growth, the impact of international trade on firms, households and economic growth. Prerequisites: Economics [ECONOM] 9452 or instructor's consent; graduate standing. Graded on A/F basis only.

**ECONOM 9430. Advanced Money and Banking. 3 Credits.**

The working and structure of institutional arrangements, welfare aspects of structural policies, operation of money and credit markets, and

behavior of returns on assets. Prerequisites: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9431. Central Banking Policies. 3 Credits.**

Examines central banking procedures, policies and the role they play in maintaining economic stability. Special attention to connection of Federal Reserve System with money and capital markets. Prerequisites: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9446. Advanced Empirical Methods. 3 Credits.**

Empirical and modeling techniques for evaluation of microeconomic policy questions. Prerequisites: Economics [ECONOM] 8451, 8472, concurrent enrollment in 8473 or 9473 strongly recommended; graduate standing.

**ECONOM 9447. Topics in Microeconomic Policy Analysis. 3 Credits.**

Applies the methods and techniques of microeconomics and to specific timely policy questions. Taught by applied-microeconomics faculty and focuses on current topics in labor economics, public economics, the economics of education, health economics, and other applied areas of microeconomics. Prerequisites: Economics [ECONOM] 8451, 8472, 9446; concurrent enrollment in Economics [ECONOM] 8473 or 9473 strongly recommended; graduate standing.

**ECONOM 9451. Advanced Microeconomic Theory I. 3 Credits.**

The theory of rational behavior and partial equilibrium in markets. Topics include consumer behavior, theory of the firm, decisions making under uncertainty, perfect competition, monopoly and monopsony, and imperfect competition. Prerequisites: Economics [ECONOM] 9451 or instructor's consent; PhD standing. Graded on A/F basis only.

**ECONOM 9452. Advanced Microeconomic Theory II. 3 Credits.**

Survey of equilibrium theory and market failures in economics. Topics include the structure and modeling of games, and cooperative and non-cooperative equilibrium concepts. Prerequisite: Economics [ECONOM] 9451 or instructor's consent.

**ECONOM 9453. Advanced Macroeconomic Theory I. 3 Credits.**

Aggregate models of life-cycle microfoundations, of macroeconomics fluctuations and growth. Prerequisite: departmental consent; PhD standing. Graded on A/F basis only.

**ECONOM 9454. Advanced Macroeconomic Theory II. 3 Credits.**

Analyzes topics in income analysis, including capital theory and economic dynamics. Prerequisite: Economics [ECONOM] 9453 or instructor's consent.

**ECONOM 9455. Monopoly and Competition. 3 Credits.**

A survey of the theoretical and empirical literature on the organization of industries. Includes study of monopolized markets, competitive markets, and strategic interaction among firms in imperfectly competitive markets. Both the rationale and practice of anti-trust policy are studied. Prerequisites: Economics [ECONOM] 9452 and 9471 or instructor's consent. Graduate Standing Required.

**ECONOM 9460. Development Economics. 3 Credits.**

Theories of economic development critically examined. Sources and consequences of growth processes analyzed in context of economic theory and historical occurrence. Prerequisites: Economics [ECONOM] 8451 and 8472.

**ECONOM 9471. Advanced Game Theory. 3 Credits.**

Presents core concepts in game theory and illustrates their uses with a range of applications. Prerequisite: Economics [ECONOM] 9452 or instructor's consent.

**ECONOM 9473. Econometric Methods II. 3 Credits.**

Introduces students to econometric concepts and techniques at a theoretical level, and provides a bridge to understanding the econometric literature. Topics include: probability theory, convergence, simultaneous equations, nonlinear models, and nonparametric estimation. Prerequisite: Departmental consent.

**ECONOM 9474. Econometric Methods III. 3 Credits.**

This course is designed to familiarize students with useful econometric tools not covered in Econometric Methods I and II. Prerequisite: Economics [ECONOM] 9473 or instructor's consent; PhD standing. Graded on A/F basis only.

**ECONOM 9476. Advanced Topics in Econometrics I. 3 Credits.**

Equips students with some essential tools for conducting publishable econometric research. Topics at the discretion of the instructor. Prerequisite: Economics [ECONOM] 9474 or instructor's consent.

**ECONOM 9477. Advanced Topics in Econometrics II. 3 Credits.**

Equips students with some essential tools for conducting publishable econometric research topics at the discretion of the instructor. Prerequisite: Economics [ECONOM] 9476 or instructor's consent.

**ECONOM 9480. Independent Readings for Ph.D. Comprehensive Examinations. 1-6 Credit.**

Independent Readings for Ph.D. Comprehensive Exam. Graded on S/U basis only.

**ECONOM 9484. Economic History. 3 Credits.**

Techniques of the new economic history are explored in the context of European economic development. Prerequisites: Economics [ECONOM] 8451.

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## Education Honors (EDUC\_H)

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**EDUC\_H 3050H. Special Readings in Education Honors. 1-4 Credit.**

Directed study of literature and research reports in education. Prerequisites: instructor's consent and Honors program director.

**EDUC\_H 3060H. Honors Seminar in Education Honors. 1-2 Credit.**

Prerequisites: instructor's consent and Honors program director.

**EDUC\_H 3070H. Special Practicum in Education Honors. 1-4 Credit.**

Directed practicum experience with students in educational settings. Prerequisites: instructor's consent and Honors program director.

**EDUC\_H 3080H. Honors Research in Education Honors. 1-4 Credit.**

Joint research in education with a member of the education faculty. Prerequisites: instructor's consent and Honors program director.

**EDUC\_H 4996H. Undergraduate Reading Honors. 3 Credits.**

This course is designed to introduce students to a variety of readings from a broad array of research, historical, contemporary and philosophical documents and writings. Selection of topics and additional readings are determined by the faculty instructor for the course. Graded on A/F basis only. Prerequisites: instructor's consent; GPA of 3.5 or higher.

**EDUC\_H 4997H. Honors Undergraduate Seminar I. 1 Credit.**

This class will consist of a 1 credit hour seminar. The class is designed to allow undergraduates to develop the skills necessary to engage in practical research for application within the field of teaching and education. The culminating assignment for the class is a proposal for a research poster or presentation to be presented at the undergraduate

research fair held each year in May. Graded on A/F basis only.

Prerequisites: instructor's consent; GPA of 3.5 or higher.

**EDUC\_H 4998H. Honors Undergraduate Seminar II. 1 Credit.**

The class will consist of a 1 credit hour seminar. The class is designed to allow undergraduates to develop the skills necessary to engage in practical research for application within the field of teaching and education. The culminating assignment for the class is the production of a research poster or presentation at the undergraduate research fair held each year in May. Graded on A/F basis only. Prerequisites: instructor's consent; GPA of 3.5 or higher.

**EDUC\_H 4999H. Honors Undergraduate Research Seminar. 1-2 Credit.**

This class will be offered over 2 academic semesters and will consist of a 1-2 credit hour lab each semester with a College of Education faculty member working on an undergraduate research project. This course is designed as part of the Honors sequence and is designed to be taken concurrently with Teacher Development Program [TDP] 4997H and 4998H. Graded on A/F only. Prerequisite: instructor's consent; GPA of 3.5 or higher.

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## Educational Leadership and Policy Analysis (ED\_LPA)

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**ED\_LPA 3100. Foundations of Education. 1-3 Credit.**

Focus on developing a theoretical and conceptual knowledge of leadership. In addition, skill building-exercises will take place through group case studies and role playing exercises allowing each student to identify and achieve methods for personal development.

**ED\_LPA 4060. Inquiring into Schools, Community and Society II. 3 Credits.**

Required 3 hour course for students pursuing teacher certification. Designed to transition students into the teaching internship through study of teacher roles, school organizations and cultures, and community contexts. Prerequisites: Learning, Teaching and Curriculum [LTC] 2040/7040.

**ED\_LPA 7060. Inquiring into Schools, Community and Society II. 3 Credits.**

Required 3 hours course for students pursuing teacher certification. Designed to transition students into the teaching internship through study of teacher roles, school organizations and cultures, and community contexts. Prerequisites: Teacher Development Program [TDP] 2040; 7040.

**ED\_LPA 7085. Problems in Educational Leadership and Policy Analysis. 1-99 Credit.**

Problems in Educational Leadership and Policy Analysis.

**ED\_LPA 7301. Topics in Educational Leadership and Policy Analysis. 1-99 Credit.**

Group study of topics in educational leadership, policy analysis, and higher and continuing education.

**ED\_LPA 7458. Sociology of Education. 3 Credits.**

(same as Sociology [SOCIO] 4410/7410). Contexts, structures and processes of schooling; effects on class, race, ethnicity and gender; social change, educational policy, and organizational dynamics; higher education and the economy. Prerequisite: Sociology [SOCIO] 1000 or equivalent.

**ED\_LPA 7822. College Teaching with Technology I. 1 Credit.**

(same as Information Science and Learning Technologies [IS\_LT] 7822). Examines the use of educational technologies, both class room based (e.g., student response systems) and online (e.g., course management's systems), to assist in the dissemination of course resources and the facilitation of student interaction.

**ED\_LPA 7823. College Teaching with Technology II. 1 Credit.**

(same as Information Science and Learning Technologies [IS\_LT] 7823). Integrates learning technologies into the traditional framework of a face-to-face course by creating a course website and developing technical proficiency with relevant educational technologies. Prerequisite: College Teaching I or instructor's consultation.

**ED\_LPA 8409. Learning, Curriculum and Assessment for School Leaders. 3 Credits.**

Addresses assessment, learning and curriculum and the integration of the instructional and assessment processes. Topics include authentic assessment, curriculum alignment, cognition and learning, instructional approaches, and application of student learning theory to the curriculum.

**ED\_LPA 8410. Learning Cultures. 3 Credits.**

Integrates the themes of building a common purpose to enhance school culture, empowering teachers and students, and diversity. Topics include importance of shared mission and vision, the use of group processes and collaboration, the intricacies of school culture, and ethical and moral leadership.

**ED\_LPA 8411. Professional Development for Learning. 3 Credits.**

Focuses on the professional development and reflection on practice. Topics include organizational actions and personal responsibility, life-long learning, and public education in a democratic society.

**ED\_LPA 8412. School Improvement. 3 Credits.**

This course addresses the topics of organizational management and personal inquiry. It covers issues such as organizational effectiveness, organizing for an effective school environment, legal and fiscal decision-making and responsibilities of school leaders, creating an environment where stakeholders acquire and utilized data to inform decisions and practice, and where action research methods are utilized to evaluate and inform practice.

**ED\_LPA 8413. Internship. 1-11 Credit.**

The internship experience provides the opportunity for the student to assume a leadership role associated with instructional improvement. Graded on S/U basis only.

**ED\_LPA 8414. Current Issues in Site-Level Leadership. 3 Credits.**

This course is designed to introduce students to the rigors of the principalship. Topics will include issues affecting beginning principals, school cultures, and the use of technology for communication and research.

**ED\_LPA 8415. Leadership for Collaborative Cultures. 3 Credits.**

This course will instill an understanding of major components of purposeful, systemic change, interpersonal relationships, communication and organizational management. The development of an appreciation of diversity, equity, and democracy for all students will be an ongoing theme of the course.

**ED\_LPA 8416. Foundations of School Leadership. 3 Credits.**

School leader knowledge of student learning theory and related instructional practices is the focus of this course. The problem-based learning format will include topics on school culture, leadership

communication, technology, and conflict resolution. Issues concerning professional relationships are also addressed.

**ED\_LPA 8417. Site-Level Organization and Leadership. 3 Credits.**

Student will study state and national regulations that affect Missouri school policies. The student will develop a database on various legal issues. A study of middle level education will conclude with on-site evaluation of a local middle school.

**ED\_LPA 8418. Supervision for Learning Environments. 3 Credits.**

Students are prepared to articulate, recognize, and support classroom practices that reflect the most current principles of learning. Effective instructional strategies that link this knowledge to practice will be entered into a computer database.

**ED\_LPA 8419. Structures and Processes for Effective Schools. 3 Credits.**

Emphasis is placed on the Missouri Comprehensive Guidance Program and positive strategies for working with challenging students. A continuation of the study of state and national legal and policy issues will focus on special programs and services.

**ED\_LPA 8420. Curriculum for Site-Level Leadership. 3 Credits.**

Student and program assessment are the primary topics for this course on curricular leadership. Class participants are engaged in the development of authentic experiences using technology to develop and apply the testing and assessment knowledge appropriate to school leaders.

**ED\_LPA 8421. Action Research in School Leadership. 3 Credits.**

Databases on legal and policy issues are completed and merged into a single database and placed on the specialist program web site. Site and classroom level action research is investigated, concluding with an assessment of local action research efforts in area schools.

**ED\_LPA 8422. Advanced Problems of Leadership Practice. 3 Credits.**

This pre-internship course is a study of team building, program assessment, and site-based management. Addressing problems through a comprehensive school improvement approach with practicing principal will serve to prepare the students for internship experiences.

**ED\_LPA 8423. Advanced Leadership for Learning Environments. 3 Credits.**

Students will demonstrate their understanding of instructional improvement for all teachers and students by designing and defending a comprehensive strategy for instructional changes in a simulated school. The ongoing study of learning principles and effective instructional practices will be concluded.

**ED\_LPA 8424. Education Politics and Policymaking. 3 Credits.**

This course examines the politics and policymaking process of education in the United States, paying particular attention to the influence of various institutions and actors at local, state, and federal levels. Graded on A-F basis only.

**ED\_LPA 8428. Curriculum Leadership. 3 Credits.**

A study of research, theory, and skills necessary for curriculum leadership in educational organizations. Course includes generic curriculum management processes, design trends, controversial issues multi-media, innovative instructional techniques, and program evaluation. Prerequisite: graduate standing.

**ED\_LPA 8430. School Law and Finance for Principal Leadership. 3 Credits.**

Designed to engage learners in examination of the legal (judicial and legislative) system, school law, and finance policies that govern public schools and their fiscal resources in the United States and the State of Missouri. Graded on A/F basis only.

**ED\_LPA 9090. Research in Educational Leadership and Policy Analysis. 1-99 Credit.**

Graded on a S/U basis only. Prerequisite: departmental consent.

**ED\_LPA 9095. Problems in Educational Leadership and Policy Analysis. 1-99 Credit.**

Prerequisite: instructor's consent.

**ED\_LPA 9400. Social Theory in Education. 3 Credits.**

Students will examine the relationship of society and education through a variety of theoretical perspectives and empirical studies. These theories deal with the relation of education to society as a whole, and the relation between education and the state. Graded on A-F basis only.

**ED\_LPA 9401. Educational Leadership. 3 Credits.**

Critical examination of key leadership theories and their application to various educational contexts. Includes consideration of research methods and designs appropriate for the study of leadership and the spectrum of lenses through which educational leadership is studied.

**ED\_LPA 9402. Educational Policy Analysis. 3 Credits.**

Course centers on developing multiple understandings of the education policy making process. Theoretical constructs used to advance those understandings are eclectic in nature, drawing from the fields of political science, history, sociology and economics.

**ED\_LPA 9403. Organizational Analysis. 3 Credits.**

Analysis of organizational characteristics and principles in educational organizations. Topics include: Organizational theories and models, organizational culture, communication, innovation, planning, leadership, power and influence, and external environment influences.

**ED\_LPA 9404. Inquiry into Educational Leadership and Policy Analysis. 3 Credits.**

A critical overview of theory development, research paradigms, and research ethics in the department of Educational Leadership and Policy Analysis. Required for all ELPA Ph.D. students. Recommended for students who have completed at least 2 semesters of coursework.

**ED\_LPA 9405. Seminar in Educational Leadership and Policy Analysis. 1-99 Credit.**

Seminar in Educational Leadership and Policy Analysis.

**ED\_LPA 9406. Seminar in Educational Administration. 1-99 Credit.**

Seminar in Educational Administration.

**ED\_LPA 9407. Seminar in Educational Policy. 1-99 Credit.**

Seminar in Educational Policy.

**ED\_LPA 9408. Seminar in Higher Education. 1-99 Credit.**

Seminar in Higher Education.

**ED\_LPA 9424. Superintendent: Instructional Leadership. 3 Credits.**

Effective superintendents understand educational core knowledge of curriculum, instructional and assessment. They establish an exception for the use of best instructional practices for all students among both the educational and public communities. Graded on A/F basis only.

**ED\_LPA 9427. School Budget Development and Fiscal Management. 3 Credits.**

This course includes an overview of school finance programs of the 50 states, including special funds for exceptional children and compensatory education. Various aspects of planning, accounting, auditing, and reporting related to budget development and fiscal management are covered.

**ED\_LPA 9429. Superintendent: Communication, Team Leadership. 3 Credits.**

Effective superintendents negotiate political and cultural challenges to lead diverse, socially-just school systems. Reflective practices that enhance competence in public board member, and district personnel relationships are essential skills. Graded on A/F basis only.

**ED\_LPA 9430. Superintendent: Fiscal, Legal Leadership. 3 Credits.**

Effective superintendents efficiently manage finances and ensure that rules, regulations, and policies adhere to statutory/case law. Fiscal and legal practices ensure equity of educational experiences for all students. Open to all graduate students. Graded on A/F basis only.

**ED\_LPA 9437. Topics in Educational Leadership and Policy Analysis. 1-99 Credit.**

Topics in Educational Leadership and Policy Analysis.

**ED\_LPA 9439. Applying Higher Education Research to Practice. 3 Credits.**

This course introduces quantitative, qualitative, and mixed within a student affairs context. Students will become familiar with, and able to critique research. Course graded on A/F basis only. Graduate Standing Only.

**ED\_LPA 9440. Race, Gender, and Ethnicity in Higher Education. 3 Credits.**

(same as Women and Gender Studies [WGST] 9440). Historical and current issues of race, gender, and ethnicity in colleges and universities in the U.S. Issues include: students, faculty, and staff experiences of diversity, access and equity, and salience of diversity in a higher education setting.

**ED\_LPA 9441. The Adult Learner. 3 Credits.**

The identification of learning, motivation and participation patterns among adults will be examined. Learning theories and adult development life-cycle and stage research data will be explored as well as their implications for practice.

**ED\_LPA 9442. Curriculum Philosophy and Development in Higher Education. 3 Credits.**

A study of the philosophical foundations of postsecondary curricula, current trends and issues, and approaches to curriculum reforms and revisions.

**ED\_LPA 9444. Program Planning in Higher Education. 3 Credits.**

Analysis of program planning and evaluation in higher education. Topics include: conceptualizations of program planning, situational analysis, needs assessment, priority setting, marketing and promotion, and program evaluation.

**ED\_LPA 9445. College Student Development. 3 Credits.**

(same as Educational, School and Counseling Psychology [ESC\_PS] 9445). Emphasis on college student development theory and its application in student affairs work.

**ED\_LPA 9446. Student Affairs Administration. 3 Credits.**

(same as Educational School and Counseling Psychology [ESC\_PS] 9446). History, philosophy, theory, and issues pertinent to student affairs work.

**ED\_LPA 9447. College Student Culture and Environment. 3 Credits.**

This course examines the characteristics and outcomes of American undergraduates, and the aspects of the college environment the differentially influence students. Topics include: theoretical models of students change, campus climate and cultures, learning communities, institutional differences, and conditions for success.

**ED\_LPA 9448. College Teaching. 3 Credits.**

Designed to introduce students to theories and practices central to teaching in a higher education setting. Teaching related to institutional contexts and disciplines will be considered. Teaching and learning theories will be introduced.

**ED\_LPA 9449. History of Higher Education in the United States. 3 Credits.**

A study of the transformation of the English college tradition to what higher education is currently in the United States. The emphasis is on how institutions of higher learning changed to meet the needs of the nation or failed to do so.

**ED\_LPA 9450. Administration and Governance of Higher Education. 3 Credits.**

Principles of administration, academic culture and environment, and structures of governance of higher education will be explored.

**ED\_LPA 9451. Higher Education Finance. 3 Credits.**

How students pay for college and how institutions finance their operations is explored through the lens of economics. Topics include: Theories of student access, tuition and financial aid policy, institutional costs and revenue patterns, and resource allocation models.

**ED\_LPA 9452. Overview of Higher Education. 3 Credits.**

This course provides an overview of American Higher education. Emphasis is placed on how these institutions currently operate and what issues dominate current discussions of academe.

**ED\_LPA 9453. Continuing Education for the Professions. 3 Credits.**

Comparative study of education for the professions. Examination of professions as occupations, approaches and goals of preparatory and continuing education, professionals as adult learners and influence of intra-profession issues and societal exchange on education.

**ED\_LPA 9454. Introduction to Post-Secondary Law. 3 Credits.**

Examination of the legal structure within which higher education operates. Includes consideration of legal analysis of case law, institutional responsibilities under the law, and analysis of legal issues within postsecondary education.

**ED\_LPA 9455. The Community College. 3 Credits.**

An overview of the community college. Topics include historical roots and development of the community college, organization and governance, finance, students, faculty, administrators, curriculum, social role, and recurring and emerging issues.

**ED\_LPA 9456. The Professoriate. 3 Credits.**

Overview of faculty roles and work in U.S. colleges and universities. Explores institutional and disciplinary differences and seeks to prepare future faculty for academic life.

**ED\_LPA 9457. Higher Education Policy. 3 Credits.**

An overview of current higher education policy issues facing governmental bodies and institutions. An emphasis is placed on investigating both the policy-making and policy-evaluation processes through multiple theoretical lenses. Specific topics explored include access, equity, and accountability within the higher education setting. Graduate Standing Required.

**ED\_LPA 9459. Comparative and International Education. 3 Credits.**

Theories, methods and issues in the field of comparative and international education. Topics cover PK-16 education and include globalization, centralization and decentralization, equity and equity, teaching and student learning, and social context of education.

**ED\_LPA 9460. Philosophic Theory in Education. 3 Credits.**

Examines major ideological movements in modern education; their social antecedents and philosophic underpinnings.

**ED\_LPA 9461. Ethics in Education. 3 Credits.**

Explores the ethical dimensions of work within and related to educational settings focusing on dilemmas that occur in professional practice, theories that inform thinking about ethical issues, and frameworks that guide ethical decision making.

**ED\_LPA 9462. History of U.S. Education Policy. 3 Credits.**

Provides overview of major US education issues (primary K-12), explores analytic tools for studying history of education and introduces multiple ways of constructing the history of a particular movement reform or era in education.

**ED\_LPA 9463. Politics of Education. 3 Credits.**

Focuses on politics of education in the United States, attending to the influence of various institutions and actors at local, state, and federal levels. Students will examine current reforms in PK-12 education and their impact on the future of education.

**ED\_LPA 9464. Theory and Practice in Multicultural Education. 3 Credits.**

Designed to give educational professionals a better understanding of the theoretical foundations of multicultural education as well as current practices in this field.

**ED\_LPA 9465. Policy Analysis Using Large Data Bases. 3 Credits.**

Intends to develop students' capacity to process national level large databases and to conduct policy-related research. The prerequisite is an understanding of inferential statistics and experience with SPSS and SAS program.

**ED\_LPA 9469. Education Leadership Inquiry IV. 1 Credit.**

Developing and writing research proposals and conducting pilot studies. Knowledge and skills in writing the research report and sharing research with others. Open only to students in Ed.D. Program in Educational Leadership. Prerequisites: Educational Leadership and Policy Analysis [ED\_LPA] 9471, 9472 and 9473. Graduate Standing Required.

**ED\_LPA 9470. Organizational Analysis for Educational Leadership. 4 Credits.**

Schools of organizational theory, six frames to analyze organizations and their underlying concepts, organizational change and leadership for change, and rationale for reframing organizations. Open only to students in Ed.D. program in Educational Leadership.

**ED\_LPA 9471. Educational Leadership Inquiry I. 2 Credits.**

Introductory seminar on evaluating research using, APA Publication guidelines, writing scholarly publications, and using computer technology



for literature searches. Open only to students in Ed.D. Program in Educational Leadership.

**ED\_LPA 9472. Educational Leadership Inquiry II. 1 Credit.**

MU Graduate School policies related to doctoral research, use of multiple search sources, human subjects review process, and research ethics. Open only to students in Ed.D. program in Educational Leadership.

**ED\_LPA 9473. Educational Leadership Inquiry III. 1 Credit.**

Knowledge and skills in applying planning procedures for development and implementation of future dissertation research. Open only to students in Ed.D. Program in Educational Leadership.

**ED\_LPA 9474. Professional Seminar I. 1 Credit.**

Focuses on diversity and ethics in educational leadership and educational organizations. Students learn about professional development, professional practice, and professional service. Open only to students in Ed.D. Program in Educational Leadership. Repeat for credit.

**ED\_LPA 9475. Professional Seminar II. 1 Credit.**

Problem-based learning via the Internet to make decisions involving professional practice and problem solving. The UCEA Internet program, Information Environment for School Leader Preparation, is used. Open only to students in Ed.D. Program in Educational Leadership. Repeat for credit.

**ED\_LPA 9476. Leadership Theory and Practice. 3 Credits.**

An advanced study of leadership theories, concepts, and inquiry as applied to educational organizations. Explores power and authority in organizations, leader effectiveness, and organizational reform. Open only to students in Ed.D. Program in Educational Leadership.

**ED\_LPA 9477. Leadership Theory and Practice Application. 1 Credit.**

Focuses on building understanding of the conduct of leadership in organizations through application and extension of leadership theories in practice. Open only to students in Ed.D. Program in Educational Leadership.

**ED\_LPA 9478. Policy Analysis for Educational Leadership. 4 Credits.**

Analysis and investigation of educational policy utilizing various knowledge bases; organizational politics and culture's impact on policy processes; interpretation and application of policy-making activities. Open only to students in Ed.D. Program in Ed. Leadership.

**ED\_LPA 9479. Content and Context of Learning. 3 Credits.**

Students develop the knowledge and skills for examining designing, and implementing organizational, classroom, and training conditions that support quality learning experiences for learners. Open only to students in Ed.D. Program in Educational Leadership.

**ED\_LPA 9480. Team Building and Group Dynamics. 1 Credit.**

Stages of group development, team building and maintenance, team/group structures, team performance, problem-based learning as team process, and empowerment through development of self-managed teams. Open only to students in Ed.D. Program in Educational Leadership.

**ED\_LPA 9481. Internship in Educational Leadership and Policy Analysis. 1-99 Credit.**

Prerequisite: departmental consent. Some sections may be graded on A/F or S/U basis only.

**ED\_LPA 9482. Quantitative Tools for Applied Research in Educational Leadership. 3 Credits.**

General introduction to quantitative methods of data analysis. Develop concepts of measurement, design, and analysis. The focus is on data driven decision making and using various quantitative methods to investigate problems of educational leadership practice. Prerequisite: Only students in the Statewide Cooperative Ed.D. program in Educational Leadership can enroll. Graded on A/F basis only.

**ED\_LPA 9483. Qualitative Tools for Applied Research in Educational Leadership. 3 Credits.**

Students will learn about a number of qualitative research designs that leaders can use to critically examine research questions in their practice. They will also learn to analyze educational issues and execute processes to effectively explore those issues. Restricted to students in the Statewide Cooperative Ed.D. Program in Educational Leadership. Graded on A/F basis only.

**ED\_LPA 9484. Program Evaluation and Planning for Educational Leaders. 3 Credits.**

Participants develop thorough knowledge of theoretical underpinnings of selected approaches to program planning and evaluation and their necessary integration. Affords participants the opportunity to plan, conduct and deliver the results of a program evaluation to actual client. Only students in the Statewide Cooperative Ed.D. Program in Educational Leadership can enroll. Graded on A/F basis only.

## **Educational, School and Counseling Psychology (ESC\_PS)**

**ESC\_PS 1901. Topics in Educational School, and Counseling Psychology - General. 1-3 Credit.**

Topics place holder for lower division courses.

**ESC\_PS 2000. Experiencing Cultural Diversity in the United States. 3 Credits.**

The purpose of this course is to examine cultural diversity in U.S. Society, to increase self-awareness related to worldviews and beliefs about diversity issues, and to increase understanding of the intersections of multiple group identities. Graded on A/F basis only.

**ESC\_PS 2010. Inquiry Into Learning I. 3 Credits.**

This course is designed to focus students on the central themes of learning and teaching. Emphasis will be placed on the interaction of theory, philosophy and practice as related to the field of education. Required for Phase II of the certification program.

**ESC\_PS 2014. Inquiry into Learning I - Field Experience. 1 Credit.**

This field experience course supports the Inquiry into Learning I, component of Phase I. Prerequisite: department consent. Graded on S/U basis only.

**ESC\_PS 2100. Career Explorations. 1-3 Credit.**

Contribution of career development theory to choice of career and/or major. Exploration of personal and social determinants of career choice. Class consists of lecture, laboratory experiences, and use of facilities at the Career Planning and Placement Center.

**ESC\_PS 2350. Transforming Stress: Heart Rate Variability Biofeedback. 1 Credit.**

This course will offer an in-depth opportunity to learn the philosophy and management of stress through a computer-based biofeedback system.

Students will develop a personal practice, track their progress and learn skills in using this technology for a range of concerns.

**ESC\_PS 2400. Learning and Instruction. 2 Credits.**

The nature of human learning processes with implications for instruction. Emphasis on bases of and readiness for learning, types of learning, memory forgetting and transfer, and related topics. Prerequisites: Psychology [PSYCH] 1000.

**ESC\_PS 2500. Child Development. 3 Credits.**

The psychological, intellectual, social, and physical development of children. Prerequisites: Psychology [PSYCH] 1000.

**ESC\_PS 2700. Psychological Perspectives in Sport. 3 Credits.**

Survey of sport psychology literature with focus upon such topics as personality, positive and negative affect, cognitive and behavioral intervention, motivation, aggression, audience effects, team cohesion, team building, leadership, exercise, and multicultural issues.

**ESC\_PS 2901. Topics in Educational School, and Counseling Psychology - General. 1-3 Credit.**

Topics place holder for lower division courses.

**ESC\_PS 3085. Problems in Educational, School, and Counseling Psychology. 1-3 Credit.**

Prerequisite: instructor's consent.

**ESC\_PS 3100. African-American Psychology. 3 Credits.**

(same as Black Studies [BL\_STU] 3100 and Psychology [PSYCH] 3880).

The research, theories and paradigms developed to understand the attitudes, behaviors and psychosocial realities of African-Americans are discussed. Prerequisite: Psychology [PSYCH] 1000.

**ESC\_PS 3200. Black Feminism. 3 Credits.**

This course outlines the basic principles and practices of Black feminism in the United States. Examination of the multiple systems of oppression on Black women's lives and Black women's collective actions against social structures will occur. Prerequisites: Psychology [PSYCH] 1000 or instructor's consent.

**ESC\_PS 3901. Topics in Educational School, and Counseling Psychology - General. 1-3 Credit.**

Topics place holder for lower division courses.

**ESC\_PS 4087. Seminar in Educational, School, and Counseling Psychology. 1-3 Credit.**

Prerequisite: instructor's consent.

**ESC\_PS 4115. Human Learning. 3 Credits.**

An introduction to the basic principles of learning. Focus is on principles of learning which have the greatest utility for professional educators. This course provides a foundation for more advanced courses in human learning. Prerequisite: Education and Counseling Psychology [ESC\_PS] 4100.

**ESC\_PS 4120. Foundations of Counseling Psychology. 3 Credits.**

Survey of contemporary theories underlying individual feminist, family systems, and multicultural approaches to counseling. Introduction to professional and ethical issues in Counseling Psychology. Prerequisite: departmental consent.

**ESC\_PS 4160. Developmental Aspects of Human Learning. 3 Credits.**

Investigates aspects of human development that affect classroom learning. Topics include parenting style, divorce, friendship, mental health, attachment, play, aggression, culture, and media.

**ESC\_PS 4170. Introduction to Applied Statistics. 3 Credits.**

Introduces statistical techniques including descriptive statistics, correlation, simple regression and hypothesis testing. Prerequisite: College Algebra or equivalent. Math Reasoning Proficiency Course.

**ESC\_PS 4185. Health Behavior: Drug and Sexuality Education. 3 Credits.**

Psychological, social, and physical factors related to drug taking and sexuality behaviors. Prerequisites: Learning, Teaching and Curriculum [LTC] 1310 or equivalent or instructor's consent.

**ESC\_PS 4200. Positive Psychology. 3 Credits.**

Using self-actualization and self-determination theory, the course builds on identifying personal strengths in people. An emphasis is placed on developing interventions that promote positive thinking. Some sections graded on either A/F or S/U basis only.

**ESC\_PS 4460. Exploring Mental Health Issues in Schools. 3 Credits.**

This course is an introduction to the mental health challenges found in schools. It provides education professionals with the knowledge and basic skills to promote positive mental health practices in the schools.

**ESC\_PS 4901. Topics in Educational School, and Counseling Psychology - General. 1-3 Credit.**

Topics place holder for lower division courses.

**ESC\_PS 4960. Readings in Educational, School, and Counseling Psychology. 1-3 Credit.**

Prerequisite: instructor's consent.

**ESC\_PS 7000. Foundation of Teacher Prep I. 3 Credits.**

Designed for graduate students seeking teacher certification, this course addresses content and application in comprehensive classroom management, development, behavior management, and diversity. Field work is required and integrated with course content. Prerequisite: Psychology [PSYCH] 1000.

**ESC\_PS 7087. Seminar in Educational, School, and Counseling Psychology. 1-3 Credit.**

Prerequisite: instructor's consent.

**ESC\_PS 7100. Theories and Applications of Educational Psychology. 3 Credits.**

An introduction into the ideas and purpose of Educational Psychology in human development, learning, assessment/measurement and education. Prerequisites: graduate standing and Psychology [PSYCH] 1000.

**ESC\_PS 7115. Human Learning. 3 Credits.**

An introduction to the basic principles of learning. Focus is on principles of learning which have the greatest utility for professional educators. This course provides a foundation for more advanced courses in human learning. Prerequisite: graduate standing and Educational School, and Counseling Psychology [ESC\_PS] 4100/7100. Graded on A/F basis only.

**ESC\_PS 7120. Foundations of Counseling Psychology. 3 Credits.**

Survey of contemporary theories underlying individual, feminist, family systems, and multicultural approaches to counseling. Introduction to professional and ethical issues in Counseling Psychology. Prerequisite: departmental consent.

**ESC\_PS 7130. Parent Counseling and Consultation. 3 Credits.**

For personnel working with parents in professional settings. Examines current family needs and child-rearing practices. Basic skills in diagnosis, counseling, consultation, parent education are developed. Prerequisite: graduate standing Educational School, and Counseling Psychology [ESC\_PS] 4120/7120.

**ESC\_PS 7150. Interviewing and Counseling. 3 Credits.**

Study of beginning interviewing and counseling skills applied to helping relationships in human services professions. Emphasis placed on learning helping skills in small group format. Lab required. Prerequisites: graduate standing and Psychology [PSYCH] 1000 or 1010.

**ESC\_PS 7160. Developmental Aspects of Human Learning. 3 Credits.**

Investigates aspects of human development that affect classroom learning. Topics include parenting style, divorce, friendship, mental health, attachment, play aggression, culture, and media. Prerequisite: graduate standing. Graded on A/F basis only.

**ESC\_PS 7170. Introduction to Applied Statistics. 3 Credits.**

Introduces statistical techniques including descriptive statistics, correlation, simple regression and hypothesis testing. Prerequisite: College Algebra or equivalent. Graded on A/F basis only.

**ESC\_PS 7180. Foundations of Rehabilitation. 3 Credits.**

The vocational and independent living rehabilitation system for disabled persons. Concept of disability, its social psychological implications, and techniques of preparing disabled persons for adult adjustment. Prerequisites: Psychology [PSYCH] 1000.

**ESC\_PS 7185. Health Behaviors: Drug and Sexuality Education. 3 Credits.**

Psychological, social and physical factors related to drug taking and sexuality behaviors. Prerequisites: Learning, Teaching, and Curriculum [LTC] 1310 or equivalent or instructor's consent.

**ESC\_PS 7190. Alcohol Abuse and Rehabilitation I. 3 Credits.**

Covers historical perspective, definition and measurement of the problem, classifications and theories about the etiology of alcoholism. Prerequisites: graduate standing and Educational School, and Counseling Psychology [ESC\_PS] 4120/7120 or 4180/7180 or instructor's consent.

**ESC\_PS 7200. Positive Psychology. 3 Credits.**

Using self-actualization and self-determination theory, the course builds on identifying personal strengths in people. An emphasis is placed on developing interventions that promote positive thinking. Graduate standing required.

**ESC\_PS 7220. Measurement of Cognitive Abilities. 3 Credits.**

Analysis of the function of psychological testing and a critical examination of various achievement, aptitude, and intelligence assessment instruments. Prerequisite: graduate standing.

**ESC\_PS 7460. Exploring Mental Health Issues in Schools. 3 Credits.**

This course is an introduction to the mental health challenges found in schools. It provides education professionals with the knowledge and basic skills to promote positive mental health practices in the schools. Graduate standing required.

**ESC\_PS 8000. Advanced Child Development. 3 Credits.**

Psychological development from birth to adolescence. Examines the influence of maturation and learning upon the acquisition of normal development tasks. Emphasizes the application of current research and theory with the school-age child. Prerequisite: graduate standing and Educational School, and Counseling Psychology [ESC\_PS] 4100/7100.

**ESC\_PS 8010. Advanced Adolescent Development. 3 Credits.**

Analysis of normal adolescent psychological development, including the cognitive, affective, academic, physiological, moral and social parameters. Applications with typical adolescent problems are

emphasized. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 4100/7100.

**ESC\_PS 8015. Child and Adolescent Development. 3 Credits.**

A comprehensive analysis of normal development across the lifespan with a primary focus on children and adolescents. Will investigate the cognitive, affective, academic, physical, moral and social/cultural/racial domains. Examples of atypical development will be discussed. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 4100 or equivalent. Graded on A/F basis only.

**ESC\_PS 8020. Overview of Research Methods. 3 Credits.**

Survey of research design and methods of data collection for masters, educational specialists, and doctoral students. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 7170 or instructor's consent.

**ESC\_PS 8030. Role and Function of the School Psychologist. 3 Credits.**

Introduction to major helping relationship approached in School Psychology, applied to various professional settings. History, current issues, trends, professional organizations, legal/ethical standards, discussed. Prerequisites: enrollment in Educational School, and Counseling Psychology [ESC\_PS] Program.

**ESC\_PS 8040. Counseling Methods and Practices. 3 Credits.**

Introduction to counseling microskills and techniques, with attention to case conceptualization, therapeutic alliance, and counseling process. Laboratory experience in demonstrating skills and the ability to form an effective counseling relationship is required.

**ESC\_PS 8050. Marriage and Family Counseling. 3 Credits.**

Appropriate for students who work with couples and families in a professional setting. Examines major family and marriage theories and research, counseling, skill development communication, and marital/family enrichment. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8040.

**ESC\_PS 8060. Lifespan Development. 3 Credits.**

A comprehensive analysis of normal development across the lifespan with a primary focus on children and adolescents. Will investigate the cognitive, affective, academic, physical, moral, social/cultural/racial, religious/spiritual and sexual domains. Examples of atypical development will be discussed. Prerequisite: Educational, School, and Counseling Psychology [ESC\_PS] 4100 or equivalent. Consent of instructor required. Graduate Standing Required.

**ESC\_PS 8070. Ethical and Legal Issues in Psychological Practice. 3 Credits.**

Legal and ethical concepts and issues relevant to the practice of psychology and student personnel services. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 4120/7120 or instructor's consent.

**ESC\_PS 8082. Foundations of Educational and Psychological Measurement. 3 Credits.**

Basic principles of educational and psychological measurement including test construction, validity, reliability, item analysis, and derived scores. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 4170/7170 or instructor's consent. Graduate standing required.

**ESC\_PS 8085. Problems in Educational, School, and Counseling Psychology. 1-3 Credit.**

Prerequisite: instructor's consent.

**ESC\_PS 8087. Seminar in Educational, School, and Counseling Psychology. 1-3 Credit.**

Prerequisite: instructor's consent. Graded on A/F basis only.

**ESC\_PS 8090. Master's Thesis in Educational, School, and Counseling Psychology. 3-6 Credit.**

Independent research leading to Master's Thesis. Graded on S/U basis only. Prerequisite: advisor's consent.

**ESC\_PS 8095. Research in Educational, School, and Counseling Psychology. 1-6 Credit.**

Supervised research that is independent of master's thesis or doctoral dissertation. Prerequisite: advisor's consent. Graded on S/U basis only.

**ESC\_PS 8100. Psychological Assessment of Children and Adolescents: Cognitive Assessment. 3 Credits.**

Basic principles in intelligence theory and intermediate measurement concepts. Practice in administering, scoring, and interpretation of data from individually administered intelligence tests with school aged children and adolescents. Prerequisites: instructor's consent. Graded on A-F basis only.

**ESC\_PS 8110. Methods in Group Counseling. 3 Credits.**

Study of group counseling methods and techniques. Participation in a group is required. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8040, demonstrated knowledge of ethical principles and departmental consent.

**ESC\_PS 8120. Psychological Assessment of Children and Adolescents: Psychoeducational Assessment. 3 Credits.**

Practice in administering, scoring, and interpretation of data from academic achievement, nonverbal intelligence, memory, adaptive behavior, and perceptual/motor assessments with school-age youth and adolescents. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8100 and instructor's consent.

**ESC\_PS 8125. Professional Iss. in Sch. Psych. I: Hist., Trends & Ethical Pract.. 3 Credits.**

For first-year doctoral students in school psychology. History, current issues, trends, professional organizations, legal-ethical standards of doctoral level school psychology are discussed. The scientist-practitioner model and scientific reasoning process as they apply to both science and practice are reviewed. Prerequisite: Must be admitted to school psychology program.

**ESC\_PS 8130. Psychological Assessment of Adults. 3 Credits.**

Students develop and practice skills in writing psychological reports with special emphasis on assessing psychological social-vocational functioning. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8100.

**ESC\_PS 8135. Foundations of Career Psychology. 3 Credits.**

Theoretical orientations to counseling for career development; nature and structure of work, education, and leisure; work and family issues; career concerns of special populations; use of career information in counseling. Prerequisites: Psychology [PSYCH] 1000.

**ESC\_PS 8140. Psychological Assessment in Childrent and Adolescents: Behavior and Social Emotional Assessment. 3 Credits.**

This course introduces behavior theory, behavioral and social-emotional assessment techniques (including observations, interviewing, rating scales, and projective techniques) and their link to relevant interventions, with a primary focus on school-age youth and adolescents.

**ESC\_PS 8145. Psychological Interventions with Children and Adolescents: Behavioral Intervention. 3 Credits.**

This course will emphasize behavioral theory, assessment, and intervention, including functional behavior assessment, positive behavior supports, and the conceptualization from an individual, systems, and public health perspective. Graded on A/F basis only.

**ESC\_PS 8160. Psychological Interventions with Children and Adolescents: Educational Instruction. 3 Credits.**

This course investigates models of school instruction in both general and special education, and how instruction can be adapted for learners who exhibit a range of academic and psychological problems and disabling conditions. Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 8100, 8120 and instructor's consent.

**ESC\_PS 8165. Psychological Interventions with Children and Adolescents: Evidence- Based Therapies. 3 Credits.**

An introduction to evidence-based child and adolescent psychotherapies, including individual and group interventions. Various aspects will be considered including assessment, diagnosis, and treatment planning. Graded on A/F basis only.

**ESC\_PS 8170. Career Resources in Business and Industry. 2-4 Credit.**

Personnel practices, occupational requirements, and career opportunities and resources in business and industry. Applications are emphasized through on-site visits and use of business-industry-labor personnel. Graded on S/U basis only. Prerequisites: graduate standing and Educational School, and Counseling Psychology [ESC\_PS] 8135 or instructor's consent.

**ESC\_PS 8180. Theory and Practice in Career Psychology. 3 Credits.**

Methods and programs for facilitating the career development of individuals over the life span. Organization and development of activities and programs for all ages emphasized. Prerequisite: graduate standing and Educational School, and Counseling Psychology [ESC\_PS] 8135.

**ESC\_PS 8185. Health Promotion. 3 Credits.**

An overview of the important concepts of health promotion. Emphasis on specific health-related problems and issues, health behavior change, and the design, development implementation, and evaluation of comprehensive health promotion programs. Prerequisites: Learning, Teaching, and Curriculum [LTC] 1310 or equivalent or instructor's consent.

**ESC\_PS 8210. Projective Assessment of Adults. 3 Credits.**

Assessment of personality functioning using projective and inferential testing procedures. Rudimentary skills in using the Rorschach method. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8000 or 8100.

**ESC\_PS 8220. Vocational Assessment of Individuals with Disabilities. 3 Credits.**

This course is an overview of the philosophy of vocational assessment of individuals with disabilities. The course also emphasizes to positive integration of vocational assessment into the rehabilitation counseling process. Assessment practice included. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 7180 and 8082.

**ESC\_PS 8240. Sport in America. 3 Credits.**

Sociological perspectives of sport in America. Attention given to the influence of society on sport as in institution, and the role of sport as an agent of social change. Prerequisite: Sociology [SOCIO] 1000 or Psychology [PSYCH] 1000.

**ESC\_PS 8250. School Psychology Practicum: Introduction to School Services. 1-6 Credit.**

This course is an intro practicum that exposes students to the organization and functions of schools. Students work with psychologists and other school personnel on academic and behavioral interventions to learn how schools serve children and their families. May be repeated for credit. Prerequisite: instructor's consent.

**ESC\_PS 8260. School Psychology Practicum: School-Based. 1-6 Credit.**

Level II School Psychology Practicum provides students with experience in school-based psychological service delivery. Students gain experience with psychoeducational assessment and diagnosis, intervention planning and delivery, consultation, and serving on multidisciplinary teams. May be repeated for credit. Prerequisite: instructor's consent.

**ESC\_PS 8310. Colloquium in Educational Psychology. 1 Credit.**

A course that covers current topics in learning, development, and schooling. Topics include cognitive, affective, academic, physical, moral ethnic/cultural domains. Instructor's consent required. May be repeated for credit.

**ESC\_PS 8320. Advanced Human Learning. 3 Credits.**

A study of behavioral and cognitive theories of learning with an emphasis on those greatest utility for educators. Experimental evidence forming the theoretical base for educational practice is examined. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 2400 or 7100 recommended.

**ESC\_PS 8350. Cognition, Learning and Instruction. 3 Credits.**

Examines the topics of memory and cognition as they apply to the process of learning and instruction. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8320 or instructor's consent.

**ESC\_PS 8360. Advanced Counseling Theories and Interventions. 3 Credits.**

Contemporary theories and interventions of counseling. Advanced study of efficacious techniques. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8340 or 8342. Graded on A/F basis only.

**ESC\_PS 8400. Analysis of Research in Career Psychology. 3 Credits.**

Examination of career development theories, the research supporting the theories, and the practical application of these ideas in career counseling and career programs. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8135.

**ESC\_PS 8410. School Guidance Programs. 3 Credits.**

Provides knowledge and skills in the development and management of school guidance programs including program planning, structuring, implementing, and evaluating. Prerequisite: graduate standing and Educational School, and Counseling Psychology [ESC\_PS] 7120.

**ESC\_PS 8415. Program Evaluation for School Counselors. 3 Credits.**

Program Evaluation is a graduate seminar intended to provide students with the skills needed to evaluate comprehensive guidance and counseling programs. Graded on A/F basis only. Prerequisite: Educational, School and Counseling Psychology [ESC\_PS] 7120 and graduate standing.

**ESC\_PS 8430. Child and Adolescent Mental Health. 3 Credits.**

The course will include an overview of normal development and an investigation into specific deviations in intensity, frequency, and/or

duration of normal development which impact the individual in his or her home, school, and community. Graduate standing or instructor's consent.

**ESC\_PS 8440. School Mental Health: Policy, Law and Ethics. 3 Credits.**

This course is designed to familiarize school-based professionals with policies, laws and ethics associated with children and youth and schools. Graduate standing required.

**ESC\_PS 8450. Diversity Issues for School Personnel. 3 Credits.**

The purpose of this course is to increase the level of multicultural awareness, knowledge, skills, and relationship of school personnel working with diverse student populations. Graduate standing required.

**ESC\_PS 8460. Communication and Collaboration with Children and Families. 3 Credits.**

This course will provide education professionals with the knowledge and basic skills to address common mental health issues through positive and solution focused communication and collaboration. Graduate standing required.

**ESC\_PS 8470. Mental Health Preventions and Interventions for School Personnel. 3 Credits.**

This course explores the role that educators play in promoting the mental wellness of children and adolescents. It examines the principles of prevention and early intervention practices and considers the basic steps for designing, implementing and evaluating evidence based programs. Graduate standing required.

**ESC\_PS 8500. Rehabilitation Counseling. 3 Credits.**

A study of the history and current status of rehabilitation counseling, and the role, theory, and practice of counseling in rehabilitation settings with persons with disabilities.

**ESC\_PS 8510. Medical and Psychological Aspects of Disability. 3 Credits.**

Presentation of medical aspects of major disabilities and their effects upon social, vocational, personal, and economic adjustment. Study of basic restoration and accommodating services.

**ESC\_PS 8515. Sport Psychology. 3 Credits.**

Current topics of research in sport psychology are examined. Topics include: sport personality, attention, activation and anxiety intervention, motivation, sport aggression, audience effects, team cohesion, leadership, and health psychology. Prerequisite: Psychology [PSYCH] 1000.

**ESC\_PS 8520. Job Acquisition for Individuals with Disabilities. 3 Credits.**

Techniques of job development, placement, job analyses of the individual's skill and abilities and the employer's needs, and how to build professional relationships with employers. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 7180.

**ESC\_PS 8530. Developmental Psychopathology and Exceptionality. 3 Credits.**

An investigation into the presentation, diagnosis, and treatment of psychopathologies in individuals, emphasizing causal pathways, risks/resiliency, prevalence, incidence, and continuity/discontinuity of the disorders from research in the field of developmental psychopathology. Graded on A/F basis only.

**ESC\_PS 8540. Theory and Practice in Feminist Therapy. 3 Credits.**

Theory, research, practice standards and current debates within feminist therapy. Includes both examination of topical areas in a seminar format and live observation of feminist therapy. Prerequisites: Educational

School, and Counseling Psychology [ESC\_PS] 8940 or instructor's consent.

**ESC\_PS 8580. Social and Cultural Identity Development. 3 Credits.**

Graduate-level course designed to introduce students to: (a) the dominant social and cultural identity theories and paradigms; (b) how these theories have been operationalized and measured.

**ESC\_PS 8585. Gender Issues in Counseling and Education. 3 Credits.**

Topics include conceptions of gender roles, measurement of gender-related constructs, gender role socialization process, high incidence gender-related problems, and psychoeducational and counseling interventions. Prerequisite: instructor's consent.

**ESC\_PS 8590. Multicultural Counseling Competencies: Theory and Research. 3 Credits.**

This course will introduce students to the current status of multicultural counseling theories and research issues and help students to increase their knowledge of cultural differences in counseling and psychology. Graded on A/F basis only.

**ESC\_PS 8630. Qualitative Methods in Educational Research I. 3 Credits.**

An introductory course intended to provide a broad understanding of the foundations, purposes, and principles of qualitative research in education, as well as an introduction to a variety of qualitative research designs, data collection methods, and analysis strategies. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 7170.

**ESC\_PS 8640. Interviewing, Diagnosis, and Assessment. 3 Credits.**

Introduction to clinical, psychometric assessment, and diagnosis. Data-gathering methods include interviews and tests/inventories of intellectual functioning, abilities, personality, and interests. Students utilize psychological reports to inform assessment, diagnosis and treatment. Prerequisite or Co-requisite: Educational School, and Counseling Psychology [ESC\_PS] 8082.

**ESC\_PS 8655. Item Response Theory. 3 Credits.**

Introduces modern scaling with Item Response Theory, and includes how it can be used to statistically specify information about latent variables and the stimuli (e.g., tests) used to represent them. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 9640, 9650.

**ESC\_PS 8690. Educational Planning and Evaluation. 3 Credits.**

This course addresses major issues and models used in educational program planning and evaluation, including the appropriate use of various evaluation models and different types of data. Prerequisite: departmental inquiry course, Educational School, and Counseling Psychology [ESC\_PS] 8610 and/or 8630.

**ESC\_PS 8830. Quantitative Analysis in Educational Research I. 3 Credits.**

This is the first course in the sequence of statistical analysis methods. Topics covered in this course include statistical inference, simple regression, multiple regression, regression assumptions, regression with categorical predictors, model selection methods polynomial regression, and model validation.

**ESC\_PS 8840. Quantitative Analysis in Educational Research II. 3 Credits.**

This is the second course in the sequence of statistical analysis methods. Topics extend those covered in Quantitative Analysis I and include hypothesis testing, ANOVA, ANCOVA, repeated measures design, random-effects ANOVA, introduction to logistic regression,

polytomous and ordinal regression and linear mixed models (if time permits). Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 7170, 8830.

**ESC\_PS 8870. Public Health Psychology. 3 Credits.**

Study of applications of psychology to behavior, environment, and policy to promote health and prevent disease. The course gives particular attention to behavioral epidemiology and risk/resiliency factors associated with negative outcomes of childhood and adolescents.

**ESC\_PS 8900. Topics in Education, School and Counseling Psychology. 1-3 Credit.**

Topics placeholder for upper division courses. Graduate Standing Required.

**ESC\_PS 8940. Counseling Psychology Practicum. 3-9 Credit.**

Supervised practice of counseling in an approved counseling setting. Graded on S/U basis only. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8040, 8135, 8640 and consent of counseling area faculty. May be repeated.

**ESC\_PS 8941. Practicum and Theory in Group Counseling I. 4 Credits.**

Supervised practice of group facilitation in an approved setting. Formal study of contemporary theories and advanced techniques is integrated with the practice of group facilitation. Graded on S/U basis only. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8110 and instructor's consent.

**ESC\_PS 8942. Practicum and Theory in Group Counseling II. 4 Credits.**

A continuation of Educational School, and Counseling Psychology [ESC\_PS] 8200. Graded on S/U basis only. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8200 and instructor's consent.

**ESC\_PS 8943. Practicum in Multicultural Counseling Interventions. 1-6 Credit.**

Supervised practice of applied multicultural counseling interventions in a wide variety of approved community and university settings. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8340 and either 8570 or 8590. Graded on S/U basis only.

**ESC\_PS 8944. School Psychology Practicum. 1-6 Credit.**

Supervised practice of psychological assessment, intervention and remediation strategies. Prerequisites: departmental consent. May be repeated. Graded on A/F basis only.

**ESC\_PS 8945. Practicum in Marriage and Family Counseling. 3-6 Credit.**

Supervised practice in marriage and family counseling conducted in appropriate laboratories and agencies. Graded on S/U basis only. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8340, 8342, 8160 or 8050 and departmental consent.

**ESC\_PS 8946. Rehabilitation Counseling Internship. 3-9 Credit.**

Field-based counseling internship in a community setting serving individuals with disabilities. 600 hour supervised experience designed to combine theoretical and applied program training aspects. Graded on S/U basis only. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8340, 8520, and 8220.

**ESC\_PS 8947. Practicum in Student Development Programs. 3 Credits.**

Supervised practice in student personnel services in an approved agency. Graded on S/U basis only. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8080.

**ESC\_PS 8948. Field Placement in Counseling/Supervision. 1-12 Credit.**

Students will conduct counseling and/or supervision in approved community agencies under the supervision of licensed practitioners. Prerequisite: completion of 9 credit hours of Educational School, and Counseling Psychology [ESC\_PS] 8340, and consent of the Counseling Area Faculty. Graded on S/U basis only.

**ESC\_PS 8950. Prevention Science Practicum: School and Family Centered Interventions. 3-6 Credit.**

Prevention Science Practicum is an advanced graduate level practicum intended to provide students with the theoretical and practice skills needed to provide effective prevention services to children and families across multiple contexts. An emphasis is placed on school and family centered supports that prevent emotional and behavior problems in children. Graduate standing required. Consent of instructor required. Graded on S/U basis only.

**ESC\_PS 8960. Interdisciplinary Child and Family Practicum. 1-6 Credit.**

This class includes a focus on child/family services with a systems/interdisciplinary approach. Students provide services via a mentorship model (strong supervision initially moving toward autonomy). Services include evaluations, therapy, consultation, psychiatric cross-training, and others. Prerequisite: Educational, School and Counseling Psychology [ESC\_PS] 8040. Consent of instructor required. Course graded on S/U basis only. Graduate Standing Required.

**ESC\_PS 8980. Field Experience in Counseling. 3-9 Credit.**

Graded on S/U basis only. Prerequisite: instructor's consent.

**ESC\_PS 8990. Career Development Theory for Women. 3 Credits.**

Consideration of the relevance of theories of career development for women, and their application to the counseling of women. Supervised clinical experience in the application of theories to counseling high school age women.

**ESC\_PS 9000. Multicultural Issues in Counseling. 3 Credits.**

This course covers the research and theories of counseling racial/ethnic minorities and gays, lesbians, and bisexuals in the U.S. Examination of personal values and education about the interrelationship between race, class, gender, and sexuality are accomplished via structured activities. Prerequisite: None, Educational School, and Counseling Psychology [ESC\_PS] 8340 recommended.

**ESC\_PS 9010. Building Cross-Cultural Competencies: Taiwan Up Close. 3 Credits.**

The primary purpose of the course is to promote the development of cross-cultural knowledge, awareness, and skills for applied psychologists. The first part of the course occurs at MU in preparation for part two, a 10-day professional cultural immersion in Taiwan. Prerequisite: Educational School and Counseling Psychology [ESC\_PS] 9000 preferred; instructor's consent.

**ESC\_PS 9040. Cross-Cultural Issues in Counseling: International Focus. 3 Credits.**

This course focuses on developing students' awareness, knowledge, and skills in cross-national counseling and research in equipping the

next generation of counseling psychologists' competencies related to the globalization trend of counseling psychology. Prerequisite: Educational, School, and Counseling Psychology [ESC\_PS] 9000. Graded on A/F basis only. Graduate Standing Required.

**ESC\_PS 9050. Biofeedback in Psychological Practice. 3 Credits.**

Use of biofeedback in achieving voluntary self-regulation and control of stress related behaviors. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8340 or 8342 and instructor's consent.

**ESC\_PS 9087. Advisor's Seminar. 1 Credit.**

Prerequisite: departmental consent.

**ESC\_PS 9090. Doctoral Dissertation Educational School & Counseling Psychology. 1-12 Credit.**

Independent research leading to dissertation. Graded on S/U basis only. Prerequisite: departmental consent.

**ESC\_PS 9091. Internship in Counseling Psychology. 1-6 Credit.**

Supervised experience in counseling psychology on half- or full-time basis in approved internship station. Graded on S/U basis only. Prerequisite: departmental consent. May be repeated.

**ESC\_PS 9092. Internship in School Psychology. 1-6 Credit.**

Supervised practice in school psychology in an educational setting. May be repeated. Graded on S/U basis only. Prerequisite: departmental consent.

**ESC\_PS 9093. Doctoral Internship in School Psychology. 1-6 Credit.**

Supervised practice in doctoral-level school psychology in an institutional or applied setting. Prerequisite: departmental consent. May be repeated. Graded on S/U basis only.

**ESC\_PS 9125. Professional Iss. in Sch. Psych. II: Rsrch. Design & Application. 3 Credits.**

For first-year doctoral students in school psychology. Includes study of research design and methodological issues in the field of school psychology. Prerequisite: Must be admitted to school psychology doctoral program.

**ESC\_PS 9126. Prevention Science Research Design and Analysis. 1-3 Credit.**

Prevention Science Research is a graduate seminar intended to provide students with the theoretical and empirical foundations of prevention science. In particular, students will learn how to conceptualize problems from a prevention science perspective and design and evaluate preventive interventions using advanced methodologies. Opportunities for community based participatory research including research design and analysis, papers and briefs, grantwriting, and community collaborations regarding prevention programming particularly pertaining to children's mental health. Graduate standing required. Consent of instructor required.

**ESC\_PS 9250. School Psychology Practicum: Community-Based. 1-6 Credit.**

This course is an advanced practicum for students providing school psychology services in non-school settings. Students develop higher-level skills in the areas of case coordination, diagnostic decision-making, intervention, and systems change. May be repeated for credit. Prerequisite: instructor's consent.

**ESC\_PS 9260. Policy Practicum in Professional Psychology. 1-3 Credit.**

Policy Practicum is an advanced practicum focused on macro level skills for shaping policy and systems-level intervention. Students work within agencies that establish policy for special education, mental health, and

other education/psychology-related issues. May be repeated for credit. Prerequisite: instructor's consent.

**ESC\_PS 9300. Psychoanalytic Counseling. 3 Credits.**

A study of the contribution of classical and contemporary psychoanalysis to counseling theory, research and practice. Examination of theoretical and clinical material in a seminar format. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8340, 8342 and instructor's consent.

**ESC\_PS 9400. Theories and Practices in Supervision. 3 Credits.**

Instruction and practice in the supervision of psychological services conducted in appropriate laboratories and agencies. Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 8940 or 8944 and instructor's consent. Sections titled Counseling Psychology are graded on S/U basis only. Sections titled School Psychology are on A-F basis only.

**ESC\_PS 9445. College Student Development. 3 Credits.**

(same as Educational Leadership and Policy Analysis [ED\_LPA] 9445). Emphasis on college student development theory and its application in student affairs work.

**ESC\_PS 9446. Student Affairs Administration. 3 Credits.**

(same as Educational Leadership and Policy Analysis [ED\_LPA] 9446). History, philosophy, theory, and issues pertinent to student affairs work.

**ESC\_PS 9450. Motivation. 3 Credits.**

Investigates human motivation applied to performance in schools, athletics, and personal life. Topics include goals, attributions, self-efficacy, interest, cultural differences, and rewards. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8320 or equivalent. Graded on A/F basis only.

**ESC\_PS 9460. Health Behavior Change Research. 3 Credits.**

(Same as Nursing [NURSE] 9460). Doctoral seminar focusing on theories, measurement, and methods for conducting health behavior change research. Prerequisite: Nursing [NURSE] 9120, Pre/Co-requisite: Nursing [NURSE] 9410, or faculty consent.

**ESC\_PS 9530. Scientific Fdns of Counseling Psych I: Prof Iss &. 3 Credits.**

For first-year doctoral students in counseling psychology. This course focuses on the history of counseling psychology, in and scientific reasoning processes as they apply to both science and practice.

**ESC\_PS 9540. Scientific Foundations of Counseling Psych II: Rsrch, Dsgn & Appl. 3 Credits.**

For first-year doctoral students in applied psychology. Includes study of research design and methodological issues in the field of counseling psychology. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 9530.

**ESC\_PS 9550. Scientific Writing in Counseling Psychology. 3 Credits.**

This course focuses on the technical skills needed for developing a scientific research proposal in counseling psychology. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 9530 and 9540 and instructor's consent.

**ESC\_PS 9560. Psychological Consultation: Schools. 3 Credits.**

The individual psychological consultation process between the mental health professional and school personnel. Techniques, models, research roles, and responsibilities are discussed. Graded on A/F basis only.

**ESC\_PS 9610. Applied Sport Psychology. 3 Credits.**

Building upon the knowledge base of sport psychology, this course integrates and synthesizes student's understandings of the wide array of concepts and theories of the field into meaningful applications and strategies aimed at enhancing the sport experience of others. A case study approach will be employed. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8515.

**ESC\_PS 9620. Qualitative Methods in Educational Research II. 3 Credits.**

The focus of each section of this course would be in-depth study of a specific method (e.g., case study, ethnographic, grounded theory) and various approaches (e.g., critical theory, dialogical). Students will be expected to undertake a substantive pilot study and prepare a qualitative text. Prerequisite: Educational School, and Counseling Psychology [ESC\_PS] 8630.

**ESC\_PS 9640. Introduction to Theory of Educational Measurement. 3 Credits.**

Classical and modern test theory, including IRT, generalizability theory and test bias. Also covered are advanced strategies for investigating reliability and validity. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 7170, 8082.

**ESC\_PS 9650. Application of Multivariate Analysis in Educational Research. 3 Credits.**

The focus of this course will be on applications of multivariate analysis in educational research. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 8610 and 8620 or equivalent and instructor's consent.

**ESC\_PS 9710. Structural Equation Modeling. 3 Credits.**

Simultaneous analysis of relationships among variables. Topics included are path analysis, confirmatory factor analysis, hybrid models, and special types of structural models involving longitudinal data, multiple groups and analysis of means. Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 7170, 8610, 8620, 9650; consent required. May be repeated for credit.

**ESC\_PS 9720. Hierarchical Linear Modeling. 3 Credits.**

Hierarchical Linear Modeling (HLM), including multilevel and longitudinal approaches, in applied research settings for the social, educational, psychological, and health-related sciences. Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 7170, 8610, 8620, 9650; consent required. May be repeated for credit.

**ESC\_PS 9900. Topics in Educational Leadership and Policy Analysis. 1-3 Credit.**

Topics placeholder for upper division courses.

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## Electrical And Computer Engineering (ECE)

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**ECE 1000. Introduction to Electrical and Computer Engineering. 2 Credits.**

Introduction to the basic principles of electrical and computer engineering through hands-on activity. Course includes fundamentals of programming using Matlab, applied to electrical and computer engineering problems.

**ECE 1001. Experimental Course. 1-99 Credit.**

For freshman-level students. Content and number of credit hours to be listed in Schedule of Courses.



**ECE 1210. Introduction to Logic Systems. 3 Credits.**

Introduces basic tools, methods and procedures to design combinational and sequential digital circuits and systems. Topics include number systems, Boolean algebra, logic minimization, circuit design, memory elements, and finite state machine design. Graded on A-F basis only.

**ECE 2001. Experimental Course. 1-99 Credit.**

For sophomore-level students. Content and number of credit hours to be listed in Schedule of Courses.

**ECE 2100. Circuit Theory I. 4 Credits.**

DC circuit analysis, inductors and capacitors, first order response, AC circuit analysis, single-phase AC power. Co-requisite: Mathematics [MATH] 2300. Graded on A/F basis only.

**ECE 2110. Experimental Electrical Engineering I. 3 Credits.**

Application of standard electronic test equipment to basic experimental tasks of measurement and characterization of electronic phenomena and devices. Prerequisites: Engineering [ENGINR] 2100 concurrently.

**ECE 3110. Electrical and Computer Engineering Projects. 3 Credits.**

Open-ended design projects which encourage innovative solutions to design and measurement problems. Students teams complete several projects from different areas. Both oral and written presentations emphasized. Prerequisites: Statistics [STAT] 4710 and Electrical and Computer Engineering [ECE] 3210 and 3410. Restricted to ECE students only or instructor's consent. Graded on A/F basis only.

**ECE 3210. Microprocessor Engineering. 4 Credits.**

Introduction to microprocessor architectures and programming; memory, memory management and cache organizations, bus configurations and timing implications; parallel I/O and serial communication interfaces. Prerequisite: Electrical and Computer Engineering [ECE] 1210 and Computer Science [CMP\_SC] 1040 or 1050.

**ECE 3220. Computing for Embedded Systems. 3 Credits.**

Software/Hardware development for embedded systems, including memory, I/O and interrupts; an overview of C and C++, class structures in object oriented programming; software development with UML and testing and debugging strategies. Prerequisites: Electrical and Computer Engineering [ECE] 3210 and C++ or Java. Graded on A/F basis only.

**ECE 3230. Algorithms and Software Design. 3 Credits.**

Covers basic algorithms including: arithmetic operations, sorting, string processing, parsing, hashing, and tree and graph manipulations. The C language and UNIX operating system are used as vehicles for illustration and practice in use of the algorithms and in the application of software design techniques. Prerequisite: Electrical and Computer Engineering [ECE] 2210.

**ECE 3410. Electronic Circuits and Signals I. 4 Credits.**

Electron Devices, modeling and applications to basic electronic circuits, including RC amplifiers and power supplies. Co-requisite: Electrical and Computer Engineering [ECE] 3810.

**ECE 3470. Introduction to Power Engineering. 3 Credits.**

Real and reactive power in single and three-phase ac circuits; magnetic circuits and transformers; energy conversion, DC machines, induction and synchronous machines; power transmission and distribution. Co-requisite Electrical and Computer Engineering [ECE] 3810. Graded on A/F basis only.

**ECE 3510. Electromagnetic Fields. 3 Credits.**

Elements of vector analysis, transmission line theory, electrostatics, magnetostatics, time varying fields and plane waves. Prerequisite:

Physics [PHYSICS] 2760, Mathematics [MATH] 4100. Graded on A/F basis only.

**ECE 3610. Semiconductors and Devices. 3 Credits.**

Crystal structure; quantum aspects of energy, radiation and matter; quantum mechanics and energy bands in solids; electronic and optical properties of semiconductors; p-n junctions and diodes; bipolar and field-effect transistors. Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 3810. Circuit Theory II. 4 Credits.**

Impulse and step responses, RLC circuits, classical differential equations solutions, complex plane stability, frequency and Bode Analysis, Resonance, Laplace transforms, two-port networks, mutual inductance and transformers. Prerequisites: Electrical and Computer Engineering [ECE] 2100 and Mathematics [MATH] 4100 concurrently. Graded on A/F basis only.

**ECE 3830. Signals and Linear Systems. 3 Credits.**

Transform Analysis of Signals and Linear Systems. Laplace transforms, z-transforms, Fourier series and transforms. Prerequisite: Electrical and Computer Engineering [ECE] 3810.

**ECE 4001. Topics in Electrical and Computer Engineering. 3-4 Credit.**

Current and new technical developments in electrical engineering. Prerequisite: senior standing.

**ECE 4020. Energy Systems and Resources. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 4315). Analysis of present energy usage in Missouri, USA and the world, evaluation of emerging energy technologies and trends for the future. Economics and environmental impact of the developed technologies. Prerequisite: Engineering [ENGINR] 2300.

**ECE 4030. Introduction to Nuclear Reactor Engineering. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 4346). Engineering principles of nuclear power systems, primarily for the production of electrical energy. Prerequisites: Engineering [ENGINR] 1200, 2300.

**ECE 4040. Introduction to Nuclear Physics. 3 Credits.**

Introduction of Quantum mechanics for non-physics majors. Course topics include nuclear properties; alpha, beta and gamma radioactive decay; and nuclear reactions. Graded on A-F basis only. Prerequisite: senior standing or graduate standing in engineering or equivalent mathematical preparation.

**ECE 4085. Problems in Electrical and Computer Engineering. 1-3 Credit.**

Analytical or experimental problems pertaining to electric circuits, machines, fields or electronics. Prerequisites: 12 hours Electrical and Computer Engineering credit or instructor's consent.

**ECE 4150. Solid State Area Laboratory. 1 Credit.**

Laboratory experiments involved with solid state theory and integrated circuit fabrication and testing. Prerequisites: Electrical and Computer Engineering [ECE] 4650 and 4670.

**ECE 4170. Control Systems Laboratory. 1 Credit.**

Experiments in computer process control and industrial automation; automated process modeling; control algorithm design; control simulation; direct digital real-time control; transducers; computer interfacing; industrial control mechanisms; Programmable Logic Controllers. Prerequisites: Electrical and Computer Engineering [ECE] 4310, 3210, 3110.

**ECE 4220. Real Time Embedded Computing. 3 Credits.**

Embedded systems development with real time constraints including RTOS, task management and synchronization, real time scheduling algorithms, deadlocks, performance analysis and optimization, interfacing to external devices, and device drivers. Prerequisite: Electrical and Computer Engineering [ECE] 3220. Graded on A/F basis only.

**ECE 4250. VHDL and Programmable Logic Devices. 4 Credits.**

Design techniques including module definition, functional partitioning, hardware design language descriptions and microprogramming; design examples include arithmetic units, programmable controllers, and microprocessors. Prerequisites: Electrical and Computer Engineering [ECE] 3210.

**ECE 4270. Computer Organization. 4 Credits.**

Advanced computer architectures and programming; memory, memory management and cache organizations, parallel processing, graphical processor units for general programming. Prerequisite: Electrical and Computer Engineering [ECE] 3210.

**ECE 4280. Network Systems Architecture. 3 Credits.**

The course covers network systems interconnects and switch fabrics, network considerations: and relevant networking applications at the network, transport and application layer. Graded on A-F basis only. Prerequisite: ECE 3210, ECE 3220.

**ECE 4310. Feedback Control Systems. 4 Credits.**

(same as Biological Engineering [BIOL\_EN] 4310). System modeling and time and frequency response, closed loop control, stability, continuous system design, introduction to discrete time control, software and hardware experiments on compensator design and PID control. Prerequisite: Mathematics [MATH] 4100. Graded on A/F basis only.

**ECE 4330. Introduction to Mechatronics and Robotic Vision. 4 Credits.**

Covers 1) mechatronic systems; 2) the mathematical tools used to model industrial and mobile robots; and 3) vision sensors, their underlying models and algorithms that allow us to control and interact with robots. Prerequisites: Electrical and Computer Engineering [ECE] 3220 or 4220 or a C/C++ languages.

**ECE 4340. Building Intelligent Robots. 4 Credits.**

(same as Computer Science [CMP\_SC] 4730). Covers the design and development of intelligent machines, emphasizing topics related to sensor-based control of mobile robots. Includes mechanics and motor control, sensor characterization, reactive behaviors and control architectures. Prerequisites: junior standing and programming experience in one of the following programming languages: Basic, C, C++, or Java.

**ECE 4350. Programmable Logic Controllers. 4 Credits.**

Hardware and software aspects of PLC's; computer/PLC Communications; developing ladder logic programs; interfacing I/O devices, including sensors, to the PLC; labeling and documentation; utilizing analog capabilities; applications; developing Supervisory Control and Data Acquisitions (SCADA) applications. Prerequisite: junior standing or above.

**ECE 4370. Automatic Control System Design. 3 Credits.**

Techniques for feedback system design and analysis; compensation using root locus and frequency-domain methods; state-variable design methods; techniques for nonlinear systems analysis and design; sample-data control systems. Prerequisite: Electrical and Computer Engineering [ECE] 4310.

**ECE 4390. Computer Process Control. 3 Credits.**

Role of digital computer in process control; digital controller design; computer interfacing; transducers; programmable logic controllers; process modeling; introduction to robotics. Prerequisites: Electrical and Computer Engineering [ECE] 4310 and 3210.

**ECE 4410. Power Electronics I. 4 Credits.**

Power electronic device characteristics, important circuit and component concepts, loss mechanisms and thermal analysis, phase controlled rectifiers, dc-dc converters, and dc-ac inverters. Includes laboratory projects. Prerequisites: Electrical and Computer Engineering [ECE] 3410.

**ECE 4430. Electronic Circuits and Signals II. 3 Credits.**

Advanced study of electronic devices including frequency response of amplifiers, nonlinear effects in transistor amplifiers, oscillators, and feedback amplifiers. Prerequisites: Electrical and Computer Engineering [ECE] 3830 and 3410.

**ECE 4450. Amplifier Analysis and Design. 3 Credits.**

Design of electronic networks with application to instrumentation, control and communications systems. Practical specifications and problems in design. Lectures and projects. Prerequisite: Electrical and Computer Engineering [ECE] 4430.

**ECE 4470. Sustainable Electrical Energy Resources. 3 Credits.**

Analysis of renewable electrical energy resources from both the utility and distributed resource perspective. Covers safety, metering and power quality issues associated with coupling distributed resources to the utility grid. Prerequisites: Electrical and Computer Engineering [ECE] 3470 or Engineering [ENGINR] 2100.

**ECE 4510. Pulsed Power Engineering. 3 Credits.**

Concepts of energy generation and storage systems used in pulse power engineering, high power opening and closing switches, high voltage engineering, grounding and shielding, high voltage safety. Prerequisite: Electrical and Computer Engineering [ECE] 3510.

**ECE 4530. Photonics. 3 Credits.**

Introduction to the physical principles and optical materials used in diagnostics, optical communications, semiconductor and solid state lasers, optical fiber transmissions, optical detectors, optical signal processing. Prerequisite: Electrical and Computer Engineering [ECE] 3510.

**ECE 4550. Introduction to Plasmas. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 4375). Equations of plasma physics, interaction of waves and plasmas; plasma sheaths and oscillations; measurements and applications. Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 4570. Lasers and Their Applications. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 4382). An introductory course in lasers. The course treats the subject from both a conceptual viewpoint and from the application of Maxwell's equations, to develop the optical theory for lasers. The course includes approximately 10 classroom hours of laboratory work with lasers. Prerequisites: Physics [PHYSICS] 2760 and Mathematics [MATH] 4110.

**ECE 4580. Computational Neuroscience. 4 Credits.**

(same as Biological Science [BIO\_SC] 4580 and Biological Engineering [BIOL\_EN] 4575). Interdisciplinary course in biology and quantitative sciences with laboratory and modeling components. Explores basic computational and neurobiological concepts at the cellular and network level. Introduction to neuronal processing and experimental methods in

neurobiology; modeling of neurons and neuron-networks. Prerequisite: Mathematics [MATH] 1500 or equivalent. Graded on A/F basis only.

**ECE 4610. Physical Electronics. 3 Credits.**

Introduction to physical principles of semiconductors and semiconductor devices; gas, solid state, and semiconductors lasers; electro-optics; plasma physics and gaseous electronics; materials interaction with electric and magnetic fields. Prerequisite: Electrical and Computer Engineering [ECE] 3510.

**ECE 4620. Introduction to BioMEMS. 3 Credits.**

Study of BioMEMS devices and applications. Topics cover BioMEMS including overview of microfabrication techniques, common bioMEMS material, microfluidic principles, microfluidic devices, drug delivery, biomedical microdevices for neural implants, patch-clamping and single cell based analysis systems, microelectroporation, DNA microarrays, Polymerase Chain Reaction and biopolymers, chemical and gas sensors and biosensors. Graded on A/F basis only.

**ECE 4630. Introduction to Optical Electronics. 3 Credits.**

Principles, devices and materials used to generate, modulate, and detect optical radiation. Review of important properties of light and semiconductors. Light-emitting diodes and lasers. Electro-optic modulation. Thermal and quantum detection. Emphasis on semiconductor-based devices and application to fiber-optical communications. Prerequisite: Electrical and Computer Engineering [ECE] 3610.

**ECE 4640. MEMS Laboratory. 4 Credits.**

The main objective of this course is to provide hands-on skills for the interdisciplinary Microelectromechanical Systems (MEMS). It puts emphasis on the practical aspects of design, fabrication, test, and characterization of micro/nano devices and systems. Prerequisites: Physics [PHYSICS] 2760, Chemistry [CHEM] 1320, or Electrical and Computer Engineering [ECE] 2100; instructor's consent.. Graded on A/F basis only.

**ECE 4650. Semiconductor Device Theory. 3 Credits.**

Band theory, equilibrium and non-equilibrium semiconductor electronics, junction theory, p-n junction devices, bipolar and field effect transistors including SPICE simulation. Prerequisite: Electrical and Computer Engineering [ECE] 3610.

**ECE 4655. Digital image Processing. 3 Credits.**

(same as Computer Science [CMP\_SC] 4650). This course provides fundamentals of digital image processing hardware and software including digital image acquisition, image display, image enhancement, image transforms and segmentation. Prerequisites: Statistics [STAT] 4710 and Computer Science [CMP\_SC] 2050 or instructor's consent.

**ECE 4670. Microelectronic Fabrication. 4 Credits.**

Basic silicon integrated circuit fabrication processes, basic techniques of wafer processing, economics of fabrication and resulting devices properties, interdependence of process flow and device design. Accompanying laboratory. Prerequisite: Electrical and Computer Engineering [ECE] 3610.

**ECE 4675. Digital Image Compression. 3 Credits.**

(same as Computer Science [CMP\_SC] 4670) This course provides basic concepts and theorems in information theory, discrete cosine transform, discrete wavelet transform, quantizer design, bit allocation, and rate-distortion analysis and practical coding and communication system design, (such as Huffman coding, arithmetic coding, variable length

coding, motion estimation, JPEG.) Prerequisite: Statistics [STAT] 4710 or instructor's consent. Graded on A/F basis only.

**ECE 4690. Design and Simulation of VLSI Circuits. 4 Credits.**

Design of CMOS integrated circuits with emphasis on analog applications. Device models are developed for circuit simulation. Lecture and laboratory. Prerequisite: Electrical and Computer Engineering [ECE] 4670.

**ECE 4710. Communications Systems. 3 Credits.**

Concepts of communication systems, signal analysis and power spectrum density, signal transmission and filtering, linear modulation, exponential modulation, sampling, baseband digital communication, modulated digital communication, spread spectrum communication. Prerequisites: Electrical and Computer Engineering [ECE] 3830.

**ECE 4720. Introduction to Machine Learning and Pattern Recognition. 3 Credits.**

(Same as Computer Science [CMP\_SC] 4720) This course provides foundation knowledge to the basic methods in machine learning and pattern recognition (MLPR). MLPR addresses the problems of programming computers to optimize certain performance criteria by using example data or expert knowledge and it has wide applications. Prerequisites: Computer Science [CMP\_SC] 2050 and Statistics [STAT] 4710 or instructors consent.

**ECE 4730. Introduction to Wireless Communication System. 3 Credits.**

Principles of wireless communication analysis and design. Digital communication basics, cellular radio, wireless PCS communications, multiple access techniques, channel coding and equalization, and standards of digital cellular/PCS systems.

**ECE 4770. Electromechanical Conversion I. 3 Credits.**

Theory and applications of electric machinery. Steady state and transient performance analysis of AC and DC electrical machines with emphasis on internal electromagnetic phenomena. Fundamentals of electronic speed controls. Prerequisite: Electrical and Computer Engineering [ECE] 3470.

**ECE 4830. Introduction to Digital Signal Processing. 4 Credits.**

Concepts, analytical tools, design techniques used in computer processing of signals; signal representation, sampling, discrete-time systems analysis, recursive and non-recursive filters, design/implementation, discrete Fourier transform. Prerequisites: Electrical and Computer Engineering [ECE] 2110, 2210, 3830.

**ECE 4850. Image Processing. 3 Credits.**

(same as Computer Science [CMP\_SC] 4650). Fundamentals of digital image processing hardware and software including digital image acquisition, image display, image enhancement, image transforms and segmentation.

**ECE 4870. Introduction to Computational Intelligence. 3 Credits.**

(same as Computer Science [CMP\_SC] 4770). Introduction to the concepts, models, and algorithms for the development of intelligent systems from the standpoint of the computational paradigms of neural networks, fuzzy set theory and fuzzy logic, evolutionary computation and swarm optimization. Prerequisite: some exposure to rigorous axiomatic mathematical development of a topic (as can be found in most senior/graduate level math or statistics courses) is needed to appreciate some of the development of the theory. Also, the ability to program (well) in some high level language is essential to preform the computer projects. Graded on A/F basis only.

**ECE 4880. Micro/Nano Systems. 3 Credits.**

Micro/nano systems including micromachining, material properties, micro-actuators, optical, RF, inertial/mechanical and acoustic M/NEMS and M/Nanofluidic systems. Prerequisite: Electrical and Computer Engineering [ECE] 3610 or instructor's consent. Graded on A/F basis only.

**ECE 4910. Microwave Systems. 3 Credits.**

Theory and applications of transmission systems with emphasis on transmission lines at low and high frequencies. Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 4920. Microwave Engineering. 3 Credits.**

Wave equation, plane wave propagation, transmission line theory, Smith Chart analysis, impedance transformers, waveguides modes, basic antenna theory, impedance matching and tuning, basic microstrip and stripline circuits.

**ECE 4930. Intermediate Electromagnetics. 4 Credits.**

Course covers transmission lines, waveguides, microstrip electromagnetic circuits, and radiating systems. Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 4940. Antenna Theory, Design and Laboratory. 4 Credits.**

Introduction to antenna theory, design and laboratory. Emphasis on engineering aspects of antenna systems, transmitting and receiving antenna parameters, various antennas. Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 4950. Microwave Principles. 4 Credits.**

Maxwell's Equations, transmission lines, plane wave propagation and reflection, waveguides, resonant cavities, microwave devices and components, radiation, radio wave propagation. Lecture and laboratory. Prerequisites: Electrical and Computer Engineering [ECE] 3510 and 3410.

**ECE 4970. Senior Capstone Design. 3 Credits.**

Group Design Projects. Design methodology, project management, development of specifications, examination of alternatives, preparation of proposal. Lectures on safety, ethics, professionalism, and economics. Oral and written reports. Not for graduate credit. Prerequisites: Electrical and Computer Engineering [ECE] 3110 and senior standing. Restricted to ECE students only or instructor's consent.

**ECE 4980. Senior Capstone Design II. 2 Credits.**

(same as Computer Science [CMP\_SC] 4980). Completion of Electrical and Computer Engineering [ECE] 4970 design project. Design prototyping, testing, evaluation and preparation of documentation. Lectures on ethics, professionalism, safety, economic consideration. Oral and written reports. Not for graduate credit. Prerequisites: senior standing and Electrical and Computer Engineering [ECE] 4970.

**ECE 4990. Undergraduate Research in Electrical Computer Engineering. 1-3 Credit.**

Supervised independent study or project in electrical or computer engineering, culminating in a written report.. Prerequisites: Undergraduate Program Director's consent.

**ECE 4995. Undergraduate Honors Research in Electrical Computer Engineering. 1-3 Credit.**

Independent investigation or project in electrical or computer engineering to be presented as an undergraduate honors thesis. Prerequisites: Participation in the Electrical and Computer Engineering [ECE] Honors Program.

**ECE 7001. Advanced Topics in Electrical and Computer Engineering. 3-4 Credit.**

Current and new technical developments in electrical engineering. Prerequisite: graduate standing.

**ECE 7010. Digital Computer Applications in Engineering. 3 Credits.**

Use of digital computer for solution of engineering problems involving roots of equations, simultaneous equations, curve fitting, integration, differentiation and differential equations. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**ECE 7020. Energy Systems and Resources. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 7315). Analysis of present energy usage in Missouri, USA and the world, evaluation of emerging energy technologies and trends for the future. Economics and environmental impact of the developed technologies. Prerequisite: graduate standing and Engineering [ENGINR] 2300.

**ECE 7030. Introduction to Nuclear Reactor Engineering. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 7346). Engineering principles of nuclear power systems, primarily for the production of electrical energy. Prerequisites: graduate standing and Engineering [ENGINR] 1200, 2300.

**ECE 7040. Introduction to Nuclear Physics. 3 Credits.**

Introduction of Quantum mechanics for non-physics majors. Course topics include nuclear properties; alpha, beta and gamma radioactive decay; and nuclear reactions. Graded on A-F basis only. Prerequisite: senior standing or graduate standing in engineering or equivalent mathematical preparation.

**ECE 7150. Solid State Area Laboratory. 1 Credit.**

Laboratory experiments involved with solid state theory and integrated circuit fabrication and testing. Prerequisites: graduate standing and Electrical and Computing Engineering [ECE] 4650 and 4670.

**ECE 7170. Control Systems Laboratory. 1 Credit.**

Experiments in computer process control and industrial automation; automated process modeling; control algorithm design; control simulation; direct digital real-time control; transducers; computer interfacing; industrial control mechanisms; Programmable Logic Controllers. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 4310, 3210, 3110.

**ECE 7220. Real Time Embedded Computing. 3 Credits.**

Embedded systems development with real time constraints including RTOS, task management and synchronization, realtime scheduling algorithms, deadlocks, performance analysis and optimization, interfacing to external devices, and device drivers. Prerequisite: Electrical and Computer Engineering [ECE] 3220. Graded A-F basis only. Graduate Standing Required.

**ECE 7250. VHDL and Programmable Logic Devices. 4 Credits.**

Design techniques including module definition, functional partitioning, hardware design language descriptions and microprogramming; design examples include arithmetic units, programmable controllers, and microprocessors. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3210.

**ECE 7270. Computer Organization. 4 Credits.**

Advanced computer architectures and programming; memory, memory management and cache organizations, parallel processing, graphical processor units for general programming. Prerequisite: Electrical and Computer Engineering [ECE] 3210.

**ECE 7280. Network Systems Architecture. 3 Credits.**

The course covers network systems interconnects and switch fabrics, network considerations: and relevant networking applications at the network, transport and application layer. Graded on A-F basis only. Prerequisite: ECE 3210, ECE 3220.

**ECE 7310. Feedback Control Systems. 4 Credits.**

(same as Biological Engineering [BIOL\_EN] 7310). System modeling and time and frequency response, closed loop control, stability, continuous system design, introduction to discrete time control, software and hardware experiments on compensator design and PID control. Prerequisites: graduate standing and Mathematics [MATH] 4100.

**ECE 7330. Introduction to Mechatronics and Robotic Vision. 4 Credits.**

Introduces robotics; robot system characteristics; robot motive power systems; geometric structure of robots; sensors and feedback; control applications and algorithms; data acquisition and output actuation function; robots and AI; microprocessor applications. Lecture and Laboratory. Prerequisites: graduate Electrical and Computer Engineering [ECE] 3220 or 4220 or a C/C++ Language course.

**ECE 7335. Nuclear Safeguards Science and Technology. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 7335). This course provides an overview of nuclear materials management and safeguards, including physical protection systems, material accounting and control, monitoring, and regulatory issues. Prerequisite: Nuclear Engineering [NU\_ENG] 4303/7303.

**ECE 7340. Building Intelligent Robots. 4 Credits.**

(Same as Computer Science [CMP\_SC] 7730) Covers the design and development of intelligent machines, emphasizing topics related to sensor-based control of mobile robots. Includes mechanics and motor control, sensor characterization, reactive behaviors and control architectures. Prerequisites: graduate standing and some programming experience.

**ECE 7350. Programmable Logic Controllers. 4 Credits.**

Hardware and software aspects of PLC's; computer/PLC Communications; developing ladder logic programs; interfacing I/O devices, including sensors, to the PLC; labeling and documentation; utilizing analog capabilities; applications; developing Supervisory Control and Data Acquisitions (SCADA) applications. Prerequisite: junior standing or above.

**ECE 7370. Automatic Control System Design. 3 Credits.**

Techniques for feedback system design and analysis; compensation using root locus and frequency-domain methods; state-variable design methods; techniques for nonlinear systems analysis and design; sample-data control systems. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 4310.

**ECE 7390. Computer Process Control. 3 Credits.**

Role of digital computer in process control; digital controller design; computer interfacing; transducers; programmable logic controllers; process modeling; introduction to robotics. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 4310 and 3210.

**ECE 7410. Power Electronics I. 4 Credits.**

Power electronic device characteristics, important circuit and component concepts, loss mechanisms and thermal analysis, phase controlled rectifiers, dc-dc converters, and dc-ac inverters. Includes laboratory projects. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3410.

**ECE 7430. Electronic Circuits and Signals II. 3 Credits.**

Advanced study of electronic devices including frequency response of amplifiers, nonlinear effects in transistor amplifiers, oscillators, and feedback amplifiers. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3830 and 3410.

**ECE 7450. Amplifier Analysis and Design. 3 Credits.**

Design of electronic networks with application to instrumentation, control and communications systems. Practical specifications and problems in design. Lectures and projects. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 4430.

**ECE 7470. Sustainable Electrical Energy Resources. 3 Credits.**

Analysis of renewable electrical energy resources from both the utility and distributed resource perspective. Covers safety, metering and power quality issues associated with coupling distributed resources to the utility grid. Prerequisites: Electrical and Computer Engineering [ECE] 3470 or Engineering [ENGINR] 2100.

**ECE 7510. Pulsed Power Engineering. 3 Credits.**

Concepts of energy generation and storage systems used in pulse power engineering, high power opening and closing switches, high voltage engineering, grounding and shielding, high voltage safety. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 3510.

**ECE 7530. Photonics. 3 Credits.**

Introduction to the physical principles and optical materials used in diagnostics, optical communications, semiconductor and solid state lasers, optical fiber transmissions, optical detectors, optical signal processing. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 3510.

**ECE 7550. Introduction to Plasmas. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 7375). Equations of plasma physics, interaction of waves and plasmas; plasma sheaths and oscillations; measurements and applications. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 4930.

**ECE 7570. Lasers and Their Applications. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 7382). An introductory course in lasers. The course treats the subject from both a conceptual viewpoint and from the application of Maxwell's equations, to develop the optical theory for lasers. The course includes approximately 10 classroom hours of laboratory work with lasers. Prerequisites: graduate standing and Physics [PHYSICS] 2760 and Mathematics [MATH] 4110.

**ECE 7580. Computational Neuroscience. 4 Credits.**

(Same as Biological Sciences [BIO\_SC] 7580 and Biological Engineering [BIOL\_EN] 7575). Interdisciplinary course in biology and quantitative sciences with laboratory and modeling components. Explores basic computational and neurobiological concepts at the cellular and network level. Introduction to neuronal processing and experimental methods in neurobiology; modeling of neurons and neuron-networks. Prerequisites: Mathematics [MATH] 1500 or equivalent. Graded on A/F basis only.

**ECE 7610. Physical Electronics. 3 Credits.**

Introduction to physical principles of semiconductors and semiconductor devices; gas, solid state, and semiconductor lasers; electro-optics; plasma physics and gaseous electronics; materials interaction with electric and magnetic fields. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 3510.

**ECE 7620. Introduction to BioMEMS. 3 Credits.**

BioMEMS materials, fabrication techniques, micro-fluidic principles and devices, drug delivery, biomedical micro-devices for neural implants, patch clamping and single cell based systems, micro-electroporation, DNA microarrays, Polymerase Chain Reaction, chemical/gas/bio-sensors. Graded on A/F basis only.

**ECE 7630. Introduction to Optical Electronics. 3 Credits.**

Principles, devices and materials used to generate, modulate, and detect optical radiation. Review of important properties of light and semiconductors. Light-emitting diodes and lasers. Electro-optic modulation. Thermal and quantum detection. Emphasis on semiconductor-based devices and application to fiber-optical communications. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 3610.

**ECE 7640. MEMS Laboratory. 4 Credits.**

The main objective of this course is to provide hands-on skills for the interdisciplinary Microelectromechanical systems (MEMS). It puts emphasis on the practical aspects of design, fabrication, test, and characterization of micro/nano devices and systems. Prerequisites: Physics [PHYSICS] 2760, Chemistry [CHEM] 1320 or Electrical and Computer Engineering [ECE] 2100; instructor's consent. Graded on A/F basis only.

**ECE 7650. Semiconductor Device Theory. 3 Credits.**

Band theory, equilibrium and non-equilibrium semiconductor electronics, junction theory, p-n junction devices, bipolar and field effect transistors including SPICE simulation. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 3610.

**ECE 7655. Digital Image Processing. 3 Credits.**

(same as Computer Science [CMP\_SC] 7650). The course provides fundamentals of digital image processing hardware and software including digital image acquisition, image display, image enhancement, image transforms and segmentation. Prerequisites: Statistics [STAT] 4710 and Computer Science [CMP\_SC] 2050 or instructor's consent.

**ECE 7670. Microelectronic Fabrication. 4 Credits.**

Basic silicon integrated circuit fabrication processes, basic techniques of wafer processing, economics of fabrication and resulting devices properties, interdependence of process flow and device design. Accompanying laboratory. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 3610.

**ECE 7675. Digital Image Compression. 3 Credits.**

(same as Computer Science [CMP\_SC] 7670) This course provides basic concepts and theorems in information theory, discrete cosine transform, discrete wavelet transform, quantizer design, bit allocation, and rate-distortion analysis and practical coding and communication system design, (such as Huffman coding, arithmetic coding, variable length coding, motion estimation, JPEG.) Prerequisite: Statistics [STAT] 4710 or instructor's consent. Graded on A/F basis only.

**ECE 7690. Design and Simulation of VLSI Circuits. 4 Credits.**

Design of CMOS integrated circuits with emphasis on analog applications. Device models are developed for circuit simulation. Lecture and laboratory. Prerequisite: graduate standing and Electrical and Computer Engineering [ECE] 4670.

**ECE 7710. Communications Systems. 3 Credits.**

Concepts of communication systems, signal analysis and power spectrum density, signal transmission and filtering, linear modulation, exponential modulation, sampling, baseband digital communication,

modulated digital communication, spread spectrum communication. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3830.

**ECE 7720. Introduction to Machine Learning and Pattern Recognition. 3 Credits.**

(same as Computer Science [CMP\_SC] 7720). This course provides foundation knowledge to the basic methods in machine learning and pattern recognition (MLPR). MLPR addresses the problem of programming computers to optimize certain performance criteria by using example data or expert knowledge and it has wide applications. Prerequisites: Computer Science [CMP\_SC] 2050 and Statistics [STAT] 4710 or instructor's consent.

**ECE 7730. Introduction to Wireless Communication System. 3 Credits.**

Principles of wireless communication analysis and design. Digital communication basics, cellular radio, wireless PCS communications, multiple access techniques, channel coding and equalization, and standards of digital cellular/PCS systems.

**ECE 7770. Electromechanical Conversion I. 3 Credits.**

Theory and applications of electric machinery. Steady state and transient performance analysis of AC and DC electrical machines with emphasis on internal electromagnetic phenomena. Fundamentals of electronic speed controls. Prerequisite: Electrical and Computer Engineering [ECE] 3470.

**ECE 7810. Multimedia Engineering and Technology. 4 Credits.**

(same as Computer Science [CMP\_SC] 7810). Survey of multimedia applications. Capture, coding, storage, transmission, and software tools for developing productions involving text, graphics, images, animation, sound and video. Term projects. Lecture and laboratory. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3210 and 3830.

**ECE 7830. Introduction to Digital Signal Processing. 4 Credits.**

Concepts, analytical tools, design techniques used in computer processing of signals; signal representation, sampling, discrete-time systems analysis, recursive and non-recursive filters, design/implementation, discrete Fourier transform. Prerequisites: graduate standing.

**ECE 7850. Digital Image Processing. 3 Credits.**

(same as Computer Science [CMP\_SC] 7650). Fundamentals of digital image processing hardware and software including digital image acquisition, image display, image enhancement, image transforms and segmentation. Prerequisites: graduate standing.

**ECE 7870. Introduction to Computational Intelligence. 3 Credits.**

(same as Computer Science [CMP\_SC] 7770). Introduction to the concepts, models, and algorithms for the development of intelligent systems from the standpoint of the computational paradigms of neural networks, fuzzy set theory and fuzzy logic, evolutionary computation and swarm optimization. Prerequisites: some exposure to rigorous axiomatic mathematical development of a topic (as can be found in most senior/graduate level math or statistics courses) is needed to appreciate some of the development of the theory. Also, the ability to program (well) in some high level language is essential to perform the computer projects. Graded on A/F basis only.

**ECE 7880. Micro/Nano Systems. 3 Credits.**

Micro/nano systems including micromachining, material properties, micro-actuators, optical, RF, inertial/mechanical and acoustic M/NEMS and M/

Nanofluidic systems. Prerequisite: Electrical and Computer Engineering [ECE] 3610 or instructor's approval. Graded on A/F basis only.

**ECE 7910. Microwave Systems. 3 Credits.**

Theory and applications of transmission systems with emphasis on transmission lines at low and high frequencies. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3510.

**ECE 7920. Microwave Engineering. 3 Credits.**

Wave equation, plane wave propagation, transmission line theory, Smith Chart analysis, impedance transformers, waveguides modes, basic antenna theory, impedance matching and tuning, basic microstrip and stripline circuits. Prerequisite: graduate standing.

**ECE 7930. Intermediate Electromagnetics. 4 Credits.**

Course covers transmission lines, waveguides, microstrip electromagnetic circuits, and radiating systems Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 7940. Antenna Theory, Design and Laboratory. 4 Credits.**

Introduction to antenna theory, design and laboratory. Emphasis on engineering aspects of antenna systems, transmitting and receiving antenna parameters, and various wire antennas. Prerequisite: Electrical and Computer Engineering [ECE] 3510.

**ECE 7950. Microwave Principles. 4 Credits.**

Maxwell's Equations, transmission lines, plane wave propagation and reflection, waveguides, resonant cavities, microwave devices and components, radiation, radio wave propagation. Lecture and laboratory. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 3510 and 3410.

**ECE 8001. Advanced Topics in Electrical and Computer Engineering. 3 Credits.**

Advanced Topics in Electrical and Computer Engineering.

**ECE 8010. Supervised Study in Electrical Engineering. 1-3 Credit.**

Supervised individual study at the graduate level to be completed within the course of one semester in the form of a brief report. Graded on S/U basis only.

**ECE 8020. Superconductivity and its Applications. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 8450). Phenomenology and theory of superconductivity, cryogenic practice, metallurgy of superconducting elements, alloys and compounds. Present and prospective applications.

**ECE 8085. Problems in Electrical and Computer Engineering. 2-5 Credit.**

Supervised investigation of an electrical engineering problem for an MS project. Study culminates in a project report. Graded on a S/U basis only.

**ECE 8110. Preparing Engineering Faculty and Professionals I. 1 Credit.**

Discussions on a variety of topics: Pedagogy - latest from cognitive science and learning theory, effective teaching, how a university functions, engineering teaching and research; how leading industries perform research and the importance of soft skills, etc. Graded on A/F basis only. Prerequisite: graduate standing in Engineering.

**ECE 8120. Preparing Engineering Faculty and Professionals II. 1 Credit.**

Continues format of Electrical and Computer Engineering [ECE] 8110 with group discussions and seminars by experts on how to write an effective proposal, including a review of model proposals, model proposal reviews, and a 'hands-on' proposal writing followed by globalization and

its effects on professionals. Graded on A/F only. Prerequisite: graduate standing in Engineering.

**ECE 8250. Digital Hardware Systems Design. 3 Credits.**

(same as Computer Engineering and Computer Science [CMP\_SC] 8250). Characteristics and parameters of various hardware subsystems including main memory, auxiliary memory, arithmetic units, card equipment, etc., and principles of organization into efficient system. Prerequisite: Electrical and Computer Engineering [ECE] 4250.

**ECE 8260. Computer Networks. 3 Credits.**

Concepts and goals of computer networking, structure of computer networks, OSI model and layers, network control, analysis, design, and management, data communication techniques including fiber optics, WAN, MAN and LAN architectures and protocols, inter-networking, case studies, and hands-on studying the performance by analytic modeling and computer simulation. Prerequisite: Computer Science [CMP\_SC] 4270.

**ECE 8270. Parallel Computer Architecture. 3 Credits.**

The course covers parallel computer architecture (general purpose multi-core and many-core processors, shared and distributed memory systems, clusters). Emphasis will be given to both architectural and programmability aspects. Prerequisite: Electrical and Computer Engineering [ECE] 4270/7270, 4220/7220 or Computer Science [CMP\_SC] 4250/7250. Graded on A/F basis only.

**ECE 8320. Nonlinear Systems. 3 Credits.**

Nonlinear systems including topics such as limit cycles, phase plane analysis, bifurcation, Lyapunov stability, input-output stability, passivity. Topics from control such as feedback linearization, sliding control, and Lyapunov redesign. Prerequisite: Electrical and Computer Engineering [ECE] 4310. Graded on A/F basis only.

**ECE 8330. Neural Networks for Learning Control. 3 Credits.**

Neurocomputing techniques and structures for modeling, learning control, control stabilization, and optimization of performance over time. Prerequisites: at least on 4000, 7000 or 8000- level control course.

**ECE 8340. Multivariable Control System Design. 3 Credits.**

This course will cover techniques in multivariable control system design and analysis, including LOG H-2 design, H-oo design, LTR, robust performance, and selected adaptive and learning control techniques for nonlinear control. Prerequisites: Electrical and Computer Engineering [ECE] 8310 or acceptable equivalent.

**ECE 8350. Optimal Control Theory. 3 Credits.**

Analysis and design of dynamic systems using optimal control theory: parameter optimization, dynamic optimization, computational methods, differential games. Prerequisite: Electrical and Computer Engineering [ECE] 8310.

**ECE 8360. Stochastic Optimal Estimation and Control. 3 Credits.**

Surveys random process theory; stochastic control and optimization; estimation and filtering based on Kalman-Bucy techniques; stochastic stability; adaptive and learning control systems. Prerequisites: Electrical and Computer Engineering [ECE] 8310.

**ECE 8370. Digital and Sample-Data Systems. 3 Credits.**

Introduces sampling and quantization, design of digital and sample-data systems, digital filters, adaptive sampling and quantization. Prerequisites: Electrical and Computer Engineering [ECE] 8310 and Statistics [STAT] 4710.

**ECE 8410. Power Electronics II. 3 Credits.**

Circuit concepts and analysis techniques for transistor switching regulators, thyristor choppers, transistor inverters, self-commutated thyristor inverters and cycloconverters. Prerequisite: Electrical and Computer Engineering [ECE] 4410.

**ECE 8420. Power Electronic Drives. 3 Credits.**

Advanced study of DC and AC motor drives controlled by power electronic methods, including phase controlled rectifier, DC chopper, cycloconverter, variable frequency inverters. Prerequisites: Electrical and Computer Engineering [ECE] 8410, 8310.

**ECE 8430. Digital Electronics. 3 Credits.**

Electronic hardware aspects of digital systems. Includes state-of-the-art information on integrated-circuit logic devices and their applications. Prerequisites: Electrical and Computer Engineering [ECE] 4690.

**ECE 8510. Advanced Electromagnetics. 3 Credits.**

Advanced theoretical electromagnetic theory. Investigation of summation problems with general boundary conditions, time varying fields, and time harmonic currents. Basic applications and relationships in classical and relativistic physics. Prerequisites: Electrical and Computer Engineering [ECE] 3510.

**ECE 8530. Advanced Photonics. 3 Credits.**

Concentrated study of optical system design, including integrated optics, semiconductor lasers, quantum wells, optical materials, and electro-optical effects used in modern optical systems. Prerequisites: Electrical and Computer Engineering [ECE] 4530.

**ECE 8570. Theoretical Neuroscience I. 3 Credits.**

Properties of nerve cells including membrane potential, action potential, ion channel dynamics, GHK equation, dynamical properties of excitable membranes. Equilibria, stability, eigenvalues and phase portraits. Conductance based models, bifurcations, excitability. Prerequisite: Electrical and Computer Engineering [ECE] 4310 and Graduate Standing. Graded on A/F basis only.

**ECE 8580. Theoretical Neuroscience II. 3 Credits.**

Neural encoding and decoding including firing rate and spike statistics, reverse correlation and visual receptive fields. Cellular and synaptic biophysics. Adaptation and learning including plasticity, classical conditioning, reinforcement learning and representational learning. Prerequisite: Electrical and Computer Engineering [ECE] 8570 and Graduate standing. Graded on A/F basis.

**ECE 8610. Power Semiconductor Devices. 3 Credits.**

A study of the semiconductor devices used in switch-mode power converter circuits. Course surveys the field and discusses selected devices in depth. Prerequisites: Electrical and Computer Engineering [ECE] 3610, 4630 and 4650.

**ECE 8620. Advanced Microelectromechanical Systems. 3 Credits.**

MEMS development cycle, overview of microfabrication, microsystem modeling, mechanical analysis, thermal analysis, transduction mechanism, case studies; Micromirror, accelerometers, pressure sensors, force sensors, RF MEMS switches, Infrared sensors, and Microsystem packaging.

**ECE 8630. Numerical Analysis of Semiconductor Devices. 3 Credits.**

Basic equations of semiconductor device analysis, associated boundary conditions, and physical models; discretization schemes and numerical solution methods; application to one and two dimensional bipolar and field effect device structures in thermal equilibrium and under DC steady

State and transient operating conditions. Prerequisites: Electrical and Computer Engineering [ECE] 4630 and 4650.

**ECE 8640. Advanced Integrated Circuits. 3 Credits.**

Fundamentals of advanced integrated circuit design; diffusion, ion implantation and epitaxy; MOS and bipolar techniques; survey of current LSI design, fabrication and testing.

**ECE 8650. Solid State Theory I. 3 Credits.**

Principles of quantum and wave mechanics as applied to solid state; Boltzman and Fermi statistics; energy band theory of crystals; electrons, holes in semiconductors. Current flow in P-N junctions, semiconductor devices.

**ECE 8660. Solid State Theory II. 3 Credits.**

Fundamentals of crystallography; application of X-ray analysis to the study of crystallinity. Quantum mechanical solution for the wave function of an electron in a solid; concepts of reciprocal space. Prerequisites: Electrical and Computer Engineering [ECE] 8650 or Physics [PHYSICS] 8150.

**ECE 8680. Quantum Electronics. 3 Credits.**

Optical pumping of metastable quantum states, magnetic state inversion. Semiconductor junction electron injection. Optical cavities, induced emission and optical regeneration. Parametric amplification. Prerequisite: Physics [PHYSICS] 3150.

**ECE 8690. Computer Vision. 3 Credits.**

(same as Computer Science [CMP\_SC] 8690). This course introduces students to the fundamental problems of computer vision, the main concepts and the techniques used to solve such problems. It will enable graduate and advanced undergraduate students to solve complex problems and make sense of the literature in the area. Prerequisite: Electrical and Computer Engineering [ECE] 4655/7655 or Computer Science [CMP\_SC] 4650/7650 or instructor's consent. Graded on A/F basis only.

**ECE 8695. Cognitive Computer Vision. 3 Credits.**

One of the more recent trends in computer vision research in the pursuit of human-like capability is the coupling of cognition and vision into cognitive computer vision. This course will emphasize the advanced topics in applying machine learning techniques in computer vision. Prerequisite: Electrical and Computer Engineering [ECE] 4850/7850 or Computer Science [CMP\_SC] 4650/7650 or consent of instructor. Graduate standing required.

**ECE 8710. Advanced Communications Systems. 3 Credits.**

Advanced topics on the performance of communication systems, including probability and random processes, signal space representation, optimal receivers, matched filtering, coherent detection of signals in noise, probability of error, and bit error rate. Prerequisites: Electrical and Computer Engineering [ECE] 4830 and 4710.

**ECE 8720. Microwave and RF Design of Wireless Systems. 3 Credits.**

Introduces fundamentals of Microwave/RF design and analysis of modern wireless systems. Topics include the following: wireless system components, receiver design, performance issues, noise, distortion, measurement techniques and computer-aided design techniques. Prerequisite: graduate standing.

**ECE 8725. Supervised Learning. 3 Credits.**

(same as Computer Science [CMP\_SC] 8725). This course introduces the theories and applications of advanced supervised machine learning methods. It covers hidden Markov model and expectation maximization (EM) algorithms, probabilistic graphical models, non-linear support



vector machine and kernel methods. The course emphasizes both the theoretical underpinnings of the advanced supervised learning methods and their applications in the real world. Prerequisites: Computer Science [CMP\_SC] /Electrical and Computer Engineering [ECE] 4720/7720 graduate standing or instructor's consent. Graded on A/F basis only.

**ECE 8730. Fundamentals of Radar Signal Processing. 3 Credits.**

Study of radar signal processing fundamentals. Topics include radar systems, signal models, sampling and quantization of radar signals, radar waveforms, Doppler processing, detection fundamentals, radar imaging. Prerequisite: graduate standing.

**ECE 8735. Unsupervised Learning. 3 Credits.**

(same as Computer Science [CMP\_SC] 8735). Theoretical and practical aspects of unsupervised learning including topics of expectation maximization (EM), mixture decomposition, clustering algorithms, cluster visualization, and cluster validity. Prerequisite: Computer Science [CMP\_SC] /Electrical and Computer Engineering [ECE] 4720/7720 or consent of instructor. Graded on A/F basis only.

**ECE 8740. Digital Signal Processing in Remote Sensing. 3 Credits.**

Study of digital signal processing in remote sensing applications. Investigation of digital signal processing methods for visible, near infrared, thermal infrared, and microwave wavelength sensors. Prerequisite: graduate standing.

**ECE 8750. Digital Signal Processing in Telecommunications. 3 Credits.**

Applications of digital signal processing in telecommunication systems; oversampling and quantizations, Delta-Sigma modulation, linear predictive speech coding, adaptive filtering, echo canceller, adaptive receivers and equalizers for wireless communication, digital cellular, CDMA. Prerequisites: Electrical and Computer Engineering [ECE] 4830 and 4710.

**ECE 8770. Advanced Mobile Communication Systems. 3 Credits.**

Channel estimation and equalization, multi-user detection, diversity combining, multi-carrier and OFDM, Standards of 3G Wireless Communication Systems such as EDGE, CDMA 2000 and UMTS.

**ECE 8780. State Variable Methods in Automatic Control. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 8780, Mechanical and Aerospace Engineering [MAE] 8780, Nuclear Engineering [NU\_ENG] 8408). State variables for continuous and discrete-time dynamic control systems; controllability and observability; optimal control of linear systems. Prerequisites: Chemical Engineering [CH\_ENG] 4370, Electrical and Computer Engineering [ECE] 4310, Mechanical and Aerospace Engineering [MAE] 4703 or instructor's consent.

**ECE 8790. Digital Processing of SAR Data. 3 Credits.**

Study of digital processing of synthetic aperture radar (SAR) data. Topics cover SAR data fundamentals including concepts, signal processing, pulse compression, signal properties, processing algorithms, and image processing. Prerequisites: graduate standing.

**ECE 8810. Advanced Digital Signal Processing. 3 Credits.**

Topics in digital signal analysis and filtering. Including hardware implementation, speech synthesis and recognition, multi-dimensional transforms, random-signal concepts, design methods and computer aids to analysis and design. Prerequisite: Electrical and Computer Engineering [ECE] 4830.

**ECE 8820. Pattern Recognition. 3 Credits.**

(same as Computer Science [CMP\_SC] 8760). Decision functions, crisp and fuzzy clustering methods, statistical pattern recognition

methods, Bayesian classifiers, error probabilities, estimation of density functions, perceptrons, least-mean-square algorithms, feature selection, dimensionality reduction and syntactic pattern recognition. Prerequisites: Computer Science [CMP\_SC] 4050, Statistics [STAT] 4710.

**ECE 8830. Visual Signal Processing and Communications. 3 Credits.**

Threats visual digital signal processing and network communications covering both theory and application of coding, compression and communications via the web. Covers such standards as JPEG, MPEG-2 and MPEG-4 as well as motion detection. Graded on A/F basis only. Graduate standing required.

**ECE 8840. Artificial Intelligence. 3 Credits.**

Concepts, theories, and models pertaining to neural nets, pattern recognition, learning systems, and programmed problem solving.

**ECE 8850. Digital Image Processing. 3 Credits.**

Image processing methods for segmentation, object representation, scene description and scene interpretation. Prerequisites: Electrical and Computer Engineering [ECE] 4850.

**ECE 8855. Advanced Image Processing. 3 Credits.**

(same as Computer Science [CMP\_SC] 8650). This course covers advanced topics in image understanding including multispectral multimodal imaging, motion estimation, texture analysis, geometric level set methods. Prerequisites: CMP\_SC 4650/7650 or instructor's consent. Graduate Standing Required.

**ECE 8860. Probability and Stochastic Processes for Engineers. 3 Credits.**

Introduction to probability, multidimensional complex (phasor) random variables and stochastic processes in electrical engineering. Prerequisites: Electrical and Computer Engineering [ECE] 4830, 4710, or 8620.

**ECE 8870. Modeling and Management of Uncertainty. 3 Credits.**

(same as Computer Science [CMP\_SC] 8870). Theoretical and practical issues in the modeling and management of uncertainty. Topics include probabilistic uncertainty, belief theory and fuzzy set theory. Applications to computer vision, pattern recognition and expert systems. Prerequisites: Electrical and Computer Engineering [ECE] 4870/7870 or instructor's consent. Graded on A/F basis only.

**ECE 8880. System Modeling. 3 Credits.**

System performance requires the assessment of its delay and throughput. Markov theory provides the theoretical basis for such assessment. More general methods describe queues including open and closed queuing networks. Includes performance assessment of computer processors. Prerequisite: Statistics [STAT] 4710.

**ECE 8890. Neural Networks. 3 Credits.**

(same as Computer Science [CMP\_SC] 8770). The course will consider computing systems based on neural networks and learning models along with implementations and applications of such systems. Prerequisites: Electrical and Computer Engineering [ECE] 4870/7870 or instructor's consent.

**ECE 8910. High Frequency Transmission and Radiation. 3 Credits.**

Skin effect; theory of transmission lines, wave guides, resonators.

**ECE 8920. Antennas. 3 Credits.**

Point and aperture sources; simple antennas; antenna array; data-processing antennas; and other broadband and directive antennas.

**ECE 8990. Research-Master Thesis in Electrical and Computer Engineering. 1-99 Credit.**

Independent investigation in a field of electrical engineering to be presented as thesis or dissertation. Graded on a S/U basis only.

**ECE 9001. Advanced Topics in Electrical and Computer Engineering. 3 Credits.**

Advanced Topics in Electrical and Computer Engineering.

**ECE 9990. Research-Doctoral Dissertation Electrical & Computer Engineering. 1-99 Credit.**

Independent investigation in a field of electrical engineering to be presented as thesis or dissertation. Graded on a S/U basis only.

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## Emergency Medicine (EMR\_ME)

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**EMR\_ME 6243. ABS Emergency Medicine Research. 5-10 Credit.**  
ABS Emergency Medicine Research.

**EMR\_ME 6245. ABS Emergency Medicine Research and Review. 5-10 Credit.**

ABS Emergency Medicine Research and Review.

**EMR\_ME 6460. Emergency Medicine. 5 Credits.**  
Emergency Medicine.

**EMR\_ME 6760. Emergency Medicine - Rural. 5 Credits.**  
Emergency Medicine - Rural.

**EMR\_ME 6860. EMERGENCY MEDICINE. 5 Credits.**  
Emergency Medicine.

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## Engineering (ENGINR)

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**ENGINR 1000. Introduction to Engineering. 0-2 Credit.**

This course will introduce the students to university life, discuss learning strategies for success and give an overview of the engineering profession and each of the main engineering disciplines.

**ENGINR 1001. Experimental Course. 3-99 Credit.**

For freshman-level students. Content and number of credit of hours to be listed in Schedule of Courses.

**ENGINR 1100. Engineering Graphics Fundamentals. 2 Credits.**

Introduction to computer-aided design and drafting. Topics include visualization methods and standards techniques for communication and presenting engineering design graphics information. Restricted to Engineering Students Only, or by departmental consent.

**ENGINR 1110. Solid Modeling for Engineering Design. 1 Credit.**

Introduction to 3D (three dimensional) modeling techniques using computer aided design software. Topics include model creation techniques and advanced graphical presentation practices. Prerequisite: Engineering [ENGINR] 1100 and instructor's consent. Restricted to Engineering Students Only or by departmental consent. Graded on A/F basis only.

**ENGINR 1200. Statics and Elementary Strength of Materials. 3 Credits.**

Fundamentals of statics; static equilibrium and introduction to elements of mechanics of elastic materials. Prerequisites: Mathematics [MATH] 1500 and Physics [PHYSICS] 2750 concurrently. Restricted to Engineering Students only or with departmental consent.

**ENGINR 2001. Experimental Course. 1-99 Credit.**

For sophomore-level students. Content and number of credit hours to be listed in Schedule of Courses.

**ENGINR 2100. Circuit Theory for Engineers. 3 Credits.**

DC circuit analysis, inductors and capacitors, first-order response, AC circuit analysis, single-phase AC power and three-phase, transformers. Co-Requisite: Mathematics [MATH] 2300. For Non-Electrical and Computer Engineering [ECE] Majors. Restricted to Engineering Students only or with Departmental Consent.

**ENGINR 2100H. Circuit Theory for Engineers - Honors. 3 Credits.**

DC circuit analysis, inductors and capacitors, first order response, AC circuit analysis, single-phase AC power. Prerequisite: Mathematics [MATH] 1700. Honors eligibility required.

**ENGINR 2200. Intermediate Strength of Materials. 3 Credits.**

Elements of mechanics of elastic materials. Prerequisite: Engineering [ENGINR] 1200. Restricted to Engineering Students only or with departmental consent.

**ENGINR 2300. Engineering Thermodynamics. 3 Credits.**

(same as Mechanical and Aerospace Engineering [MAE] 2300). Fluid properties, work and heat, first law, second law, entropy, applications to vapor and ideal gas processes. Prerequisites: Physics [PHYSICS] 2750. Restricted to Engineering Students Only or departmental consent.

**ENGINR 2500. A History of Modern Engineering. 3 Credits.**

This course will introduce the student to significant engineering events that have shaped the late modern-area from the French Revolution to the end of World War II (1789-1945). Radical inventions and their dates will be used as historical landmarks throughout the course. Graded on A/F basis only.

**ENGINR 2500H. A History of Modern Engineering - Honors. 3 Credits.**

This course will introduce the student to significant engineering events that have shaped the late modern-area from the French Revolution to the end of the World War II (1789-1945). Radical inventions and their dates will be used as historical landmarks throughout the course. Honors eligibility required. Graded on A/F basis only.

**ENGINR 2600H. History of Human Spaceflight - Honors. 3 Credits.**

This course will provide an overview of the history of human spaceflight, including early efforts up through the present for the three countries that have flown humans in space (U.S., Russian, and China). Special topics will include a discussion of the major space accidents. Finally, the future of human space exploration will be discussed. May be repeated for credit. Graded on A/F basis only. Honors eligibility required.

**ENGINR 3000. Short Term Education Abroad. 3 Credits.**

Introduction to history and culture of country and/or cities in specified country. Students will make engineering profession and corporate site visits. Lecture activities will focus on industry and society, with country and/or cities compared and contrasted to U.S. engineering. Instructor's consent required. Students must be in Academic Good Standing. Graded A-F only.

**ENGINR 3000H. Short Term Education Abroad - Honors. 3 Credits.**

Introduction to history and culture of country and/or cities in specified country. Students will make engineering profession and corporate site visits. Lecture activities will focus on industry and society, with country and/or cities compared and contrasted to U.S. engineering. Graded A-F only. Prerequisite: Instructor's consent required. Students must be in Academic Good Standing.

**ENGINR 4000. Study Abroad Technical Elective. 3-6 Credit.**

This course is designed to provide students with an international experience while also potentially fulfilling a required engineering technical elective course. Engineering technical electives are courses that are relevant or related to engineering from a broad range of fields including math and science as well as the various engineering departments. This course will be used as the umbrella course for all Engineering Technical Elective Study Abroad Opportunities and each course will provide a separate section number.

**ENGINR 4085. Problems in Engineering. 0-6 Credit.**

Special design, experimental or analytical problems in engineering. May be repeated to 6 hours.

**ENGINR 4890. Multi-disciplinary Senior Engineering Capstone Design. 3 Credits.**

Engineering design and prototyping including reliability, testing, evaluation, preparation of documentation, safety, ethics, manufacturing, intellectual property, economic and environmental constraints. Oral and written reports. Prerequisites: Senior Standing and Instructor consent. Student's department consent also required. Graded A-F only.

**ENGINR 8100. Design and Development of Biomedical Innovations. 3 Credits.**

This course takes students through the process of brainstorming and working out a solution to a medical need, and then producing a product. Outputs may include the development of a physical prototype through interactions with the College of Engineering rapid prototype facility. May be repeated for credit. Graded on A-F basis only. Prerequisite: Must be enrolled in a graduate degree program.

## English (ENGLISH)

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**ENGLISH 1000. Exposition and Argumentation. 3 Credits.**

Stresses writing as a process, with due attention given to critical reading and thinking skills applicable to all college classes, as well as to invention, drafting, revising, and rewriting. English [ENGLISH] 1000 is a prerequisite for any Writing Intensive course.

**ENGLISH 1000H. Honors Exposition English. 3 Credits.**

Stresses writing as a process, with due attention given to critical reading and thinking skills applicable to all college classes, as well as to invention, drafting, revising, and rewriting. English [ENGLISH] 1000 is a prerequisite for any Writing Intensive course. Honors eligibility required.

**ENGLISH 1060. Human Language. 3 Credits.**

(same as Anthropology [ANTHRO] 1060, Communication Science and Disorders [C\_S\_D] 1060 and Linguistics [LINGST] 1060). General introduction of various aspects of linguistic study. Elementary analysis of language data, with some attention to application of linguistic study to other disciplines.

**ENGLISH 1100. Reading Literature. 3 Credits.**

Introduces the student to the values, rigors, and pleasures of reading literature. Intended for first-year, non-English majors. No more than six hours may be taken in the Reading Literature Series.

**ENGLISH 1106. Reading Literature, Beginnings to 1603. 3 Credits.**

See English [ENGLISH] 1100 course for description.

**ENGLISH 1107. Reading Literature, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 1100 course for description.

**ENGLISH 1108. Reading Literature, 1789-1890. 3 Credits.**

See English [ENGLISH] 1100 course for description.

**ENGLISH 1109. Reading Literature, 1890 to Present. 3 Credits.**

See English 1100 course for description.

**ENGLISH 1160. Themes in Literature. 3 Credits.**

Topics (e.g., The Idea of Progress, Images of Women) announced at time of registration. No more than six hours may be taken in the Themes in Literature series.

**ENGLISH 1166. Themes in Literature, Beginnings to 1603. 3 Credits.**

See English [ENGLISH] 1160 for course description.

**ENGLISH 1167. Themes in Literature, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 1160 for course description.

**ENGLISH 1168. Themes in Literature, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 1160 for course description.

**ENGLISH 1169. Themes in Literature, 1890 to Present. 3 Credits.**

See English 1160 for course description.

**ENGLISH 1200. Readings in British Literature. 3 Credits.**

Focuses on reading and interpreting selected texts in British literature. No more than six hours may be taken in Readings in British Literature Series.

**ENGLISH 1206. Readings in British Literature, Beginning to 1603. 3 Credits.**

See English [ENGLISH] 1200 for course description.

**ENGLISH 1207. Readings in British Literature, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 1200 for course description.

**ENGLISH 1208. Readings in British Literature, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 1200 for course description.

**ENGLISH 1209. Readings in British Literature, 1890 to Present. 3 Credits.**

See English 1200 for course description.

**ENGLISH 1210. Introduction to British Literature. 3 Credits.**

A basic introduction to the concepts, terms, and practices commonly encountered in literary study, presented by way of texts from the history of British literature that appropriately demonstrate such concepts, terms, and practices. This course is recommended for prospective majors. Graded on A/F basis only.

**ENGLISH 1300. Readings in American Literature. 3 Credits.**

Focuses on reading and interpreting selected texts in American literature. No more than six hours may be taken in the Readings in American Literature series.

**ENGLISH 1307. Readings in American Literature, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 1300 for course description.

**ENGLISH 1308. Readings in American Literature, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 1300 for course description.

**ENGLISH 1309. Readings in American Literature, 1890 to Present. 3 Credits.**

See English 1300 for course description.

**ENGLISH 1310. Introduction to American Literature. 3 Credits.**

A basic introduction to the concepts, terms, and practices commonly encountered in literary study, presented by way of texts from the history of American literature that appropriately demonstrate such concepts, terms, and practices. This course is recommended for prospective English Majors. Graded on A/F basis only.

**ENGLISH 1310H. Introduction to American Literature - Honors. 3 Credits.**

A basic introduction to the concepts, terms, and practices commonly encountered in literary study, presented by way of texts from the history of American literature that appropriately demonstrates such concepts, terms, and practices. Honors eligibility required. Graded A-F only.

**ENGLISH 1510. Creative Writing: Introduction to Fiction. 3 Credits.**

Introduces basic narrative techniques, including writing original stories.

**ENGLISH 1520. Creative Writing: Introduction to Nonfiction Prose. 3 Credits.**

Introduces the range and basic techniques of creative nonfiction, including composing original work in the genre.

**ENGLISH 1530. Creative Writing: Introduction to Poetry. 3 Credits.**

Introduces basic poetic techniques, including writing original poems.

**ENGLISH 1700. Introduction to Folklore Genres. 3 Credits.**

(same as Anthropology [ANTHRO] 1150). Course focus is on genres of folklore in both historic and contemporary contexts, as well as in people's daily lives. Genres include narrative, proverbs, oral poetry and rhyme, riddles, jokes, legends, epics, material culture and intangible expressive culture. Graded on A/F basis only.

**ENGLISH 1800. Introduction to Film Studies. 3 Credits.**

(same as Film Studies [FILM\_S] 1800). Introduction to terms and concepts for film analysis, including mise-en-scene, cinematography, editing, sound narrative, genre, and other elements. Prerequisites: freshman and sophomores only or instructor's consent. No credit for students who have completed Film Studies [FILM\_S] 2810. Graded on A/F basis only.

**ENGLISH 2000. Studies in English. 1-3 Credit.**

Underclass topics. Subjects vary from semester to semester. No more than six hours may be taken in the Topics in English Studies series.

**ENGLISH 2000H. Studies in English - Honors. 1-3 Credit.**

Underclass topics. Subjects vary from semester to semester. No more than six hours may be taken in the Topics in English Studies series. Honors eligibility required.

**ENGLISH 2005. Topics in English - Humanities. 3 Credits.**

Underclass topics. Subjects vary from semester to semester. May be repeated to 6 hours maximum.

**ENGLISH 2006. Studies in English, Beginning to 1603. 1-3 Credit.**

See English [ENGLISH] 2000 for course description.

**ENGLISH 2007. Studies in English, 1603 to 1789. 1-3 Credit.**

See English [ENGLISH] 2000 for course description.

**ENGLISH 2008. Studies in English, 1789 to 1890. 1-3 Credit.**

See English [ENGLISH] 2000 for course description.

**ENGLISH 2009. Studies in English, 1890 to Present. 1-3 Credit.**

See English [ENGLISH] 2000 for course description.

**ENGLISH 2010. Intermediate Composition. 3 Credits.**

Provides intensive guided practice in expository and persuasive writing. Prerequisite: English [ENGLISH] 1000 or equivalent.

**ENGLISH 2015H. Theory and Practice of Tutoring Writing Seminar - Honors. 3 Credits.**

(same as General Honors [GN\_HON] 2015H). Addresses both the theory and practice of tutoring and the foundations of good writing. This course also qualifies students for a part-time job working as Writing Lab/Online Writery tutors in future semester. Honors eligibility required. Prerequisites: English [ENGLISH] 1000; instructor's consent.

**ENGLISH 2030. Professional Writing. 3 Credits.**

Introduction to the communication required in any professional field, including basic letters and resumes, reviews, reports, and electronic networking, culminating in an extensive report and a related oral presentation. Prerequisite: English [ENGLISH] 1000.

**ENGLISH 2100. Writing About Literature. 3 Credits.**

Introduces the student to reading in three or four genres (fiction, poetry, drama, and non-fiction) and to literary concepts and terms and their application in literary analysis. Prerequisite: English [ENGLISH] 1000.

**ENGLISH 2100H. Writing About Literature - Honors. 3 Credits.**

Introduces the student to reading in three or four genres (fiction, poetry, drama, and non-fiction) and to literary concepts and terms and their application in literary analysis. Prerequisite: English [ENGLISH] 1000. Honors eligibility required.

**ENGLISH 2140. Twentieth-Century Literature. 3 Credits.**

A multi-genre survey emphasizing American and British works within the intellectual and cultural context of our time. Prerequisite: English [ENGLISH] 1000.

**ENGLISH 2150. Popular Literature. 3 Credits.**

Study of literary genres, such as science fiction and the detective novel, that may be overlooked in traditional literature classes. Prerequisite: English [ENGLISH] 1000.

**ENGLISH 2155. Introduction to World Literatures. 3 Credits.**

Presents and puts into context works by writers from different nations or ethnic backgrounds; includes works in two or more literary genres. No more than six hours may be taken in the Introduction to World Literature series.

**ENGLISH 2156. Introduction to World Literatures, Beginnings to 1603. 3 Credits.**

See English [ENGLISH] 2155 for course description.

**ENGLISH 2157. Introduction to World Literatures, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 2155 for course description.

**ENGLISH 2158. Introduction to World Literatures, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 2155 for course description.

**ENGLISH 2159. Introduction to World Literatures, 1890 to Present. 3 Credits.**

Presents and puts into context works by writers from different nations or ethnic backgrounds, includes works in two or more literary genres. No more than six hours may be taken in the Introduction to World Literature series.

**ENGLISH 2160. Major Authors. 3 Credits.**

Focuses on the works of a single writer (e.g., Shakespeare) or set of writers (e.g., William Faulkner and Flannery O'Connor). Topic announced at time of registration. Prerequisite: English [ENGLISH] 1000. No more than six hours may be taken in the Major Authors series.

**ENGLISH 2166. Major Authors, Beginning to 1603. 3 Credits.**

See English [ENGLSH] 2160 for course description.

**ENGLISH 2167. Major Authors, 1603 TO 1789. 3 Credits.**

See English [ENGLSH] 2160 for course description.

**ENGLISH 2168. Major Authors, 1789 to 1890. 3 Credits.**

See English [ENGLSH] 2160 for course description.

**ENGLISH 2169. Major Authors, 1890 to Present. 3 Credits.**

See English [ENGLSH] 2160 for course description.

**ENGLISH 2180. Introduction to Women's Literature. 3 Credits.**

(same as Women's and Gender Studies [WGST] 2180). A study of traditional and nontraditional literature written by women from the perspective of feminist themes—love, power, work, family and other relations. Prerequisite: English [ENGLSH] 1000. No more than six hours may be taken in the Introduction to Women's Literature series.

**ENGLISH 2186. Introduction to Women's Literature, Beginning to 1603. 3 Credits.**

(same as Women's and Gender Studies [WGST] 2186). See English [ENGLSH] 2180 for course description.

**ENGLISH 2187. Introduction to Women's Literature, 1603 to 1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 2187). See English [ENGLSH] 2180 for course description.

**ENGLISH 2188. Introduction to Women's Literature, 1789 to 1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 2188). See English [ENGLSH] 2180 for course description.

**ENGLISH 2189. Introduction to Women's Literature, 1890 to Present. 3 Credits.**

(same as Women's and Gender Studies [WGST] 2189). See English [ENGLSH] 2180 for course description.

**ENGLISH 2200. Studies in British Literature. 3 Credits.**

Topic (e.g., Gothic Literature, The Domestic Novel) announced at time of registration. Prerequisite: English [ENGLSH] 1000. No more than six hours may be taken in the Topics in British Literature series.

**ENGLISH 2200H. Studies in British Literature - Honors. 3 Credits.**

Topic (e.g., Gothic Literature, The Domestic Novel) announced at time of registration. Prerequisite: English [ENGLSH] 1000. No more than six hours may be taken in the Topics in British Literature series. Honors eligibility required.

**ENGLISH 2206. Studies in British Literature, Beginning to 1603. 3 Credits.**

See English [ENGLSH] 2200 for course description.

**ENGLISH 2207. Studies in British Literature, 1603 to 1789. 3 Credits.**

See English [ENGLSH] 2200 for course description.

**ENGLISH 2208. Studies in British Literature, 1789 to 1890. 3 Credits.**

See English [ENGLSH] 2200 for course description.

**ENGLISH 2209. Studies in British Literature, 1890 to Present. 3 Credits.**

See English [ENGLSH] 2200 for course description.

**ENGLISH 2300. Studies in American Literature. 3 Credits.**

Topic (e.g., American Culture, The Frontier) announced at time of registration. Prerequisite: English [ENGLSH] 1000. No more than six hours may be taken in the Topics in American Literature series.

**ENGLISH 2306. Studies in American Literature, Beginning to 1603. 3 Credits.**

See English [ENGLSH] 2300 for course description.

**ENGLISH 2307. Studies in American Literature, 1603 to 1789. 3 Credits.**

See English [ENGLSH] 2300 for course description.

**ENGLISH 2308. Studies in American Literature, 1789-1890. 3 Credits.**

See English [ENGLSH] 2300 for course description.

**ENGLISH 2309. Studies in American Literature, 1890 to Present. 3 Credits.**

See English [ENGLSH] 2300 for course description.

**ENGLISH 2400. Introduction to African Diaspora Literature. 3 Credits.**

(same as Black Studies [BL\_STU] 2400). Introduces students to African Diaspora literature with an emphasis on literature written originally in English. Prerequisite: English [ENGLSH] 1000. No more than six hours may be taken in the Introduction to African Diaspora Literature series.

**ENGLISH 2407. Introduction to African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 2407). See English [ENGLSH] 2400 for course description.

**ENGLISH 2408. Introduction to African Diaspora Literature, 1789 to 1890. 3 Credits.**

(same as Black Studies [BL\_STU] 2408). See English [ENGLSH] 2400 for course description.

**ENGLISH 2409. Introduction to African Diaspora Literature, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] 2409). See English [ENGLSH] 2400 for course description.

**ENGLISH 2490. Introduction to Native Studies. 3 Credits.**

(Same as PEA\_ST 2490) Introduction to the field of Native Studies. Topics include indigenous knowledge, culture change and continuity, history and misrepresentation, politics and political history, and global indigenous relationships. Graded on A-F basis only.

**ENGLISH 2510. Creative Writing: Intermediate Fiction. 3 Credits.**

Provides intensive guided practice in the writing of short fiction. Prerequisite: English [ENGLSH] 1510 or equivalent.

**ENGLISH 2520. Creative Writing: Intermediate Nonfiction Prose. 3 Credits.**

Provides guided practice in the writing of creative nonfiction. Prerequisite: English [ENGLSH] 1520 or equivalent.

**ENGLISH 2530. Creative Writing: Intermediate Poetry. 3 Credits.**

Provides intensive guided practice in the writing of poetry. Prerequisite: English [ENGLSH] 1530 or equivalent.

**ENGLISH 2560. Beginning Playwriting. 3 Credits.**

(same as Theatre [THEATR] 2920). Study and practice of playwriting fundamentals; emphasizes the one-act play.

**ENGLISH 2700. Introduction to Folklore Field Research. 3 Credits.**

(same as Anthropology [ANTHRO] 2150). Course will focus on the specifics of how to identify, collect, preserve and document folklore within communities. Prerequisite: English [ENGLSH] 1000.

**ENGLISH 2770. Introduction to Oral Literature. 3 Credits.**

An introduction to works of verbal art from living oral tradition (e.g. Native American and African-American) and to some of our most important

literary works with roots in oral tradition (e.g., the Bible, the Iliad, and the Odyssey, and Beowulf). Prerequisite: ENGLSH 1000.

**ENGLSH 2830. American Film History I, 1895-1950. 3 Credits.**  
(same as Film Studies [FILM\_S] 2830). Examines the development of American cinema in relation to other national cinemas, from 1895-1950. No credit for students who have completed English [ENGLSH]/Film Studies [FILM\_S] 1810. Prerequisite: English [ENGLSH] 1000, English [ENGLSH]/Film Studies [FILM\_S] 1800.

**ENGLSH 2840. American Film History II, 1950-Present. 3 Credits.**  
(same as Film Studies [FILM\_S] 2840). Examines American film history in an international context, from 1950-present. No credit for students who have completed English [ENGLSH]/Film Studies [FILM\_S] 1820. Prerequisite: English [ENGLSH] 1000 and English [ENGLSH]/Film Studies [FILM\_S] 1800.

**ENGLSH 2860. Film Themes and Genres. 3 Credits.**  
(same as Film Studies [FILM\_S] 2860). Topics (e.g. Film noir, African-American filmmakers, Food and Film, The Western) announced at time of registration. No more than six hours may be taken in Film Themes and Genres 2680. Prerequisite: English [ENGLSH] 1000 and English [ENGLSH] / Film Studies [FILM\_S] 1800.

**ENGLSH 2870. Film and Literature. 3 Credits.**  
(same as Film Studies [FILM\_S] 2870). Explores the complex interplay between film and literature in order to gain an understanding of the possibilities - and problems - involved in the transposition from literature to film. Prerequisites: English [ENGLSH] 1000 and English [ENGLSH]/Film Studies [FILM\_S] 1800. Graded on A/F basis only.

**ENGLSH 2945. Service Learning in English. 1-3 Credit.**  
Students perform volunteer service and complete course requirements, which may include class meetings and written and oral assignments. May be repeated with departmental consent. Graded on a S/U basis only. Does not meet A&S general education requirements. Prerequisite: instructor's consent.

**ENGLSH 3010. Advanced Composition. 3 Credits.**  
An intensive writing workshop in which student essays and related texts receive close reading and analysis. Focus (e.g. The Essay, The Research Paper) announced at time of registration. Prerequisite: instructor's consent.

**ENGLSH 3080. Sexuality and Gender Theory. 3 Credits.**  
(same as Women's and Gender Studies [WGST] 3080). Examination of major theoretical approaches and debates in the study of gender and sexuality, with particular attention to the intersection of culture, representation, and identity. May be repeated to 6 hours with department consent. Prerequisite: sophomore standing.

**ENGLSH 3100. Introduction to Literary Theory. 3 Credits.**  
Introduction to the range of theoretical approaches to the study of literature; intended as a broad survey of literary theory, whether from the Classical era onward or 20th century literary theory and beyond. Prerequisite: English [ENGLSH] 1000 and sophomore standing.

**ENGLSH 3110. Special Themes in Literature. 1-3 Credit.**  
Topics (e.g., Postmodernism, Representations of Nature) announced at time of registration. Prerequisites: English [ENGLSH] 1000 or equivalent and sophomore standing. No more than six hours may be taken in the Special Themes in Literature series.

**ENGLSH 3110H. Special Themes in Literature - Honors. 1-3 Credit.**  
Topics (e.g., Postmodernism, Representations of Nature) announced at time of registration. No more than six hours may be taken in the Special

Themes in Literature series. Prerequisites: ENGLSH 1000 or equivalent and sophomore standing. Honors eligibility required.

**ENGLSH 3116. Special Themes in Literature, Beginning to 1603. 3 Credits.**  
See English [ENGLSH] 3110 for course descriptions.

**ENGLSH 3117. Special Themes in Literature, 1603 to 1789. 3 Credits.**  
See English [ENGLSH] 3110 for course descriptions.

**ENGLSH 3118. Special Themes in Literature, 1789 to 1890. 3 Credits.**  
See English [ENGLSH] 3110 for course descriptions.

**ENGLSH 3119. Special Themes in Literature, 1890 to Present. 3 Credits.**  
See English [ENGLSH] 3110 for course descriptions.

**ENGLSH 3170. World Dramatic Literature. 3 Credits.**  
(same as Theatre [THEATR] 3700). Survey of world drama from Greeks to present, focusing on structure, theory, and performance. Graded on A/F basis only. Prerequisite: sophomore standing.

**ENGLSH 3180. Survey of Women Writers. 3 Credits.**  
(same as Women's and Gender Studies [WGST] 3180). A study of writing by women from the Middle Ages to the present. Prerequisite: sophomore standing.

**ENGLSH 3180H. Survey of Women Writers - Honors. 3 Credits.**  
A study of writing by women from the Middle Ages to the present. Prerequisite: sophomore standing. Honors eligibility required.

**ENGLSH 3200. Survey of British Literature: Beginnings to 1784. 3 Credits.**  
Historical survey from beginnings of British literature through the age of Johnson, with readings representing significant writers, works and currents of thought. Prerequisite: English [ENGLSH] 1000 or equivalent.

**ENGLSH 3210. Survey of British Literature: Romanticism to the Present. 3 Credits.**  
Historical survey of British literature from the Romantic period to the present, emphasizing important writers and significant intellectual and cultural movements. Prerequisite: English [ENGLSH] 1000.

**ENGLSH 3300. Survey of American Literature: Beginnings to 1865. 3 Credits.**  
A survey of major writers and movements in American literature from Colonialism to Romanticism. Prerequisite: English [ENGLSH] 1000 or equivalent.

**ENGLSH 3310. Survey of American Literature: 1865-Present. 3 Credits.**  
A survey of major writers and movements in American literature from realism to postmodernism. Prerequisite: English [ENGLSH] 1000 or equivalent.

**ENGLSH 3400. Survey of African American Literature, Beginnings to 1900. 3 Credits.**  
(same as Black Studies [BL\_STU] 3400). A survey of major authors and movements in African American literature from its beginnings to 1900. Prerequisite: English [ENGLSH] 1000.

**ENGLSH 3410. Survey of African American Literature, 1900-Present. 3 Credits.**  
(same as Black Studies [BL\_STU] 3410). A survey of major authors and movements in African American literature from 1900 to the present. Prerequisite: English [ENGLSH] 1000.

**ENGLISH 3420. Periods and Genres in African Diaspora Literature. 3 Credits.**

(same as Black Studies [BL\_STU] 3420). Topic (e.g. Harlem Renaissance African Diaspora Poetry) Announced at time of registration. Prerequisite: English [ENGLISH] 1000. No more than six hours may be taken in the Periods and Genres in African Diaspora Literature series.

**ENGLISH 3427. Periods and Genres in African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 3427). See English [ENGLISH] 3420 for course description.

**ENGLISH 3428. Periods and Genres in African Diaspora Literature, 1789 to 1890. 3 Credits.**

(same as Black Studies [BL\_STU] 3428). See English [ENGLISH] 3420 for course description.

**ENGLISH 3429. Periods and Genres in African Diaspora Literature, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] 3429). See English [ENGLISH] 3420 for course description.

**ENGLISH 3430. Introduction to African Diaspora Literary Theory. 3 Credits.**

(same as BL\_STU 3705). Introduction to the range of theoretical approaches to the study of African Diaspora literature, with particular attention to the diverse socio-political contexts that undergird range of literary, historical, and cultural theories; intended as a broad survey of African Diaspora literary theory, whether from the Slavery era onward or 20th century literary theory and beyond. May be repeated for credit with consent. Prerequisite: ENGLISH 1000 and sophomore standing.

**ENGLISH 3490. Native Writing and Representation. 3 Credits.**

(same as PEA\_ST 3490). Survey of native writing and representation from the late eighteenth century to the present, encompassing a diverse range of tribes and forms. Material will be drawn from tribes inhabiting the North American continent, but global indigenous relationships will also be addressed. Graded on A-F basis only.

**ENGLISH 3560. Intermediate Playwriting. 3 Credits.**

(same as Theatre [THEATR] 3920). Intermediate study of the writing process as applied to theatre, leading to the creation of a full-length play to be considered for production. Prerequisite: English [ENGLISH] 2560.

**ENGLISH 3570. Performance of Literature. 3 Credits.**

(same as Communication [COMMUN] 3570 and Theatre [THEATR] 3200). Analysis and oral interpretation of literary works. Graded on A/F basis only. Prerequisite: sophomore standing.

**ENGLISH 3700. American Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 3150). Focus on regional and ethnic folklore; emphasis on analysis of folklore in context. Requirements include book reports and two analytical papers based on student field research.

**ENGLISH 3820. Major Directors. 3 Credits.**

(same as Film Studies [FILM\_S] and Romance Languages [RM\_LAN] 3820). Topics (e.g. Hitchcock, Kubrick, Fellini, Allen, Kurosawa, Wilder) announced at time of registration. Only 6 hours may be taken for credit toward major. Prerequisites: English [ENGLISH] 1000 and English [ENGLISH]/Film Studies [FILM\_S] 1800. Graded on A/F basis only.

**ENGLISH 3850. Studies in Film History. 3 Credits.**

(same as Film Studies [FILM\_S] 3850). Topics (e.g. Classical Period of Hollywood cinema, silent era, Post-WWII American film, German Weimar cinema, French New Wave) announced at time of registration. Only 6

hours count as credit toward major. Prerequisites: English [ENGLISH] 1000 and English [ENGLISH]/Film Studies [FILM\_S] 1800.

**ENGLISH 3855. Documentary Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3855). Surveys the history of documentary film including the development of subgenres, sound and voice over in documentary, re-enactment, ethical issues in documentary film production, and more. Graded on A/F basis only. Prerequisite: English [ENGLISH] 1000.

**ENGLISH 4000. Advanced Studies in English. 1-3 Credit.**

Advanced examination of subjects within English studies. Subjects vary from semester to semester. May repeat to six hours.

**ENGLISH 4004. Topics in English-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May repeat to six hours.

**ENGLISH 4040. Studies in Writing. 3 Credits.**

An advanced writing workshop in nonfiction prose. Topics (The Personal Narrative, Nature Writing) announced at time of registration. May repeat to six hours with departmental consent. Prerequisite: English [ENGLISH] 2010 or instructor's consent.

**ENGLISH 4045. Rhetorical Studies. 3 Credits.**

Examines questions related to rhetoric, the study of symbols used for persuasion, justification, or communication. Specific topics are announced at time of registration and may involve the rhetorical study of fiction or nonfiction, oral or written texts, verbal or visual modes. Prerequisites: English [ENGLISH] 1000, junior standing.

**ENGLISH 4050. Historical Survey of Rhetoric. 3 Credits.**

A survey of major works of rhetoric from Plato to the present day, with special attention to those works influencing English language rhetorics and theories of rhetoric. Prerequisites: English [ENGLISH] 1000 and sophomore standing.

**ENGLISH 4060. Studies in Critical Theory. 3 Credits.**

Focuses on questions raised by various critical theories, includes practice writing criticism that applies the theories to particular works. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4070. History of Criticism. 3 Credits.**

Surveys modern and contemporary theories of literary criticism: historical, archetypal, generic, formalist, phenomenological and interdisciplinary. Emphasizes key writers in each field. Prerequisite: junior standing.

**ENGLISH 4100. Genres. 3 Credits.**

Advanced survey of major movements and writers. Topics (e.g., American Poetry, The Development of the British Novel) announced at time of registration. Prerequisite: junior standing. No more than six hours may be taken in the Genres series.

**ENGLISH 4106. Genres, Beginning to 1603. 3 Credits.**

See English [ENGLISH] 4100 for course description.

**ENGLISH 4107. Genres, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 4100 for course description.

**ENGLISH 4108. Genres, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 4100 for course description.

**ENGLISH 4109. Genres, 1890 to Present. 3 Credits.**

See English [ENGLISH] 4100 for course description.

**ENGLISH 4120. Ethnic Literature. 3 Credits.**

Explores in depth the literary traditions of one of America's minority ethnic cultures: Native American, African-American, Hispanic American, Asian

American. Prerequisite: junior standing. No more than six hours may be taken in the Ethnic Literature series.

**ENGLISH 4127. Ethnic Literature, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 4120 for course description.

**ENGLISH 4128. Ethnic Literature, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 4120 for course description.

**ENGLISH 4129. Ethnic Literature, 1890 to Present. 3 Credits.**

See English [ENGLISH] 4120 for course description.

**ENGLISH 4140. Modern Literature. 3 Credits.**

A study of selected twentieth-century literature within the intellectual and cultural contexts of the modern era.

**ENGLISH 4150. World Literatures. 3 Credits.**

Study of important works and writers from Asia, Africa, Europe, Latin America or the mid-East. Topics (e.g., Survey of World Literature, The Bible) announced at time of registration. Prerequisite: junior standing. No more than six hours may be taken in the World Literature series.

**ENGLISH 4156. World Literatures, Beginning to 1603. 3 Credits.**

See English [ENGLISH] 4150 for course description.

**ENGLISH 4157. World Literatures, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 4150 for course description.

**ENGLISH 4158. World Literatures, 1789 to 1890. 3 Credits.**

See English [ENGLISH] 4150 for course description.

**ENGLISH 4159. World Literatures, 1890 to Present. 3 Credits.**

See English [ENGLISH] 4150 for course description.

**ENGLISH 4160. Major Authors. 3 Credits.**

Intensive study of the work of a single writer (e.g., Milton) or set of writers (e.g., Whitman and Dickinson). Topic announced at time of registration. No more than six hours may be taken in the Major Author series. Prerequisite: junior standing.

**ENGLISH 4166. Major Authors, Beginning to 1603. 3 Credits.**

See English [ENGLISH] 4160 for course description.

**ENGLISH 4167. Major Authors, 1603-1789. 3 Credits.**

See English [ENGLISH] 4160 for course description.

**ENGLISH 4168. Major Authors, 1789-1890. 3 Credits.**

See English [ENGLISH] 4160 for course description.

**ENGLISH 4169. Major Authors, 1890-Present. 3 Credits.**

See English [ENGLISH] 4160 for course description.

**ENGLISH 4170. Comparative Approaches to Literature. 3 Credits.**

Study of works separated by the places or eras of their composition, but united by themes or traditions. Topics (e.g., Poets of African Diaspora, Literatures of Exile) announced at time of registration. No more than six hours may be taken in the Comparative Approaches to Literature. Prerequisite: junior standing.

**ENGLISH 4176. Comparative Approaches to Literature, Beginning to 1603. 3 Credits.**

See English [ENGLISH] 4170 for course description.

**ENGLISH 4177. Comparative Approaches to Literature, 1609-1789. 3 Credits.**

See English [ENGLISH] 4170 for course description.

**ENGLISH 4178. Comparative Approaches to Literature, 1789-1890. 3 Credits.**

See English [ENGLISH] 4170 for course description.

**ENGLISH 4179. Comparative Approaches to Literature, 1890-Present. 3 Credits.**

See English [ENGLISH] 4170 for course description.

**ENGLISH 4180. Major Women Writers. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4180). Study of a limited number (1-3) of significant writers to be read intensively using contemporary feminist critical theory. No more than six hours may be taken in the Major Women Writers series.

**ENGLISH 4181. Themes in Literature by Women. 3 Credits.**

(same as Women's and Gender Studies [WGST] and Black Studies [BL\_STU] 4181). Examines works by a number of women writers with particular attention to their socio-political context. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4186. Major Women Writers, Beginning to 1603. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4186). See English [ENGLISH] 4180 for course description.

**ENGLISH 4187. Major Women Writers, 1603-1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4187). See English [ENGLISH] 4180 for course description.

**ENGLISH 4188. Major Women Writers, 1789-1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4188). See English [ENGLISH] 4180 for course description.

**ENGLISH 4189. Major Women Writers, 1890-Present. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4189). See English [ENGLISH] 4180 for course description.

**ENGLISH 4200. Introduction to Old English. 3 Credits.**

(same as Linguistics [LINGST] 4200). A beginning study of the Old English or Anglo-Saxon language in its cultural context, with emphasis on gaining a reading knowledge. Prerequisite: junior standing.

**ENGLISH 4210. Medieval Literature. 3 Credits.**

Representative works from the Anglo-Saxon and Middle-English periods. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4220. Renaissance and Seventeenth Century Literature. 3 Credits.**

Topics (e.g., The Metaphysical Poets, Themes in Shakespeare) announced at time of registration. No more than six hours may be taken in the Renaissance and Seventeenth Century Literature. Prerequisite: junior standing.

**ENGLISH 4226. Renaissance and Seventeenth Century Literature, Beginning to 1603. 3 Credits.**

See English [ENGLISH] 4220 for course description.

**ENGLISH 4227. Renaissance and Seventeenth Century Literature, 1603 to 1789. 3 Credits.**

See English [ENGLISH] 4220 for course description.

**ENGLISH 4240. Restoration and 18th-Century English Literature. 3 Credits.**

Topics (e.g., Restoration Drama, Johnson and his Circle) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4250. 19th-Century English Literature. 3 Credits.**

Topics (e.g., Victorian Poetry, Non-Fiction Prose) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing.



**ENGLISH 4260. 20th-Century British Literature. 3 Credits.**

Topics (e.g., Contemporary British Poets, The Post-War Novel) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4260H. 20th-Century British Literature - Honors. 3 Credits.**

Topics (e.g., Contemporary British Poets, The Post-War Novel) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing. Honors eligibility required.

**ENGLISH 4300. Early American Literature. 3 Credits.**

Topics (e.g., Narratives of Discovery and Exploration, The Puritan Heritage) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4310. 19th-Century American Literature. 3 Credits.**

Topics (e.g., American Romanticism, Regionalism) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4320. 20th-Century American Literature. 3 Credits.**

Topics (e.g., American Poetry since T. S. Eliot, The Short Story) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: junior standing.

**ENGLISH 4400. Studies in African Diaspora Literature. 3 Credits.**

(same as Black Studies [BL\_STU] 4400). Topics (e.g., African American Poetry, Africana Diaspora Drama) announced at time of registration. No more than six hours may be taken in the Studies in Africana Literature series. Prerequisite: junior standing.

**ENGLISH 4407. Studies in African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 4407). See English [ENGLISH] 4400 for course description.

**ENGLISH 4408. Studies in African Diaspora Literature, 1789 to 1890. 3 Credits.**

(same as Black Studies [BL\_STU] 4408). See English [ENGLISH] 4400 for course description.

**ENGLISH 4409. Studies in African Diaspora Literature, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] 4407). See English [ENGLISH] 4400 for course description.

**ENGLISH 4410. Major Africana Diaspora Writers. 3 Credits.**

(same as Black Studies [BL\_STU] 4410). An intensive study of selected writers of African Diaspora literature focusing on texts originally in English. No more than six hours may be taken in the Major African Diaspora Writers series. Prerequisite: junior standing or instructor's consent.

**ENGLISH 4417. Major African Diaspora Writers, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 4417). See English [ENGLISH] 4410 for course description.

**ENGLISH 4418. Major African Diaspora Writers, 1789-1890. 3 Credits.**

(same as Black Studies [BL\_STU] 4418). See English [ENGLISH] 4410 for course description.

**ENGLISH 4419. Major African Diaspora Writers, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] 4419). See English [ENGLISH] 4410 for course description.

**ENGLISH 4420. Africana Womanism. 3 Credits.**

(same as Black Studies [BL\_STU] 4420). An intensive study of Africana Womanism, focusing on selected Africana women writers. Prerequisites: junior standing or instructor's consent. May be repeated to six hours with departmental consent.

**ENGLISH 4480. Major African Diaspora Women Writers. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4480 and Black Studies [BL\_STU] 4480). Study of selected Africana Diaspora women writers, focusing on texts originally in English. Repeatable with department's consent. Maximum of 6 hours for English [ENGLISH] 4180 and 4480.

**ENGLISH 4487. Major African Diaspora Women Writers, 1603 to 1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4487 and Black Studies [BL\_STU] 4487). See English [ENGLISH] 4480 for course description.

**ENGLISH 4488. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4488 and Black Studies [BL\_STU] 4488). See English [ENGLISH] 4480 for course description.

**ENGLISH 4489. Major African Diaspora Women Writers, 1890 to Present. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4489 and Black Studies [BL\_STU] 4489). See English [ENGLISH] 4480 for course description.

**ENGLISH 4490. Native Studies. 3 Credits.**

In-depth study of topics in Native writing and representation, such as tribal intellectual histories, defined historical periods, or specific genres or media. Examples of course titles include Ojibwe Writing, Native Film and Video, and Contemporary Native Literature.

**ENGLISH 4510. Creative Writing: Advanced Fiction. 3 Credits.**

An intensive writing workshop in which student stories and related literary texts receive close reading and analysis. Prerequisite: English [ENGLISH] 2510 or equivalent.

**ENGLISH 4520. Creative Writing: Advanced Nonfiction Prose. 3 Credits.**

An intensive writing workshop in which a student's creative nonfiction receives close reading and analysis. Prerequisite: English [ENGLISH] 2520 or equivalent.

**ENGLISH 4530. Creative Writing: Advanced Poetry. 3 Credits.**

Poetry regarded as a mode of understanding. Poetic values related to other values. Practical consideration of verse techniques. Prerequisite: English [ENGLISH] 2530 or equivalent.

**ENGLISH 4560. Advanced Playwriting: Problems. 3 Credits.**

(same as Theatre [THEATR] 4920). Advanced study of the writing process as applied to theatre, including theory and practice. Special playwriting problems and techniques. Prerequisite: English [ENGLISH] 3560.

**ENGLISH 4570. Adaptation of Literature for the Stage. 3 Credits.**

(same as Theatre [THEATR] 4930). Explores adaptation principles and practices with literature not originally written for the stage. Identical to Theatre [THEATR] 4930. Graded on A/F basis only.

**ENGLISH 4600. Structure of American English. 3 Credits.**

(same as Linguistics [LINGST] 4600). Introduction to English linguistics. Study of the grammar and pronunciation of contemporary English, with the major focus on syntax. Prerequisite: junior standing.

**ENGLISH 4610. History of the English Language. 3 Credits.**

(same as Linguistics [LINGST] 4610). Historical changes in the grammar and pronunciation of the English language from Old English to the present. Introduction to Indo-European origins of English. Prerequisite: junior standing.

**ENGLISH 4620. Regional and Social Dialects of American English. 3 Credits.**

(same as Linguistics [LINGST] 4620). The study of regional and social variation in pronunciation, vocabulary, and grammar of American English. Prerequisite: English [ENGLISH] 4600 and English [ENGLISH] 4610 or equivalent.

**ENGLISH 4630. Phonology. 3 Credits.**

(same as Linguistics [LINGST] 4630). Survey of the sound patterns of English, with some comparison to other languages. Prerequisite: English [ENGLISH] 4600 or another introductory course in linguistics or phonetics.

**ENGLISH 4640. Syntax. 3 Credits.**

(same as Linguistics [LINGST] 4640). Study of the properties of phrase-and sentence-level grammar, emphasizing English, with some comparison to other languages. Prerequisite: English [ENGLISH] 4600 or another comparable linguistics course.

**ENGLISH 4650. Principles of Teaching English as a Second Language. 3 Credits.**

(same as Linguistics [LINGST] 4650 and Learning, Teaching and Curriculum [LTC] 4460). Linguistic and pedagogical principles of teaching English to speakers of other languages. Prerequisite: English [ENGLISH] 4600 and English [ENGLISH] 4610 or equivalent.

**ENGLISH 4670. Field Methods in Linguistics. 4 Credits.**

(same as Linguistics [LINGST] and Anthropology [ANTHRO] 4870). Provides training in the methods of constructing a detailed linguistic description and analysis of wholly unfamiliar language, based on interviews with a native speaker. Prerequisites: Linguistics [LINGST]/ Anthropology [ANTHRO]/ English [ENGLISH]/ Communication Science Disorders [C\_S\_D] 1060; Linguistics [LINGST]/ English [ENGLISH] 4600; Linguistics [LINGST]/ English [ENGLISH] 4630; Linguistics [LINGST]/ English [ENGLISH] 4640. Concurrent enrollment in Linguistics [LINGST]/ English [ENGLISH] 4630 or Linguistics [LINGST]/ English [ENGLISH] 4640 is ok. Graded on A/F basis only. May be repeated for credit.

**ENGLISH 4700. Special Themes in Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 4150). Intensive study in a selected area of folklore: folk narrative, folk song, myth, proverb, etc., folklore of a particular group. May be repeated for a maximum of six hours with department's consent.

**ENGLISH 4710. Themes in African Diaspora Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 4160 and Black Studies [BL\_STU] 4710). Intensive study in a selected area of African Diaspora folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature; or the folklore of a particular group. English [ENGLISH] 4700 and 4710 may be repeated for a maximum of six hours with instructor's consent. Prerequisite: junior standing.

**ENGLISH 4770. Oral Tradition. 3 Credits.**

(same as Classical Humanities [CL\_HUM] 4770). Study of verbal art from living oral traditions (e.g., Native American and African American)

and important literary works with roots in oral tradition (e.g., the Bible, the Iliad, the Odyssey, and Beowulf). Prerequisite: junior standing and instructor's consent.

**ENGLISH 4780. Women's Folklore and Feminist Theory. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4780). Examines folklore and artistic expression of women in relation to feminist theory and in multicultural contexts. Includes verbal genres (narrative/ song) as well as material genres (quilting/arts). Prerequisite: junior standing or instructor's consent.

**ENGLISH 4810. Film Theory. 3 Credits.**

(same as FILM\_S 4810). This course explores contemporary trends in film theory. Topics may include: psychoanalysis, feminism, Marxism, cultural studies, queer theory, audience and star studies, postcolonialism, among others. Prerequisite: ENGLISH 1000 and ENGLISH 1800 or FILM\_S]1800. Junior standing or above required.

**ENGLISH 4820. Studies in Film Genre. 3 Credits.**

(same as Film Studies [FILM\_S] 4820) Topics (e.g. The Western, Film Noir) announced at time of registration. No more than six hours may be taken for credit toward the major. Prerequisite: English [ENGLISH] 1000 and English/Film Studies [ENGLISH/FILM\_S] 1800; junior standing or instructor's consent.

**ENGLISH 4840. Culture and Media. 3 Credits.**

(Same as Film Studies [FILM\_S] 4840). Topics (e.g. Cinema and Imperialism, Indigenous Media, Ethnographic Documentary) announced at time of registration. No more than six hours may be taken for credit toward the major. Prerequisite: English [ENGLISH] 1000 and English/Film Studies [ENGLISH/FILM\_S] 1800. Junior standing or instructor's consent required.

**ENGLISH 4935. Adaptation of Literature for Film. 3 Credits.**

(same as Film Studies [FILM\_S] 4935 and Theatre [THEATR] 4935). This upper-division course will explore adaptation principles and practices with a variety of forms of literature that were not originally written for film.

**ENGLISH 4940. Internship in English. 1-3 Credit.**

Students work in an agency or institution using their English-related skills for one to three credit hours. Prerequisite: junior standing, department's consent. Graded on an S/U basis only.

**ENGLISH 4950. Internship in Publishing. 3 Credits.**

Offers practical experience working with a literary or scholarly publication edited or sponsored by faculty members. Graduate students in English must take the course two semesters in order to count three hours toward the completion of their program. Prerequisite: instructor's consent.

**ENGLISH 4955. Independent Research in English. 1-3 Credit.**

Development of a carefully considered research project under close supervision of a faculty member. Open to undergraduate students only. Prerequisites: junior standing and departmental consent.

**ENGLISH 4960. Special Readings in English. 1-99 Credit.**

Individual work with conferences adjusted to needs of student. Prerequisites: 4000-level course in area of proposed work and written consent of instructor. Restricted to senior English majors in their final semester.

**ENGLISH 4970. Capstone Experience. 3 Credits.**

For students in their last semester, this course focuses on a major project and the processes of selection, research, and writing leading to its completion. Includes a professional component (resume, cover letter). Prerequisite: English major with senior standing.

**ENGLISH 4995. Senior Honors Thesis. 3 Credits.**

Independent research under direction of faculty. Second course of two part Honors Sequence. Prerequisite: English [ENGLISH] 4996.

**ENGLISH 4996. Honors Seminar in English. 3 Credits.**

First of two major semester Honors sequence. Studies literary topic, critical approaches and advanced literary research methodology in preparation for Honors Senior Thesis. Prerequisite: 3.3 overall GPA and in major.

**ENGLISH 7004. Topics in English-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May repeat to six hours. Prerequisite: graduate standing.

**ENGLISH 7040. Studies in Writing. 3 Credits.**

An advanced writing workshop in nonfiction prose. Topics (The Personal Narrative, Nature Writing) announced at time of registration. May repeat to six hours with departmental consent. Prerequisite: graduate standing and English [ENGLISH] 2010 or instructor's consent.

**ENGLISH 7045. Rhetorical Studies. 3 Credits.**

Examines questions related to rhetoric, the study of symbols used for persuasion, justification, or communication. Specific topics are announced at time of registration and may involve the rhetorical study of fiction or nonfiction, oral or written texts, verbal or visual modes.

**ENGLISH 7050. Historical Survey of Rhetoric. 3 Credits.**

A survey of major works of rhetoric from Plato to the present day, with special attention to those works influencing English language rhetoric's and theories of rhetoric. Prerequisites: English [ENGLISH] 1000 and graduate standing.

**ENGLISH 7060. Studies in Critical Theory. 3 Credits.**

Focuses on questions raised by various critical theories, includes practice writing criticism that applies the theories to particular works. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7070. History of Criticism. 3 Credits.**

Surveys modern and contemporary theories of literary criticism: historical, archetypal, generic, formalist, phenomenological and interdisciplinary. Emphasizes key writers in each field. Prerequisite: graduate standing.

**ENGLISH 7100. Genres. 3 Credits.**

Advanced survey of major movements and writers. Topics (e.g., American Poetry, The Development of the British Novel) announced at time of registration. Prerequisite: graduate standing. No more than six hours may be taken in the Genres series.

**ENGLISH 7106. Genres, Beginning to 1603. 3 Credits.**

See English 7100 for course description.

**ENGLISH 7107. Genres, 1603 to 1789. 3 Credits.**

See English 7100 for course description.

**ENGLISH 7108. Genres, 1789 to 1890. 3 Credits.**

See English 7100 for course description.

**ENGLISH 7109. Genres, 1890 to Present. 3 Credits.**

See English 7100 for course description.

**ENGLISH 7120. Ethnic Literature. 3 Credits.**

Explores in depth the literary traditions of one of America's minority ethnic cultures: Native American, African-American, Hispanic American, Asian American. Prerequisite: junior standing. No more than six hours may be taken in the Ethnic Literature series.

**ENGLISH 7127. Ethnic Literature, 1603 to 1789. 3 Credits.**

See English 7120 for course description.

**ENGLISH 7128. Ethnic Literature, 1789 to 1890. 3 Credits.**

See English 7120 for course description.

**ENGLISH 7129. Ethnic Literature, 1890 to Present. 3 Credits.**

See English 7120 for course description.

**ENGLISH 7140. Modern Literature. 3 Credits.**

A study of selected twentieth-century literature within the intellectual and cultural contexts of the modern era. Prerequisite: graduate standing.

**ENGLISH 7150. World Literatures. 3 Credits.**

Study of important works and writers from Asia, Africa, Europe, Latin America or the mid-East. Topics (e.g., Survey of World Literature, The Bible) announced at time of registration. Prerequisite: graduate standing. No more than six hours may be taken in the World Literatures series.

**ENGLISH 7156. World Literatures, Beginning to 1603. 3 Credits.**

See English 7150 for course description.

**ENGLISH 7157. World Literatures, 1603 to 1789. 3 Credits.**

See English 7150 for course description.

**ENGLISH 7158. World Literatures, 1789 to 1890. 3 Credits.**

See English 7150 for course description.

**ENGLISH 7159. World Literatures, 1890 to Present. 3 Credits.**

See English 7150 for course description.

**ENGLISH 7160. Major Authors. 3 Credits.**

Intensive study of the work of a single writer (e.g., Milton) or set of writers (e.g., Whitman and Dickinson). Topic announced at time of registration. No more than six hours may be taken in the Major Authors series. Prerequisite: graduate standing.

**ENGLISH 7166. Major Authors, Beginning to 1603. 3 Credits.**

See English 7160 for course description.

**ENGLISH 7167. Major Authors, 1603-1789. 3 Credits.**

See English 7160 for course description.

**ENGLISH 7168. Major Authors, 1789-1890. 3 Credits.**

See English 4160 for course description.

**ENGLISH 7169. Major Authors, 1890-Present. 3 Credits.**

See English 4160 for course description.

**ENGLISH 7170. Comparative Approaches to Literature. 3 Credits.**

Study of works separated by the places or eras of their composition, but united by themes or traditions. Topics (e.g., Poets of African Diaspora, Literatures of Exile) announced at time of registration. No more than six hours may be taken in the Comparative Approaches to Literature Series. Prerequisite: graduate standing.

**ENGLISH 7176. Comparative Approaches to Literature, Beginning to 1603. 3 Credits.**

See English 7170 for course description.

**ENGLISH 7177. Comparative Approaches to Literature, 1609-1789. 3 Credits.**

See English 7170 for course description.

**ENGLISH 7178. Comparative Approaches to Literature, 1789-1890. 3 Credits.**

See English 7170 for course description.

**ENGLISH 7179. Comparative Approaches to Literature, 1890-Present. 3 Credits.**

See English 7170 for course description.

**ENGLISH 7180. Major Women Writers. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7180). Study of a limited number (1-3) of significant writers to be read intensively using contemporary feminist critical theory. No more than six hours may be taken in the Major Women Writers series. Prerequisite: graduate standing.

**ENGLISH 7181. Themes in Literature by Women. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7181). Examines works by a number of women writers with particular attention to their socio-political context. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7186. Major Women Writers, Beginning to 1603. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7186). See English 7180 for course description.

**ENGLISH 7187. Major Women Writers, 1603-1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7187). See English 7180 for course description.

**ENGLISH 7188. Major Women Writers, 1789-1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7188). See English 7180 for course description.

**ENGLISH 7189. Major Women Writers, 1890-Present. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7189). See English 7180 for course description.

**ENGLISH 7200. Introduction to Old English. 3 Credits.**

(same as Linguistics [LINGST] 7200). A beginning study of the Old English or Anglo-Saxon language in its cultural context, with emphasis on gaining a reading knowledge. Prerequisite: graduate standing.

**ENGLISH 7210. Medieval Literature. 3 Credits.**

Representative works from the Anglo-Saxon and Middle-English periods. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7220. Renaissance and 17th-Century English Literature. 3 Credits.**

Topics (e.g., The Metaphysical Poets, Themes in Shakespeare) announced at time of registration. No more than six hours may be taken in the Renaissance and Seventeenth Century Literature series. Prerequisite: graduate standing.

**ENGLISH 7226. Renaissance and Seventeenth Century Literature, Beginning to 1603. 3 Credits.**

See English 7220 for course description.

**ENGLISH 7227. Renaissance and Seventeenth Century Literature, 1603-1789. 3 Credits.**

See English 7220 for course description.

**ENGLISH 7240. Restoration and 18th-Century English Literature. 3 Credits.**

Topics (e.g., Restoration Drama, Johnson and his Circle) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7250. 19th-Century English Literature. 3 Credits.**

Topics (e.g., Victorian Poetry, Non-Fiction Prose) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7260. 20th-Century British Literature. 3 Credits.**

Topics (e.g. Contemporary British Poets, The Post-War Novel) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7300. Early American Literature. 3 Credits.**

Topics (e.g., Narratives of Discovery and Exploration, The Puritan Heritage) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7310. 19th-Century American Literature. 3 Credits.**

Topics (e.g., American Romanticism, Regionalism) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7320. 20th-Century American Literature. 3 Credits.**

Topics (e.g., American Poetry since T. S. Eliot, The Short Story) announced at time of registration. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7400. Studies in African Diaspora Literature. 3 Credits.**

(same as Black Studies [BL\_STU] 7400). Topics (e.g., African American Poetry, African Diaspora Drama) announced at time of registration. No more than six hours may be taken in the Studies in African Diaspora Literature series. Prerequisite: graduate standing.

**ENGLISH 7407. Studies in African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 7407). See English [ENGLISH] 7400 for course description.

**ENGLISH 7408. Studies in African Diaspora Literature, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 7408). See English [ENGLISH] 7400 for course description.

**ENGLISH 7409. Studies in African Diaspora Literature, 1890-to Present. 3 Credits.**

(same as Black Studies [BL\_STU] 7409). See English [ENGLISH] 7400 for course description.

**ENGLISH 7410. Major African Diaspora Writers. 3 Credits.**

(same as Black Studies [BL\_STU] 7410). An intensive study of selected writers of African Diaspora literature, focusing on texts originally in English. No more than six hours may be taken in the Major African Diaspora Writers series. Prerequisite: graduate standing or instructor's consent.

**ENGLISH 7417. Major African Diaspora Writers, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] 7417). See English 7410 for course description.

**ENGLISH 7418. Major African Diaspora Writers, 1789 to 1890. 3 Credits.**

(same as Black Studies [BL\_STU] 7418). See English [ENGLISH] 7410 for course description.

**ENGLISH 7419. Major African Diaspora Writers, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] 7419). See English [ENGLISH] 7410 for course description.

**ENGLISH 7420. Africana Womanism. 3 Credits.**

(same as Black Studies [BL\_STU] 7420). An intensive study of Africana Womanism, focusing on selected Africana women writers. Prerequisites: graduate standing or instructor's consent. May be repeated to six hours with departmental consent.

**ENGLISH 7480. Major African Diaspora Women Writers. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7480 and Black Studies [BL\_STU] 7480). Study of selected African Diaspora women writers, focusing on texts originally in English. Repeatable with department's consent. Maximum of 6 hours for English [ENGLISH] 7180 and 7480. Prerequisite: graduate standing.

**ENGLISH 7487. Major African Diaspora Women Writers, 1603 to 1789. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7487 and Black Studies [BL\_STU] 7487). See English [ENGLISH] 7480 for course description.

**ENGLISH 7488. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7488 and Black Studies [BL\_STU] 7488). See English [ENGLISH] 7480 for course description.

**ENGLISH 7489. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7489 and Black Studies [BL\_STU] 7489). See English [ENGLISH] 7480 for course description.

**ENGLISH 7490. Native Studies. 3 Credits.**

In-depth study of topics in Native writing and representation, such as tribal intellectual histories, defined historical periods, or specific genres or media. Examples of course titles include Ojibwe Writing, Native Film and Video, and Contemporary Native Literature.

**ENGLISH 7510. Creative Writing: Advanced Fiction. 3 Credits.**

An intensive writing workshop in which student stories and related literary texts receive close reading and analysis. Prerequisite: graduate standing and English [ENGLISH] 2510 or equivalent.

**ENGLISH 7520. Creative Writing: Advanced Nonfiction Prose. 3 Credits.**

An intensive writing workshop in which a student's creative nonfiction receives close reading and analysis. Prerequisite: graduate standing and English [ENGLISH] 2520 or equivalent.

**ENGLISH 7530. Creative Writing: Advanced Poetry. 3 Credits.**

Poetry regarded as a mode of understanding. Poetic values related to other values. Practical consideration of verse techniques. Prerequisite: graduate standing and English [ENGLISH] 2530 or equivalent.

**ENGLISH 7560. Advanced Playwriting: Problems. 3 Credits.**

(same as Theatre [THEATR] 7920). Advanced study of the writing process as applied to theatre, including theory and practice. Special playwriting problems and techniques. Prerequisite: graduate standing and English [ENGLISH] 3560.

**ENGLISH 7570. Adaptation of Literature for the Stage. 3 Credits.**

(same as Theatre [THEATR] 7930). Explores adaptation principles and practices with a variety of forms of literature that were not originally written for the stage. Prerequisite: Graduate standing and consent of instructor.

**ENGLISH 7580. Adaptation of Literature for Film. 3 Credits.**

(same as Film Studies [FILM\_S] 7935 and Theatre [THEATR] 7935). This upperdivision course will explore adaptation principles and practices with a variety of forms of literature that were not originally written for film.

**ENGLISH 7600. Structure of American English. 3 Credits.**

(same as Linguistics [LINGST] 7600). Introduction to English linguistics. Study of the grammar and pronunciation of contemporary English, with the major focus on syntax. Prerequisite: graduate standing.

**ENGLISH 7610. History of the English Language. 3 Credits.**

(same as Linguistics [LINGST] 7610). Historical changes in the grammar and pronunciation of the English language from Old English to the present. Introduction to Indo-European origins of English. Prerequisite: graduate standing.

**ENGLISH 7620. Regional and Social Dialects of American English. 3 Credits.**

(same as Linguistics [LINGST] 7620). The study of regional and social variation in pronunciation, vocabulary, and grammar of American English. Prerequisite: English [ENGLISH] 4600 and English [ENGLISH] 4610 or equivalent. Graduate standing.

**ENGLISH 7630. Phonology. 3 Credits.**

(same as Linguistics [LINGST] 7630). Survey of the sound patterns of English, with some comparison to other languages. Prerequisite: graduate standing and English [ENGLISH] 4600 or another introductory course in linguistics or phonetics.

**ENGLISH 7640. Syntax. 3 Credits.**

(same as Linguistics [LINGST] 7640). Study of the properties of phrase-and sentence-level grammar, emphasizing English, with some comparison to other languages. Prerequisite: graduate standing and English [ENGLISH] 4600 or another comparable linguistics course.

**ENGLISH 7650. Principles of Teaching English as a Second Language. 3 Credits.**

(same as Linguistics [LINGST] 7650). Linguistic and pedagogical principles of teaching English to speakers of other languages. Prerequisite: English [ENGLISH] 4600 and English [ENGLISH] 4610 or equivalent. Graduate standing.

**ENGLISH 7670. Field Methods in Linguistics. 3 Credits.**

(Same as Linguistics [LINGST] 7870 and Anthropology [ANTHRO] 7870) Provides training in the methods of constructing a detailed linguistic description and analysis of a wholly unfamiliar language, based on interviews with a native speaker. Graduate standing required. Course graded on A/F basis only. Prerequisites: Linguistics [LINGST] 1060, Linguistics [LINGST] 7600, Linguistics [LINGST] 7630 and Linguistics [LINGST] 7640. Concurrent enrollment in Linguistics [LINGST] 7630 or 7640.

**ENGLISH 7700. Special Themes in Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 7150). Intensive study in a selected area of folklore: folk narrative, folk song, myth, proverb, etc., folklore of a particular group. May be repeated for a maximum of six hours with department's consent. Prerequisite: graduate standing.

**ENGLISH 7710. Themes in African Diaspora Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 7160 and Black Studies [BL\_STU] 7710). Intensive study in a selected area of African Diaspora folklore: folk narrative, folk song, myth, proverb, etc., folklore and literature; or the folklore of a particular group. English [ENGLISH] 7700 and 7710 may be repeated for a maximum of six hours with instructor's consent. Prerequisite: graduate standing.

**ENGLISH 7770. Oral Tradition. 3 Credits.**

(same as Classical Humanities [CL\_HUM] 4770). Study of verbal art from living oral traditions (e.g., Native American and African American) and important literary works with roots in oral tradition (e.g., the Bible, the

Iliad the Odyssey, and Beowulf). Prerequisite: graduate standing and instructor's consent.

**ENGLISH 7780. Women's Folklore and Feminist Theory. 3 Credits.** (same as Women's and Gender Studies [WGST] 7780). Examines folklore and artistic expression of women in relation to feminist theory and in multicultural contexts. Includes verbal genres (narrative/ song) as well as material genres (quilting/arts). Prerequisite: graduate standing or instructor's consent.

**ENGLISH 7810. Film Theory. 3 Credits.** (same as FILM\_S 7810). This course explore contemporary trends in film theory. Topics may include: psychoanalysis, feminism, Marxism, cultural studies, queer theory, audience and star studies, postcolonialism, among others. Graded on A-F basis only.

**ENGLISH 7840. Culture and Media. 3 Credits.** (same as Film Studies [FILM\_S] 7840). Topics (e.g. Cinema and Imperialism, Indigenous Media, Ethnographic Documentary) announced at time of registration. No more than six hours may be taken for credit toward the major. Prerequisite: graduate standing.

**ENGLISH 7950. Internship in Publishing. 3 Credits.** Offers practical experience working with a literary or scholarly publication edited or sponsored by faculty members. Graduate students in English must take the course two semesters in order to count three hours toward the completion of their program. Prerequisite: graduate standing and instructor's consent.

**ENGLISH 8001. Topics in English-General. 1-99 Credit.** Organized study of selected topics. Subjects and earnable credit may vary from semester to semester.

**ENGLISH 8005. Introduction to Graduate Study. 1 Credit.** Introduces entering MA and PhD students to the profession of English and the intellectual resources needed to complete their degrees successfully.

**ENGLISH 8006. Professional Issues in English Studies. 3 Credits.** Introduces advanced graduate students to issues relevant to their professional training, including entering the job market and preparing work for publication. May be repeated for credit. Graduate standing required.

**ENGLISH 8010. Theory and Practice of Composition. 3 Credits.** Current and historical theories of rhetoric and composition as applied to the teaching of college composition. Prerequisite: department's consent. Graduate Standing Required.

**ENGLISH 8040. Seminar in Rhetoric and Composition. 3 Credits.** Topics (e.g., The Institutionalization of Rhetoric, Writing Across the Curriculum) announced at time of registration. May repeat to twelve hours with department's approval. Graduate Standing Required.

**ENGLISH 8050. Contemporary Critical Approaches. 3 Credits.** A survey of contemporary professional critical methods, such as formalism, poststructuralism, feminism, Marxism, new historicism, psychoanalysis, identity studies, and cultural studies.

**ENGLISH 8060. Seminar in Criticism and Theory. 3 Credits.** Principles and practices of selected critics. May repeat to twelve hours with department's consent.

**ENGLISH 8070. History of Criticism and Theory. 3 Credits.** A survey of the history of literary criticism and theory. While comprehensive in scope, the course might focus on specific topics in the history of criticism, such as the dialectic between rhetoric and poetics,

the rise of aesthetics, or the relation of art and culture to society. Figures studied will extend from early philosophers such as Plato and Aristotle, through eighteenth-century thinkers such as Kant and Johnson, up to present theorists such as Derrida and Butler. Graduate Standing Required.

**ENGLISH 8090. Masters Thesis Research. 1-99 Credit.** Leads to preparation of masters thesis. Graded on S/U basis only. Graduate Standing Required.

**ENGLISH 8095. Problems in English. 1-99 Credit.** Individual work not leading to preparation of dissertation. Prerequisite: departmental approval. Graduate Standing Required.

**ENGLISH 8110. Forms. 3 Credits.** Topics (e.g., The Epic, The Epistolary Novel) announced at time of registration. May repeat to twelve hours with department's approval. Graduate Standing Required.

**ENGLISH 8200. Seminar in Old English Literature. 3 Credits.** Topics in Old English or Anglo-Saxon literature, such as Beowulf, the Exeter Book poems, or the genres of elegy, Biblical narrative, or wisdom poetry. May repeat to twelve hours with department's approval. Prerequisite: English [ENGLISH] 4200 or equivalent. Graduate Standing Required.

**ENGLISH 8210. Seminar in Middle English Literature. 3 Credits.** Topics (e.g., Medieval Drama, Chaucer) announced at time of registration. May repeat to twelve hours with department's approval. Graduate Standing Required.

**ENGLISH 8220. Seminar in Renaissance British Literature. 3 Credits.** Topics (e.g., Tudor and Stuart Drama, Shakespearean Tragedy) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8230. Seminar in 17th-Century British Literature. 3 Credits.** Topics (e.g., The Metaphysical Poets, Restoration Drama) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8240. Seminar in 18th-Century British Literature. 3 Credits.** Topics (e.g., The 18th-Century Novel, Historical and Biographical Prose) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8250. Seminar in 19th-Century British Literature. 3 Credits.** Topics (e.g., The Later Romantics, Victorian Poetry) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8260. Seminar in 20th-Century British Literature. 3 Credits.** Topics (e.g., Chief Contemporary Poets, Modernism and the Novel) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8300. Seminar in Early American Literature. 3 Credits.** Topics (e.g., Religious and Philosophical Writings, The Revolutionary Period) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8310. Seminar in 19th Century American Literature. 3 Credits.** Topics (e.g., The Transcendentalists, American Realism) announced at time of registration. May repeat to twelve hours with department's consent.

**ENGLISH 8320. Seminar in 20th-Century American Literature. 3 Credits.**

Topics (e.g., The African-American Novel, Chief Contemporary Poets) announced at time of registration. May repeat to twelve hours with department's consent.

**ENGLISH 8400. Seminar in African Diaspora Literature. 3 Credits.**

(same as Black Studies [BL\_STU] 8400). Topic (e.g., Autobiography, Black Women Writers) announced at time of registration. May be repeated to 12 hours with departmental consent.

**ENGLISH 8410. Seminar in African Diaspora Theory and Literature Criticism. 3 Credits.**

(same as Black Studies [BL\_STU] 8410). Modern and contemporary African Diaspora criticism and theory including the diverse approaches to literary and cultural studies. May be repeated to 12 hours with departmental consent. Prerequisite: graduate standing.

**ENGLISH 8510. Advanced Writing of Fiction. 3 Credits.**

Advanced fiction writing designed primarily for graduate students, with the intention of producing work of professional quality. May repeat to twelve hours with consent of instructor. Prerequisite: instructor's consent and English [ENGLISH] 4510.

**ENGLISH 8520. Advanced Writing of Nonfiction Prose. 3 Credits.**

Advanced workshop in nonfiction prose primarily for graduate students intending to produce professional quality work. Prerequisite: instructor's consent.

**ENGLISH 8530. Advanced Writing of Poetry. 3 Credits.**

Advanced poetry writing designed primarily for graduate students with the intention of producing work of professional quality. May repeat to twelve hours with consent of instructor. Prerequisite: instructor's consent and English [ENGLISH] 4530.

**ENGLISH 8560. Graduate Seminar in Playwriting. 3 Credits.**

(same as Theatre [THEATR] 8920). Seminar in theory, practice, and pedagogy of playwriting, students a mid-term in playwriting theory, a full-length play, a research paper, and a syllabus and lesson plans for an undergraduate playwriting course.

**ENGLISH 8600. Seminar in the English Language. 3 Credits.**

(same as Linguistics [LINGST] 8600). Descriptive and historical studies of the English language. Topics (e.g., The Germanic Origins, Modern Syntactic Analysis) announced at time of registration. May repeat to twelve hours with department's approval.

**ENGLISH 8700. Seminar in Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 8157 and Religious Studies [REL\_ST] 8700). Focus on the roots of folklore scholarship and methodology and their evolution in modern approaches to the study of oral, traditional verbal genres and their performance in natural folk groups. Graduate standing or permission of instructor. May repeat to twelve hours with department's consent.

**ENGLISH 8770. Seminar in Oral Tradition. 3 Credits.**

Theoretical and interpretive perspectives on works of verbal art that have roots in oral tradition. Emphasis on the variety of approaches employed (performance theory oral theory, ethnopoetics, ethnography of speaking, comparative structural studies, etc.) May repeat to twelve hours with department's consent.

**ENGLISH 9090. Doctoral Dissertation Research. 1-12 Credit.**

Leads to preparation of dissertation. Graded on S/U basis only.

## English Language Support Program (ELSP)

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**ELSP\_0100. Grammar and Composition I. 3 Credits.**

Grammar and Composition I. Graded S/U only.

**ELSP\_0200. Reading and Vocabulary. 3 Credits.**

Reading and Vocabulary. Graded on S/U basis only.

**ELSP\_0300. Grammar and Composition II. 3 Credits.**

Grammar and Composition II. Graded S/U Only.

**ELSP\_0400. Oral Communication. 3 Credits.**

Oral Communication. Graded S/U Only.

## Environmental Science (ENV\_SC)

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**ENV\_SC 1001. Topics in Environmental Science - General. 1-99 Credit.**

Organized study of selected topics in environmental science.

**ENV\_SC 1100. Introduction to Environmental Science. 3 Credits.**

This class provides an opportunity to develop an understanding of environment, physical and social causes of environmental problems, their impacts, and strategies to manage these issues. Prerequisites: Restricted to freshman; sophomores and juniors or instructor's consent.

**ENV\_SC 2001. Topics in Environmental Science - General. 1-99 Credit.**

Organized study of selected topics in environmental science.

**ENV\_SC 2002. Topics in Environmental Science- Biological/ Physical/Mathematical. 1-99 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester.

**ENV\_SC 3001. Topics in Environmental Science - General. 1-99 Credit.**

Organized study of selected topics in environmental science.

**ENV\_SC 3085. Problems in Environmental Science. 1-99 Credit.**

Special individualized projects or readings in environmental science.

**ENV\_SC 3250. Pollutant Fate and Transport. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 3250). Introduction to concepts governing pollutant fate and transport in the environment, including pollutant interactions within and migration through environmental systems, as well as analytical techniques and tools necessary to quantify conditions and movement. Prerequisites: Environmental Sciences [ENV\_SC] 1100 or Soil Science [SOIL] 2100 or Civil Engineering [CV\_ENG] 3200; and Chemistry [CHEM] 1320; or instructor's permission.

**ENV\_SC 3290. Soils and the Environment. 3 Credits.**

(same as Soil Science [SOIL] 3290). Addresses the role of soils and soil properties on environmental pollution and management. Emphasis will be placed on carbon, nitrogen, phosphorus, and sulfur transformations and transport in natural and disturbed ecosystems and soil management practices and technology to prevent or remediate environmental pollution. Prerequisites: Soil Science [SOIL] 2100, 3 hrs of chemistry, English [ENGLISH] 1000 or instructor's consent.

**ENV\_SC 3330. Environmental Land Use Management. 3 Credits.**

An introduction to environmentally sustainable use and management of land.

**ENV\_SC 3500. Pollutant Fate and Transport. 3 Credits.**

This course introduces students to concepts governing pollutant fate and transport in the environment, and it provides students with the quantitative tools necessary to estimate the fate and transport of pollutants in the environment. Prerequisite: Environmental Science [ENV\_SC] 1100 or Soil Science [SOIL] 2100, and Chemistry [CHEM] 1310 and 1320.

**ENV\_SC 4001. Topics in Environmental Science - General. 1-99 Credit.**

Organized study of selected topics in environmental science.

**ENV\_SC 4085. Problems in Environmental Science. 1-99 Credit.**

Special individualized research projects or readings in environmental science.

**ENV\_SC 4305. Environmental Soil Physics. 3 Credits.**

(same as Soil Science [SOIL] 4305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat. Prerequisites: SOIL 2100, Physics [PHYSICS] 1210 or equivalent.

**ENV\_SC 4306. Environmental Soil Physics Laboratory. 2 Credits.**

(same as Soil Science [SOIL] 4306). Introduction to the methodology and equipment for measurement of soil physical properties and processes. Prerequisites: concurrent or previous enrollment in Environmental Science [ENV\_SC] 4305.

**ENV\_SC 4312. Environmental Soil Microbiology. 3 Credits.**

(same as Soil Science [SOIL] 4312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic transformation bioremediation, etc. Prerequisite: general microbiology, SOIL 2100, or instructor's consent.

**ENV\_SC 4318. Environmental Soil Chemistry. 3 Credits.**

(same as Soil Science [SOIL] 4318 and Geology [GEOL] 4318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes. Prerequisites: SOIL 2100 or GEOL 2400, Chemistry [CHEM] 1320 and 1330. Junior standing or instructor's consent.

**ENV\_SC 4320. Hydrologic and Water Quality Modeling. 3 Credits.**

(same as Natural Resources [NAT\_R] 4320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on watersheds to provide experience with the use of simulation models for natural resource decision making. Prerequisites: Environmental Science [ENV\_SC] 1100 or Soil Science [SOIL] 2100 or equivalent.

**ENV\_SC 4396. Agroforestry for Watershed Restoration. 3 Credits.**

Agroforestry for watershed restoration will focus on integrated approaches for improved water quality, soil health, and economic benefits. Students will learn principles and practices, critical analysis and application of agroforestry practices to improve overall environmental quality. Prerequisite: Forestry [FOREST] 4385/7385 or permission of instructor. May be repeated for credit. Graded on A/F basis only.

**ENV\_SC 4940. Environmental Science Internship. 1-99 Credit.**

Supervised professional experience with an approved public or private organization. Graded on S/U basis only.

**ENV\_SC 4950. Undergraduate Research in Environmental Science. 1-4 Credit.**

Research apprenticeship with a faculty mentor. Students are expected to develop initial concept for the research, design experiments, collect data, and analyze data with faculty input, oversight, and guidance.

Prerequisites: Environmental Science [ENV\_SC] 1100, Statistics [STAT] 2530 and 9 hours of Environmental Science with at least 3 hours above the 3000-level and instructor's consent.

**ENV\_SC 7001. Topics in Environmental Science. 1-99 Credit.**

Organized study of selected topics in environmental science. Intended for graduate students.

**ENV\_SC 7085. Problems in Environmental Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in environmental science.

**ENV\_SC 7305. Environmental Soil Physics. 3 Credits.**

(same as Soil Science [SOIL] 7305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat. Prerequisites: graduate standing SOIL 2100, Physics [PHYSICS] 1210 or equivalent.

**ENV\_SC 7306. Environmental Soil Physics Laboratory. 2 Credits.**

(same as Soil Science [SOIL] 7306). Introduction to the methodology and equipment for measurement of soil physical properties and properties and processes. Prerequisites: graduate standing and concurrent or previous enrollment in Soil Science [SOIL] 4305.

**ENV\_SC 7312. Environmental Soil Microbiology. 3 Credits.**

(same as Soil Science [SOIL] 7312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic degradation and bioremediation, soil quality and pathogen regulation in the environment. Nitrogen fixation, mycorrhizal processes are discussed.

**ENV\_SC 7318. Environmental Soil Chemistry. 3 Credits.**

(same as Soil Science [SOIL] 7318 and Geology [GEOL] 7318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes. Prerequisites: SOIL 2100 or GEOL 2400, Chemistry [CHEM] 1320 and 1330. Graduate standing or instructor's consent.

**ENV\_SC 7320. Hydrologic and Water Quality Modeling. 3 Credits.**

(same as Natural Resources [NAT\_R] 7320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on watersheds to provide experience with the use of simulation models for natural resource decision making. Prerequisites: Environmental Science [ENV\_SC] 1100 or Soil Science [SOIL] 2100 or equivalent.

**ENV\_SC 7396. Agroforestry for Watershed Restoration. 3 Credits.**

Agroforestry for watershed restoration will focus on integrated approaches for improved water quality, soil health, and economic benefits. Students will learn principles and practices, critical analysis and application of agroforestry practices to improve overall environmental quality. Prerequisite: Forestry [FOREST] 4385/7385 or permission of instructor. May be repeated for credit. Graded on A/F basis only.

**ENV\_SC 8001. Topics in Environmental Science. 1-99 Credit.**

Organized study of selected topics in environmental science. Intended for graduate students.



**ENV\_SC 8085. Problems in Environmental Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in environmental science.

**ENV\_SC 8090. Masters Research in Environmental Science. 1-10 Credit.**

Original investigations in environmental science for presentation in a thesis. Graduate standing required. Graded on S/U basis only.

**ENV\_SC 8400. Solute Transport in the Vadose Zone. 3 Credits.**

(same as Soil Science [SOIL] 8400). Transport of water and solutes in geomeidia with emphasis on development of the equations of flow. Evaluation of analytical and numeral solutions to equations describing transport phenomena. Prerequisites: Environmental Science [ENV\_SC]/SOIL 7305.

**ENV\_SC 8500. Chemistry of the Vadose Zone. 3 Credits.**

(same as Soil Science [SOIL] 8500). Chemical reactions occurring in geomeidia with emphasis on understanding molecular scale processes occurring at the solid-water interface, aqueous geochemistry, and soil organic matter. Prerequisites: SOIL 7318 or Geology [GEOL] 7300 or instructor's consent.

**ENV\_SC 9001. Topics in Environmental Science. 1-99 Credit.**

Organized study of selected topics in environmental science. Intended for graduate students.

**ENV\_SC 9085. Problems in Environmental Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in environmental science. Graduate standing required.

**ENV\_SC 9087. Seminar in Environmental Science. 1 Credit.**

In-depth development of advanced aspects of environmental science through reviews of results of research in progress and current scientific publications.

**ENV\_SC 9090. Doctoral Research in Environmental Science. 1-10 Credit.**

Original investigations in environmental science for presentation in a dissertation. Graduate Standing required. Graded on S/U basis only.

**ENV\_SC 9407. Advanced Environmental Soil Physics. 3 Credits.**

(same as Soil Science [SOIL] 9407). Transport of mass and energy through soil with emphasis on development of the equations of flow. Evaluation of analytical and numerical solutions to differential equations describing transport phenomena. Prerequisites: SOIL 7305, Mathematics [MATH] 4100/7100, or equivalent.

**ENV\_SC 9418. Advanced Environmental Soil Chemistry. 3 Credits.**

(same as Soil Science [SOIL] 9418). Linking molecular-scale solution-phase and surface reactions with macroscopic chemical processes. Fundamentals of aqueous surface and colloid chemistry will be discussed. Prerequisites: SOIL 7318 or Geology [GEOL] 7300, and Chemistry [CHEM] 3300. Graduate Standing Required.

## Environmental Studies (ENV\_ST)

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**ENV\_ST 2070. Introduction to Ecological Economics. 3 Credits.**

(same as Agricultural Economics [AG\_EC] 2070). Examines current environmental and natural resource issues using a systems perspective and key economic concepts. Explores connections between the environment and the economy based on problems at the local, national, and international levels. Prerequisite English [ENGLSH] 1000 and sophomore standing.

**ENV\_ST 2101. Topics in Environmental Sciences. 1-3 Credit.**

Selected topics not in regularly offered courses.

**ENV\_ST 2110. Environmental Sustainability. 3 Credits.**

Students will assess availability of key resources, estimate sustainable rates of use and develop plans for aligning current and sustainable rates of use using personal, business and government strategies. Prerequisites: English [ENGLSH] 1000 and one introductory environmental course. Graded A-F only.

**ENV\_ST 2150. Directed Independent Study. 1-3 Credit.**

Working with Environmental Studies you will find and develop a research project or an internship with the university, a government agency, a business or a non-profit agency. The project will be directed towards solving an environmental problem. Prerequisite: instructor's consent.

**ENV\_ST 3000. Natural History of Missouri. 2 Credits.**

This class deals with the characteristics of natural ecological communities of Missouri and with the skills needed to observe, record and interpret those characteristics. Graded on A/F basis only. Prerequisites: Mathematics [MATH] 1100 and English [ENGLSH] 1000.

**ENV\_ST 4310. Topics in Environmental Studies. 1-3 Credit.**

This course covers topics not covered in regularly offered courses. Students are expected to combine skills, knowledge and perspectives from the natural and social science to analyze selected environmental problems.

**ENV\_ST 4350. Modeling Environmental Problems. 3 Credits.**

This course covers modeling environmental problems as systems. Modeling incorporates rates of changes, feedback loops, short/long term signals, inertia, upstream causes, interventions, implementing interventions and unintended consequences. Prerequisites: 9 hours natural science courses and junior standing. Graded on A/F basis only.

**ENV\_ST 7350. Modeling Environmental Problems. 3 Credits.**

Course covers modeling environmental problems as systems. Modeling incorporates rates of change, feedback loops, short/long term signals, inertia, upstream causes, interventions, implementing interventions, unintended consequences and predicting outcomes of major shocks (oil prices, pandemics, climate change). Prerequisites: 9 hours natural science and graduate standing. Graded on A/F basis only.

## Family And Community Medicine (F\_C\_MD)

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**F\_C\_MD 6001. Family Medicine Clerkship. 6 Credits.**

Family Medicine Clerkship.

**F\_C\_MD 6011. Rural Family Medicine Clerkship. 6 Credits.**

Rural Family Medicine Clerkship.

**F\_C\_MD 6101. Remediation 6001 Family Medicine Clerkship. 6 Credits.**

Family Medicine Clerkship remediation. Prerequisite: 6001 Family Medicine Clerkship, received unsatisfactory grade.

**F\_C\_MD 6251. ABS Evidence Based Medicine. 5 Credits.**

ABS Evidence Based Medicine.

**F\_C\_MD 6253. ABS Family and Community Medicine Research. 5-10 Credit.**

ABS Family and Community Medicine Research.

**F\_C\_MD 6255. ABS Family and Community Medicine Research and Review. 5 Credits.**

ABS Family and Community Medicine Research and Rev.

**F\_C\_MD 6475. Family Medicine Elective. 5 Credits.**

Family Medicine Elective.

**F\_C\_MD 6477. Family Medicine Elective Preceptorship. 5 Credits.**

Prerequisites: Students should have completed at least two clinical blocks, plus the Family Practice Clerkship. May be available as a rural offsite elective: contact the MU-AHEC Coordinator. Goals/Objectives: During this elective the student works closely with a family physician in private practice. Students both observe the preceptor's patient encounters and take primary responsibility for several patients each day, discussing diagnosis and formulating management plans with supervision by the preceptor. The Preceptorship also provides opportunities not available elsewhere in the medical school curriculum, including seeing the patient's illness in its context, assessing a community's health care system, and learning about practice management. Evaluations: Evaluation of the student is based on the preceptor's evaluation and comments. Notes: Site must be pre-approved by the Course Director.

**F\_C\_MD 6479. Family and Community Medicine Research. 5 Credits.**

Family and Community Medicine Research.

**F\_C\_MD 6481. Clinical Nutrition. 5 Credits.**

Clinical Nutrition.

**F\_C\_MD 6483. Preventive/Community Medicine. 5 Credits.**

Preventive/Community Medicine.

**F\_C\_MD 6485. Geriatrics-Family and Community Medicine Elective. 5 Credits.**

Prerequisites: Must have completed all core clerkships. Goals/Objectives: This is an outpatient experience in a variety of settings. Each week students will: 1. Work with Dr. David Cravens and other health care providers at Lenoir Village, Lenoir Manor, Lenoir Health Care and Maplewood Apartments. These all represent different levels and types of care available to elders. a. Students will develop an understanding of the available care and residential options that elders utilize. 2. Work with several geriatricians in the SAGE Clinic and/or Geriatrics Clinic at Green Meadows. a. Students will improve their understanding of care of elders in the outpatient setting. b. Students will also see patients undergoing geriatric assessment and thus develop a better understanding of the multidisciplinary approach to geriatric assessment. 3. Additional experiences may be arranged depending on the student's interests. 4. Participate in the various conferences related to geriatrics. Evaluations: Final evaluation will be determined by the attending physicians supervising the student during the block.

**F\_C\_MD 6486. Evidence Based Medical Writing in Family Medicine. 5 Credits.**

Student will co-author a draft of an evidence-based article under the supervision of FCM faculty with evidence-based writing experience. Before writing begins, students complete an evidence-based medicine curriculum using online modules. FCM integrated residents will also participate in a departmental editorial review session. Prerequisites: restricted to 4th year medical students.

**F\_C\_MD 6487. Family and Community Medicine Palliative Care Elective. 5 Credits.**

This is an inpatient and outpatient experience in a variety of settings that represent different levels and types of care available to people with

terminal condition. Prerequisite: Family and Community Medicine [F C MD] 6001; restricted to 4th year medical students.

**F\_C\_MD 6775. Family Medicine Preceptorship - Rural. 5 Credits.**

Family Medicine Preceptorship - Rural.

**F\_C\_MD 6776. RURAL FAMILY MED ELECT. 5 Credits.**

Rural Family Medicine Elective.

**F\_C\_MD 6875. Family Medicine Onsite Externship. 5 Credits.**

Prerequisites: Students should have completed at least two clinical blocks, plus the Family Practice Clerkship. Goals/Objectives: The student who is on the onsite track of the externship will be a member of the Family Practice Inpatient Team that is responsible for providing care to Family Practice patients in the hospital. The team consists of an attending, physician, two third-year residents, and two or three first-year residents. The student will be expected to function as a member of the team, attending rounds on a daily basis and assuming responsibility, under supervision, for the care of some of the patients. Each student will have 4-5 nights of call including weekend days. Students will be responsible for providing care, with supervision, to those patients admitted while they are on call. Students will also be expected to follow their patients after discharge, making home visits or nursing home visits and seeing them in follow-up at the clinic as indicated. Students will also have exposure to ambulatory family medicine. Each student will work closely in the clinic with one of the third-year residents assigned to the inpatient team. The student will attend each of the resident's clinics whether they are at Green Meadows, Fulton, or Fayette.

**F\_C\_MD 6876. Family Medicine Offsite Externship. 5 Credits.**

Prerequisites: Students should have completed at least two clinical blocks, plus the Family Practice Clerkship. Goals/Objectives: Several different types of experiences are available for the offsite track of the externship. Students have the opportunity to work at selected Indian Health Service sites that provide the appropriate mix of inpatient and outpatient experiences: Crownpoint, New Mexico Whiteriver, Arizona Keshena, Wisconsin It is anticipated that a number of students will fulfill the course requirements through an Indian Health Service (IHS) rotation. A list of these IHS sites and the students' evaluations are available in the course office. These offer high volume and high levels of responsibility. Planning needs to begin early in the third year. Dr. Betsy Garrett will announce a "Brown Bag Meeting" in January for third-year students to give information about this rotation. Students are required to complete an application and Dr. Garrett will make assignments after the January meeting. Not all IHS sites will meet the externship criteria. Offsite externship experiences are also available in certain community-based family practices and in certain family practice residency programs. A list of pre-approved sites is available in the course office. All of the sites available for the offsite experience have been carefully selected by the faculty based on previous experiences of fourth-year students. These sites offer an appropriate level of patient care responsibility with supervision. Offsite practices need to be approved in advance by the course director and often require planning 6 to 12 months in advance. Students considering offsite rotations will be expected to have a clear idea of how these experiences will offer unique advantages to their personal and professional development, and how they will meet the course criteria. Many offsite locations used in the past for the Family Medicine Clerkship will not satisfy the externship requirement. They still offer excellent experiences and could be taken as electives. Evaluations: Students on the offsite track will be evaluated with respect to their ability to collect, process, and analyze information, engage in clinical reasoning, and formulate appropriate diagnoses and treatment plans.

The department has had many years of experiences with the evaluation of students in offsite practices. We will build on this extensive experience to further develop a comprehensive and accurate process of evaluation. Notes: Sites must be pre-approved by the Course director.

**F\_C\_MD 6877. Rural Family Medicine Elective. 5 Credits.**  
Rural Family Medicine Elective.

**F\_C\_MD 6878. Family Medicine Maternity Care-Advanced Selective. 5 Credits.**  
Family Medicine Maternity Care-Advanced Selective.

**F\_C\_MD 7001. Topics in Family and Community Medicine. 3 Credits.**  
Selected topics of interest related to family and community medicine. Prerequisites: Understanding of research methods, statistics (basic) and graduate, post graduate or instructor' consent.

**F\_C\_MD 7300. Problems Community Health Medicine Practice. 1-3 Credit.**  
Directed exploration of community health problems. Prerequisite: instructor's consent.

**F\_C\_MD 7310. The Health Care System. 3 Credits.**  
Overview of health care system and relationship between its components. Focuses on changing nature of the system and issues confronting the future health care system. Prerequisite: instructor's consent.

**F\_C\_MD 7350. Special Readings in Community Health. 1-3 Credit.**  
Extensive reading and critical analysis of classical and current studies in selected areas of community health. Prerequisite: instructor's consent.

**F\_C\_MD 7400. Problems in Community Health. 1-3 Credit.**  
Intensive study of an area of community health. Prerequisites: graduate standing and instructor's consent.

**F\_C\_MD 7490. Research in Community Health. 1-99 Credit.**  
Independent investigation of some problem in community health to be presented as a thesis. Graded on a S/U basis only.

**F\_C\_MD 7492. Field Experience in Community Health Education. 1-99 Credit.**  
Field practice in a selected community setting under faculty or other competent supervision. Restricted to students specializing in community health education. Prerequisite: consent of community health education faculty.

**F\_C\_MD 7750. Physical Function and Older Adults. 3 Credits.**  
(Same as Architectural Studies [ARCHST] 7640, Health Management and Informatics [HMI] 7750, Human Development and Family Studies [H\_D\_FS] 7750, Nursing [NURSE] 7750, Public Health [P\_HLTH] 7750, and Social Work [SOC\_WK] 7752) This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graded A-F only. Graduate Standing Required.

**F\_C\_MD 7751. Psychosocial Function and Older Adults. 3 Credits.**  
(same as Architectural Studies [ARCHST] 7650, Health Management and Informatics [HMI] 7751, Human Development and Family Studies [H\_D\_FS] 7751, Nursing [NURSE] 7751, Public Health [P\_HLTH], 7751 and Social Work [SOC\_WK]7751). This course takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**F\_C\_MD 8330. Statistical Aspects of Public Health. 3 Credits.**  
Classification and summarization of data used in public health practice and research. Probability, sampling, hypothesis testing. Correct and incorrect use of statistics in the literature. Prerequisites: concurrent registration in Family and Community Medicine [F\_C\_MD] 8420 or instructor's consent.

**F\_C\_MD 8410. Principles and Practices in Medical Education. 3 Credits.**  
An examination of the past and present influences on the education of physicians, the application of adult education principles and the future approaches to medical education. Prerequisite: graduate standing and instructor's consent.

**F\_C\_MD 8411. Learning Strategies in Preclinical & Clinical Educ. of Physicians. 3 Credits.**  
Examination of curricular strategies in preclinical and clinical education of medical students and graduate medical education. Emphasis will be placed on different types of instructional strategies. Prerequisite: instructor's consent.

**F\_C\_MD 8420. Principles of Epidemiology. 3 Credits.**  
Examines methods of study of disease frequency and distribution in populations. Utilizes small group discussions for understanding of current medical literature. Prerequisites: instructor's consent.

**F\_C\_MD 8421. Clinical Epidemiology/Evidence Based Medicine. 3 Credits.**  
(same as Veterinary Pathobiology [V\_P BIO] 8421). Advanced epidemiologic theory and methods in the study and control of infectious and noninfectious diseases. Prerequisite: instructor's consent.

**F\_C\_MD 8422. Clinical Research Methods I. 3 Credits.**  
Principles of designing, implementing and reviewing research in the health sciences.

**F\_C\_MD 8423. Clinical Research Methods II. 3 Credits.**  
This is a continuation of the Clinical Research Methods I (CRM\_I) introductory course on the multi-method approach to clinical research. Similar to the previous course, it covers both quantitative and qualitative research methods, but includes advanced applications.

**F\_C\_MD 8430. Applications of Evidence-Based Medicine I. 3 Credits.**  
Students will participate in editing, presentation and publication of evidence-based reviews of current medical literature. Prerequisite: instructor's consent.

**F\_C\_MD 8431. Applications of Evidence-Based Medicine II. 3 Credits.**  
Students will participate in editing, presentation and publication of evidence-based reviews of current medical literature. Prerequisite: instructor's consent.

**F\_C\_MD 8450. Research in Community Health. 1-99 Credit.**  
Original research in community health not leading to a thesis but requiring a formal research report.

**F\_C\_MD 8491. Field Experience in Family and Community Medicine. 1-6 Credit.**  
Supervised teaching experience in the preclinical, clinical, and residency programs. Prerequisite: instructor's consent.

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## Film Studies (FILM\_S)

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**FILM\_S 1800. Introduction to Film Studies. 3 Credits.**

(same as English [ENGLSH] 1800). Introduction to terms and concepts for film analysis, including mise-en-scene, cinematography, editing, sound narrative, genre, and other elements. Prerequisites: Freshmen and Sophomores only or instructor's consent. No credit for students who have completed Film Studies [FILM\_S] 2810. Graded on A/F basis only.

**FILM\_S 2001. Topics in Film Studies-General. 1-3 Credit.**

Organized study of selected topics. Subject may vary from semester to semester. May be repeated with consent of instructor.

**FILM\_S 2005. Topics in Film Studies- Humanities. 1-3 Credit.**

Organized study of selected topics. Subject may vary from semester to semester. May be repeated with consent of instructor.

**FILM\_S 2010. The Philosophy of Film. 3 Credits.**

(same as Philosophy [PHIL] 2010). Philosophical problems having to do with film. Topic may include the nature of films, the differences between fiction and documentary film, ethical issues with film and filmmaking.

**FILM\_S 2520. Introduction to Film Production. 3 Credits.**

Provides a comprehensive overview of pre-production and production involved in the development of a film. Students will receive hands-on experience in lighting design, camera operation, grip and electrical, producing, directing, sound capture and design, and fundraising. Students will ultimately be responsible for the production of a commercially viable, competition grade short film at the end of the semester. Some outside class commitments are required. Prerequisite: Film Studies [FILM\_S]/ English [ENGLSH] 1800.

**FILM\_S 2820. Trends in World Cinema. 3 Credits.**

(same as German [GERMAN] 2820 and Romance Languages [RM\_LAN] 2820). This course is a historical overview of the major trends in international cinema. It focuses on the intersection of aesthetics, industry, and ideological and social concerns in cinematic production. Prerequisite: Sophomore standing, English [ENGLSH] / Film Studies [FILM\_S] 1800 or instructor's consent.

**FILM\_S 2830. American Film History I, 1895-1950. 3 Credits.**

(same as English [ENGLSH] 2830). Examines the development of American cinema in relation to other national cinemas, from 1895-1950. No credit for students who have completed English [ENGLSH]/Film Studies [FILM\_S] 1810. Prerequisite: English [ENGLSH] 1000, English [ENGLSH]/Film Studies [FILM\_S] 1800.

**FILM\_S 2840. American Film History II, 1950-Present. 3 Credits.**

(same as English [ENGLSH] 2840). Examines American film history in an international context, from 1950-present. No credit for students who have completed English [ENGLSH]/Film Studies [FILM\_S] 1820. Prerequisite: English [ENGLSH] 1000 and English [ENGLSH]/Film Studies [FILM\_S] 1800.

**FILM\_S 2850. Italian Cinema. 3 Credits.**

(same as Italian [ITAL] 2850). A course which concentrates on the development of Italian Cinema, primarily since the Post-WWII era, and the ways in which it reflects major economic, social and political events occurring in Italy. No knowledge of Italian required. Prerequisite: Sophomore standing.

**FILM\_S 2860. Film Themes and Genres. 3 Credits.**

(same as English [ENGLSH] 2860) Topics (e.g. Film noir, African-American filmmakers, Food and Film, The Western) announced at time of registration. No more than six hours may be taken in Film Themes and Genres 2680. Prerequisite: English [ENGLSH] 1000 and English [ENGLSH] / Film Studies [FILM\_S] 1800.

**FILM\_S 2865. The Art of Soviet and Russian Cinema. 3 Credits.**

(Same as Russian [RUSS] 2865) Topics (e.g. Distorted Picture: Post-War Cinema in a Soviet State, Cinema in the Soviet Times and Beyond, etc.) announced at time of registration. Only 6 hours may be taken toward major.

**FILM\_S 2870. Film and Literature. 3 Credits.**

(same as English [ENGLSH] 2870). Explores the complex interplay between film and literature in order to gain an understanding of the possibilities - and problems - involved in the transposition from literature to film. Prerequisites: English [ENGLSH] 1000 and English [ENGLSH]/ Film Studies [FILM\_S] 1800. Graded on A/F basis only.

**FILM\_S 3001. Topics in Film- General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Sophomore standing or instructor's consent.

**FILM\_S 3005. Topics in Film Studies - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Sophomore standing or instructor's consent.

**FILM\_S 3775. The Ancient World on Film. 3 Credits.**

(Same as Classical Humanities [CL\_HUM] 3775 and Art History and Archaeology [AR\_H\_A] 3775) This course explores how classical antiquity has been represented in twentieth and twenty-first-century film, with particular emphasis on the ways in which ancient narratives and iconography have been appropriated by filmmakers to address contemporary cultural issues. Prerequisite: Prior 2000 level coursework in CL\_HUM, AR\_H\_A, or FILM\_S. Instructors consent required.

**FILM\_S 3780. Architecture in Film. 3 Credits.**

(same as Art History and Archaeology [AR\_H\_A] 3780) Filmmakers use architecture to convey meaning on symbolic, psychological, and ideological levels. Using architectural history and theory, in conjunction with weekly film screenings from a variety of genres, this course explores how architecture operates within film.

**FILM\_S 3785. Art and Artists on Film. 3 Credits.**

(same as Art History and Archaeology [AR\_H\_A] 3785) This course explores representations of art and artists in film, including documentary films, fictionalized films, and films made by artists.

**FILM\_S 3820. Major Directors. 3 Credits.**

(same as English [ENGLSH] and Romance Languages [RM\_LAN] 3820). Topics (e.g. Hitchcock, Kubrick, Fellini, Allen, Kurosawa, Wilder) announced at time of registration. Only 6 hours may be taken for credit toward major. Prerequisites: English [ENGLSH] 1000 and English [ENGLSH]/Film Studies [FILM\_S] 1800. Graded on A/F basis only.

**FILM\_S 3830. History of German Film. 3 Credits.**

(same as German [GERMAN] 3830). Introduction to the development of the German film. Old and recent films are viewed and discussed in terms of techniques, artistry, psychology and social impact. English dubbing or subtitles. No foreign language credit. Prerequisites: Sophomore standing or instructor's consent.

**FILM\_S 3840. German Film After 1945. 3 Credits.**

(same as German [GERMAN] 3840). Examines a selection of post-War films by German directors, as well as historical, literary, and theoretical texts. Prerequisite: Sophomore standing, or instructor's consent.

**FILM\_S 3845. Modern Israeli Film. 3 Credits.**

(same as Hebrew [HEBREW] 3845). Examines the modern film of developing Israel. Discusses complex social relationships. Introduces

concepts of Hebrew language and its use in the arts world-wide. Discusses varied communities in Israel, and universal themes such as democracy and social justice. Provides introduction to Israeli culture. Prerequisite: Sophomore standing or consent of instructor required.

**FILM\_S 3850. Studies in Film History. 3 Credits.**

(same as English [ENGLSH] 3850). Topics (e.g. Classical Period of Hollywood cinema, silent era, Post-WWII American film, German Weimar cinema, French New Wave) announced at time of registration. Only 6 hours count as credit toward major. Prerequisites: English [ENGLSH] 1000 and English [ENGLSH]/Film Studies [FILM\_S] 1800.

**FILM\_S 3855. Documentary Film. 3 Credits.**

(same as English [ENGLSH] 3855). Surveys the history of documentary film including the development of subgenres, sound and voice over in documentary, re-enactment, ethical issues in documentary film production, and more. Graded on A/F basis only. Prerequisite: English [ENGLSH] 1000.

**FILM\_S 3861. Film Themes and Genres. 3 Credits.**

Topics (e.g. Film noir, African-American filmmakers, Food and Film, The Western) announced at time of registration. No more than six hours may be taken in Film Themes and Genres 3861. Prerequisite: English [ENGLSH] 1000 and ENGLSH/Film Studies [FILM\_S] 1800.

**FILM\_S 3865. The Holocaust on Screen. 3 Credits.**

(same as German [GERMAN] 3865). This course explores how the Holocaust has been depicted on film in a variety of national and historical contexts. Drawing on films from 1945 to the present, from the U.S., Germany, Poland, France, and Italy, we will consider to what end images of the Holocaust have been used. Prerequisites: Sophomore standing. Graded on A/F basis only.

**FILM\_S 3870. Russian Women and Film. 3 Credits.**

(same as Russian [RUSS] 3870 Women and Gender Studies [WGST] 3870) Traces image(s) of the Russian woman in 20th-century Russia as constructed in Russian, Soviet and late-Soviet film. Discusses heroines of pre-revolutionary melodrama and "new Soviet man and woman" of the 20s. Considers war-time re-alignment of gender roles in defense of motherland and their subtle revamping in post-war and post-Stalinist period, and the shifting relations between women and men, women and women, and women and the State. Emphasizes cultural-historical and ideological status of women as reflected in onscreen image(s) in Russian film. Designed to serve as an introduction to film studies and to 20th-century Russian culture more generally. Conducted in English (all films have English subtitles). Prerequisite: Sophomore standing or instructor's consent.

**FILM\_S 3875. Brazilian Cinema. 3 Credits.**

(same as Portuguese [PORT] 3875). An introduction to Brazilian cinema, culture, and society through the study of contemporary cinematic productions. Topics include: Hollywood perceptions of Brazil; redefinition of national identity and history, representations of race and gender. Prerequisite: English [ENGLSH] 1000.

**FILM\_S 3880. Contemporary Chinese Film. 3 Credits.**

(same as Chinese [CHINSE] 3880). Introduces development of 20th century Chinese film and popular genres, including review of earlier times. Explores how present day Chinese understand their own history, and issues they face in drive toward modernization in a global context. Films and readings in English or with English subtitles. No previous knowledge of the culture or language required. Prerequisite: Sophomore standing or instructor's consent.

**FILM\_S 3890. Russian and Soviet Film. 3 Credits.**

(same as Russian [RUSS] 3890). Introduces three significant genres of Russian cinema: comedy, literary adaptations, and films that explore issues of identity and autobiography. Includes examples from different epochs. Considers Soviet and post-Soviet films. Russia and Russian culture. Course conducted in English; films have English subtitles. Prerequisites: Sophomore standing or instructor's consent.

**FILM\_S 3895. Korean Society Through Cinema. 3 Credits.**

(Same as Korean [KOREAN] 3890). Examines the way in which Korean film reveals the cultural, political, and ideological orientation of the society in which it is created and circulated. Compares films from North and South Korea, considering modernity, gender, nation-hood, and class. Prerequisite: Sophomore Standing. Graded on A-F basis only.

**FILM\_S 3930. Screenwriting for Television and Film. 3 Credits.**

(same as Theatre [THEATR] 3930). Fundamentals of storytelling utilizing tools and structure used by television and film. Prerequisite: English [ENGLSH] 1000.

**FILM\_S 4001. Topics in Film-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Sophomore standing or instructor's consent.

**FILM\_S 4005. Topics in Film Studies - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing or instructor's consent.

**FILM\_S 4810. Film Theory. 3 Credits.**

(same as ENGLSH 4810). This course explores contemporary trends in film theory. Topics may include: psychoanalysis, feminism, Marxism, cultural studies, queer theory, audience and star studies, postcolonialism, among others. Prerequisite: ENGLSH 1000 and ENGLSH or FILM\_S 1800. Junior standing or above required.

**FILM\_S 4820. Studies in Film Genre. 3 Credits.**

(Same as English [ENGLSH] 4820) Topics (e.g. The Western, film noir) announced at time of registration. No more than six hours may be taken toward the major. Prerequisite: English [ENGLSH] 1000 and English/Film Studies [ENGLSH/FILM\_S] 1800; Junior Standing or instructor's consent.

**FILM\_S 4840. Culture and Media. 3 Credits.**

(Same as English [ENGLSH] 4840). Topics (e.g. Cinema and Imperialism, Indigenous Media, Ethnographic Documentary) announced at time of registration. No more than six hours may be taken for credit toward the major. Prerequisite: English [ENGLSH] 1000 and English/Film Studies [ENGLSH/FILM\_S] 1800. Junior standing or instructor's consent required.

**FILM\_S 4860. Film Themes and Genres. 3 Credits.**

Topics (e.g. Film noir, African-American filmmakers, Food and Film., The Western) announced at time of registration. No more than six hours may be taken in Film Themes and Genres 4860. Prerequisite: English [ENGLSH] 1000 and English [ENGLSH] / Film Studies [FILM\_S] 1800.

**FILM\_S 4880. Capstone Experience. 3 Credits.**

This course is for Film Studies students who have completed their concentration requirements. The main objective is to help students independently create and complete a capstone project. The project should allow you to conceptualize and enter professional life after commencement. Film Studies majors only. Consent of instructor required.

**FILM\_S 4935. Adaptation of Literature for Film. 3 Credits.**

(same as English [ENGLSH] 4935 and Theatre [THEATR] 4935). This upper-division course will explore adaptation principles and practices with a variety of forms of literature that were not originally written for film.

**FILM\_S 4940. Internship. 1-3 Credit.**

This course is for Film Studies students who have the opportunity to work in an internship position in a related industry or at a government agency where they can gain valuable on the job experience and knowledge. The student must register for the Internship course in the semester in which the work takes place. Prerequisites: English [ENGLSH] 1000, English/Film Studies [FILM\_S] 1800. Must have at least 15 hours of Films Studies credit. Online courses do not count for the 15 hours of Film Credit. Graded S/U only. Instructor consent required.

**FILM\_S 4960. Special Readings in Film Studies. 1-3 Credit.**

Arranged. Individual work with conferences adjusted to needs of student. Prerequisites: English [ENGLSH] 1000 and English [ENGLSH]/Film Studies [FILM\_S] 1800. Consent of instructor required. Restricted to Film Studies majors in their final year.

**FILM\_S 4963. Latin American Cinema (in Spanish). 2-3 Credit.**

(same as Spanish [SPAN] 4960). Subject varies according to instructor. Prerequisites: Spanish [SPAN] 3420 and 3430.

**FILM\_S 4995. Senior Honors Thesis. 1-3 Credit.**

Independent honors research under direction of faculty. Senior standing required, consent of instructor required, Honors eligibility required. Graded on S/U basis only.

**FILM\_S 7001. Topics in Film Studies-General. 1-3 Credit.**

Prerequisite: graduate standing.

**FILM\_S 7810. Film Theory. 3 Credits.**

(same as ENGLSH 7810). This course explore contemporary trends in film theory. Topics may include: psychoanalysis, feminism, Marxism, cultural studies, queer theory, audience and star studies, postcolonialism, among others. Graded on A-F basis only.

**FILM\_S 7840. Culture and Media. 3 Credits.**

(same as English [ENGLSH] 7840). Topics (e.g. Cinema and Imperialism, Indigenous Media, Ethnographic Documentary) announced at time of registration. No more than six hours may be taken for credit toward the major. Prerequisite: graduate standing.

**FILM\_S 7935. Adaptation of Literature for Film. 3 Credits.**

(same as Theatre [THEATR] 7935 and English [ENGLSH] 7935). This upper-division course will explore adaptation principles and practices with a variety of forms of literature that were not originally written for film.

**FILM\_S 7975. Distorted Picture: Post-War Cinema in a Police State. 3 Credits.**

(Same as Russian [RUSS] 7975) Considers strategies and stylistic devices employed by East European & Soviet directors to produce artistically worthy films under censorship. Discusses how artists adapted methods, boldness of expression, thematic content, and technical sophistication. Attention paid to production techniques. Graduate Standing Required.

**FILM\_S 8005. Topics in Film Studies - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisites: graduate standing or instructor's consent.

## Finance (FINANC)

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**FINANC 1000. Principles of Finance. 3 Credits.**

Financing business, consumer, and government activity; stocks, bonds, real estate, and financial markets; risk; insurance; inflation; cash and income management; capital accumulation and appreciation. Students admitted to COB upper level degree program cannot enroll.

**FINANC 2000. Survey of Business Finance. 3 Credits.**

An overview of the global financial system, financial markets, financial institutions, and principles of financial management. Students admitted to COB upper level degree program cannot enroll.

**FINANC 3000. Corporate Finance. 3 Credits.**

Financial decision-making in a corporate environment. Time value of money, capital budgeting, cost of capital, working capital management and financial instruments issued by the firm. Prerequisites: completed 45 semester hours, Accountancy [ACCTCY] 2036 and 2037, Statistics [STAT] 2500, in addition to Economics [ECONOM] 1015 or 1014 or 1024 and 1015.

**FINANC 3300. Personal Risk Management and Insurance. 3 Credits.**

Teaches the importance of risk in personal endeavors and the intelligent handling of such risk. Life, health, auto, homeowner and liability risks are treated. Prerequisite: sophomore standing.

**FINANC 4010. Financial Management. 3 Credits.**

Theory and techniques of financial management, study of firm valuation, dividend policy, capital budgeting and capital asset pricing. Prerequisite: Finance [FINANC] 3000.

**FINANC 4020. Investments. 3 Credits.**

Security valuation and analysis, formulation of personal and professional investment programs. Prerequisite: Finance [FINANC] 3000.

**FINANC 4020H. Investments - Honors. 3 Credits.**

Security valuation and analysis, formulation of personal and professional investment programs. Prerequisite: Finance [FINANC] 3000. Honors eligibility required.

**FINANC 4030. Financial Intermediaries and Markets. 3 Credits.**

Functions of intermediaries in the aggregation and allocation of funds, creation and transfer of assets, and distribution of risks. Regulation of financial institutions; financial institutions as instruments of public policy. Prerequisites: Finance [FINANC] 3000 and Economics [ECONOM] 3229.

**FINANC 4110. Financial Management Policy. 3 Credits.**

Application of the concepts and tools of finance to cases in working capital management, capital budgeting analysis and capital structure decisions. Prerequisite: senior standing and Finance [FINANC] 4010; Corequisites: Accountancy [ACCTCY] 3300.

**FINANC 4120. Security Analysis. 3 Credits.**

Classifies and analyzes securities, markets, industries. Formulation of investment policy for institutions, aggressive personal investors. Prerequisites: Finance [FINANC] 4020, senior standing.

**FINANC 4130. Management of Financial Institutions. 3 Credits.**

Operating principles of major financial intermediaries, including commercial banking, savings, insuring, lending and investing institutions. Analysis of cases; study of current problems. Prerequisite: Finance [FINANC] 4030 and senior standing. Some sections of the course may be graded on A/F or S/U graded basis only.

**FINANC 4185. Problems in Finance. 1-99 Credit.**

Independent study, reports on selected topics. Some sections of this course may be offered A-F only or S/U only.

**FINANC 4201. Topics in Finance. 3 Credits.**

Selected topics in finance, insurance or real estate. Offered on an experimental basis. Some sections of this course may be offered A-F only or S/U only.

**FINANC 4220. Portfolio Management. 3 Credits.**

Development and application of the principles of modern portfolio theory to financial assets. Analysis of the concepts of diversification, portfolio construction, portfolio revision, and use of types of financial assets in effective portfolio management. Prerequisite: Finance [FINANC] 4020 and senior standing.

**FINANC 4320. Financial Futures and Options. 3 Credits.**

A basic overview of financial futures and options markets. Topics include: theoretical pricing of financial futures contracts and stock options, institutional aspects of these markets, hedging, and speculative strategies. Prerequisites: Finance [FINANC] 4020 and senior standing.

**FINANC 4500. Principles of Real Estate. 3 Credits.**

Principle factors influencing land use, practices in real estate business. Prerequisites: Finance [FINANC] 3000, Management [MANGMT] 3540 or senior standing.

**FINANC 4510. Real Estate Appraisal. 3 Credits.**

Procedures for valuing industrial, commercial, residential realty by market, income, replacement cost approaches. Case method, field investigations. Prerequisite: Finance [FINANC] 4500 and senior standing.

**FINANC 4520. Real Estate Finance and Investment. 3 Credits.**

Financing of residential, commercial, and industrial real estate and real estate development. Instruments, institutions, and markets; role of government agencies; investment qualities of real estate. Prerequisite: Finance [FINANC] 4500 and senior standing.

**FINANC 4530. Real Estate Portfolio Analysis and REITs. 3 Credits.**

Management of real estate portfolios and analysis of real estate investment trusts including financial statement analysis, cash flows, and valuation techniques. Prerequisite: Finance [FINANC] 3000.

**FINANC 4620. Investment Strategy of Warren Buffett. 3 Credits.**

Survey and application of the investment philosophy and valuation methods of Warren Buffett. Prerequisites: Finance [FINANC] 3000; Co-requisite: Finance [FINANC] 4020.

**FINANC 4720. International Finance. 3 Credits.**

Application of domestic corporate finance to the international arena. Emphasis on international capital budgeting, working capital management, foreign exchange risk management, international capital markets, balance of payments, international monetary system, and exchange rate determination. Prerequisites: Finance [FINANC] 4010, senior standing.

**FINANC 4820. Investment Fund Management. 3 Credits.**

Analysis and management of securities and markets by participation in the management of a student-run portfolio of publicly traded stocks and bonds. Prerequisites: Finance [FINANC] 3000, 4120 or 4620, instructor's consent. May be repeated for credit.

**FINANC 4940. Professional Finance Internship. 3 Credits.**

Provides students experience with financial activities in business organizations (or, occasionally, in a governmental or not-for-profit setting). Students are required to prepare and execute a plan of study

approved by the instructor and the complete written assignments detailed in the plan. Prerequisite: Finance [FINANC] 3000, College of Business students with a finance concentration or international business students with a finance emphasis, and instructor's consent.

**FINANC 7010. Financial Management. 3 Credits.**

Theory and techniques of financial management, study of firm valuation, dividend policy, capital budgeting and capital asset pricing. Prerequisite: graduate standing and Finance [FINANC] 3000.

**FINANC 7020. Investments. 3 Credits.**

Security valuation and analysis, formulation of personal and professional investment programs. Prerequisite: Finance [FINANC] 3000.

**FINANC 7201. Special Topics in Finance. 1-3 Credit.**

Selected topics in Finance, insurance, or real estate. Offered on an experimental basis. Prerequisite: instructor's consent.

**FINANC 7210. Microeconomics for Business. 1-3 Credit.**

Examination of how the behavior of consumers and the business decisions of firms affect supply, demand, and the resulting prices of goods and services in the market.

**FINANC 7220. Economics for Managers. 1.5 Credit.**

Applies the concepts and tools of economics to management issues and problems. Prerequisite: Finance [FINANC] 7210 or equivalent.

**FINANC 7410. Managerial Finance I. 1-3 Credit.**

Introduction to financial management including the time value of money capital budgeting techniques, risk measurement, and the valuation of financial securities. Prerequisite: Accountancy [ACCTCY] 7310.

**FINANC 7420. Managerial Finance II. 1-3 Credit.**

Continuation of the study of financial management with focus on the risk-return tradeoff, capital structure, corporate layout policies, long-term financing, elementary options pricing, and mergers and acquisitions. Prerequisite: Finance [FINANC] 7410.

**FINANC 7440. Managerial Finance. 3 Credits.**

Analyzes financial information relative to acquisition, management of assets; costs of alternative financial contracts; effect of mix of outstanding securities on entity's cost of capital; interaction between funding/investment decisions. Prerequisites: Accountancy [ACCTCY] 7310 or departmental consent.

**FINANC 7620. Investment Strategy of Warren Buffett. 3 Credits.**

Survey and application of the investment philosophy and valuation methods of Warren Buffett. Prerequisites: Finance [FINANC] 3000 or 7440. Undergraduate corequisites: FINANC 4020.

**FINANC 7820. Investment Fund Management. 3 Credits.**

Analysis and management of securities and markets by participation in the management of a student-run portfolio of publicly traded stocks and bonds. May be repeated 1 time for credit. Prerequisites: Finance [FINANC] 3000 or 7440; instructor's consent.

**FINANC 8001. Topics in Finance. 1-3 Credit.**

Selected topics in finance, insurance or real estate. Offered on experimental basis. Prerequisite: instructor's consent.

**FINANC 8070. Security Markets and Investments. 3 Credits.**

Valuation of securities including stocks, bonds, options and futures; risk-return analysis of financial assets. Prerequisite: Finance [FINANC] 7440 or equivalent.

**FINANC 8085. Problems in Finance. 1-3 Credit.**

For independent investigation and analysis, graduate students select topics suggested by the foregoing undergraduate courses.

**FINANC 8320. Financial Markets. 1-3 Credit.**

Operation and structure of money markets and capital markets, including markets for stocks, bonds and derivatives securities. Study of the securities that trade in those markets including characteristics, valuation and diversification. Prerequisite: Business Administration [BUS\_AD] 7440.

**FINANC 8330. Investment Policy and Portfolio Management. 1-3 Credit.**

Study of investment policies and the effects of risk and diversification on investment management including measurement of risk, identification of investment policy, and construction and maintenance of investment portfolios. Prerequisites: Finance [FINANC] 8320.

**FINANC 8340. Derivative Financial Securities. 3 Credits.**

(same as Mathematics [MATH] 8460). Comprehensive overview of derivative securities including financial futures and options, swaps, and financial engineering. Major topics: institutional aspects of these markets, advanced pricing models, pricing relationships among derivative securities, and risk shifting. Prerequisite: Finance [FINANC] 8070.

**FINANC 8350. Financial Statement Analysis I. 1-3 Credit.**

An introduction to financial statement analysis with emphasis on interpretation and understanding of the balance sheet income statement, and statement of cash flows.. Prerequisite: Accountancy [ACCTCY] 7310.

**FINANC 8352. Financial Statement Analysis II. 1.5-3 Credit.**

Analysis of company financial statements and related accounting information with emphasis on investors' decisions to invest in the company. Prerequisite: Finance [FINANC] 8350.

**FINANC 8360. Equity Securities Analysis. 1-3 Credit.**

Theory and application of models and methods for valuing common stocks. Prerequisites: Finance [FINANC] 7420.

**FINANC 8370. Fixed-Income Securities Analysis. 1-3 Credit.**

Markets for fixed-income securities and theory and application of models for valuing bonds and other fixed-income securities. Prerequisite: Finance [FINANC] 7420.

**FINANC 8410. Advanced Financial Management. 3 Credits.**

Examination of the modern theory of finance. Capital budgeting capital structure, dividend theory and valuation. Prerequisite: Finance [FINANC] 7440.

**FINANC 8420. Working Capital Management. 3 Credits.**

Financial planning and short-term financial management; integration of quantitative techniques, microeconomics, and financial decisions; analysis of decisions about profit planning, financial forecasting, accounts receivable, cash management, and financial short-term assets. Prerequisite: Finance [FINANC] 8410.

**FINANC 8430. Capital Budgeting. 3 Credits.**

An investigation of long-term financial decisions. Topics include capital budgeting, leasing, long-term financing. Extensive use of cases. Prerequisite: Finance [FINANC] 8410.

**FINANC 8440. Financing Multinational Business. 1-3 Credit.**

Study of foreign exchange markets, currency derivatives, global capital budgeting, and international financial decision strategy. Prerequisite: Finance [FINANC] 7420. Some sections of this course may be offered on an A/F or S/U basis only.

**FINANC 8450. Ethics and Standards of Financial Practice. 1-3 Credit.**

Study of financial ethics with particular focus on standards of practice for investment performance standards. Recommended for students planning to take the CFA exam. Prerequisite: Finance [FINANC] 7420.

**FINANC 8510. Management of Financial Institutions. 3 Credits.**

Study and analysis of policies, goals, practices and organizational changes in the management of financial institutions and intermediaries. Prerequisite: Finance [FINANC] 7440.

**FINANC 8520. Real Estate Investment. 1.5-3 Credit.**

Analysis of real estate as an investment including forecasting net operating income and cap rates, risk analysis estimation of return on investment, and syndication. Prerequisite: Finance [FINANC] 7420.

**FINANC 8530. Real Estate Portfolio Analysis. 1.5-3 Credit.**

Portfolio analysis applied to real estate investment including diversification, portfolio theory, and management of real estate portfolios including real estate investment trusts (REITs). Prerequisites: Finance [FINANC] 7420.

**FINANC 8560. Real Estate Securities Analysis. 1.5-3 Credit.**

Analysis of real estate securities including in-depth financial statement analysis and valuation of real estate investment trusts (REITs) and real estate operating companies (REOCs). Prerequisites: Finance [FINANC] 8530 or instructor's consent.

**FINANC 9001. Advanced Topics in Finance. 3 Credits.**

Selected topics in finance. Prerequisite: instructor's consent.

**FINANC 9090. Research in Finance. 1-99 Credit.**

Thesis research for Ph.D. degree. Graded on a S/U basis only.

**FINANC 9100. Seminar in Corporate Finance. 3 Credits.**

Advanced theory, investigation of current research in financial management.

**FINANC 9101. Topics Seminar in Finance. 1-3 Credit.**

Reading and critical evaluation of selected current finance literature and research. Prerequisites: Ph.D. students only. Departmental consent. May be repeated. Graded on S/U basis only.

**FINANC 9200. Research in Corporate Finance. 3 Credits.**

Advanced topics in corporate finance. Prerequisite: Finance [FINANC] 9100.

**FINANC 9300. Financial Economics. 3 Credits.**

Utility analysis, efficient frontier mathematics, asset pricing and related topics. Prerequisite: instructor's consent.

**FINANC 9400. Seminar in Investment Analysis. 3 Credits.**

Develops integrated theory and analytic techniques for evaluating investment potential of financial instruments. Emphasizes corporate securities. Selected cases and readings.

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## Fisheries And Wildlife (F\_W)

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**F\_W 1002. Topics in Fisheries and Wildlife. 1-99 Credit.**

Organized study of selected topics intended primarily for lower-level students in Fisheries and Wildlife Sciences.

**F\_W 1012. Introduction to Captive Wild Animal Management. 3 Credits.**

(same as Animal Science [AN\_SCI] 1012). General introduction to housing, husbandry, behavior, genetics, nutrition, reproduction, animal health, and disease control of native and exotic species in zoological



parks and other animal conservation facilities; emphasizes the role of captive animals in wildlife conservation. Graded on A/F basis only.

**F\_W 1100. Introductory Zoology with Laboratory. 5 Credits.**

(same as Biological Sciences [BIO\_SC] 1100). Introduces important principles and concepts of zoology. Emphasizes cell biology; evolution; genetics; ecology; structure, function, development of the organism.

**F\_W 2002. Topics in Fisheries and Wildlife-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics. Intended for lower division Fisheries and Wildlife students. Subjects may vary from semester to semester.

**F\_W 2100. Colloquium in Fisheries and Wildlife. 1 Credit.**

Case studies in the biology and management of fish and wildlife and their environments. Fisheries and Wildlife majors. Graded on S/U basis only.

**F\_W 2500. Introduction to Genetics and Evolution for Conservation. 3 Credits.**

Basic principles and processes of genetics and evolution and their importance for management and conservation. Prerequisite: Natural Resources [NAT\_R] 1070, Biological Sciences [BIO\_SC] 1500, Chemistry [CHEM] 1310, Mathematics [MATH] 1100. Graded on A/F basis only.

**F\_W 2600. Ornithology. 4 Credits.**

(same as Biological Sciences [BIO\_SC] 2600). Structure, identification, habits, importance of regional birds. Field work, lectures, lab. Prerequisites: 5 hours Biological Sciences or instructor's consent.

**F\_W 2700. Ichthyology. 4 Credits.**

(same as Biological Sciences [BIO\_SC] 2700). A broad introduction to the biology and ecology of fishes. Emphasis will be placed on understanding the adaptations fishes exhibit to aspects of their environment. Prerequisite: 8 hours Biological Sciences or equivalent.

**F\_W 2900. Principles of Wildlife Management. 4 Credits.**

Expose students to the principles of wildlife management with emphasis on current issues faced by wildlife researchers and managers in the field. Prerequisite: Natural Resources [NAT\_R] 1070 and one other course in biological or environmental science; sophomore standing or higher. Graded on A/F basis only.

**F\_W 3002. Topics in Fisheries and Wildlife-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics. Intended for upper division students. Subjects and credit may vary from semester to semester.

**F\_W 3085. Problems in Fisheries and Wildlife. 1-99 Credit.**

Individual problems studies to supplement regularly organized undergraduate courses in Fisheries and Wildlife. Proposal for problems study must be arranged by student and supervising faculty member prior to registration. Prerequisite: consent of supervising faculty member.

**F\_W 3090. International Studies in Conservation. 1-5 Credit.**

International study abroad that enhances and expands conservation knowledge and experience. Prerequisites: 12 hours biological science and/or conservation-related coursework. Restricted to Fisheries and Wildlife majors only; departmental consent. Must complete a Study Abroad Proposal prior to attending the course. May be repeated for credit.

**F\_W 3200. Aquaculture. 3 Credits.**

This course aims to develop an understanding of key aspects of the practice of fish culture, an awareness of aquatic species being cultured worldwide, and an appreciation of why aquaculture is expanding so

rapidly on a global basis and the emerging environmental concerns associated with aquaculture growth. Graded on A/F basis only.

**F\_W 3300. Wildlife Damage Management. 3 Credits.**

To explore wildlife damage conflicts involving human health and safety, agricultural resources, economics and natural resources. The course studies damage caused by wildlife species and methods to alleviate damage. Covers wildlife diseases, human dimensions and wildlife policies. Graded on A/F basis only.

**F\_W 3350. Wildlife Damage Management Lab. 1 Credit.**

To explore wildlife damage management techniques in a field setting. To gain knowledge in assessing wildlife damage and the responsible species and determine the best approach to reduce that damage. Pre/Co-requisite: Fisheries and Wildlife [F\_W] 3300. Graded on A/F basis only.

**F\_W 3400. Water Quality and Natural Resource Management. 3 Credits.**

Introduction to broad aspects of water quality science, management and policy. Topics include aquatic ecology, eutrophication, lake and coastal management, water supply and treatment, watershed management with respect to agriculture and urban development, and toxicology. Prerequisite: Chemistry [CHEM] 1310 and Natural Resources [NAT\_R] 1070 or instructor's consent.

**F\_W 3500. Wildlife Conservation in British Cities. 3-6 Credit.**

Five week study abroad course focusing on approaches to wildlife conservation in London, Birmingham, Manchester, Liverpool and Edinburgh. Students will learn how managers blend ecology, conservation, and participatory approaches to management to conserve species in a human dominated landscape. Hands on involvement with conservation projects included. Prerequisites: Natural Resources [NAT\_R] 1060 or 1070, Management course in SNR; instructor's consent.

**F\_W 3600. Introduction to Conservation Biology. 3 Credits.**

Introduction to principles of conservation biology. Application of ecological concepts and conservation biology principles to management of endangered species, biodiversity and threatened ecosystems. Prerequisite: Biological Sciences [BIO\_SC] 3650.

**F\_W 3660. Mammalogy. 4 Credits.**

(same as Biological Sciences [BIO\_SC] 3660). Taxonomy, distribution, structure, habits, importance of mammals; emphasizes those of central United States. Prerequisite: junior standing or instructor's consent.

**F\_W 3700. Animal Behavior. 3 Credits.**

Behavior allows animals to react promptly to environmental changes, and is how they interact with others and their surroundings. Because behaving is central to an animal's life, knowing about behavior is fundamental to understanding animal ecology and to conservation efforts. Prerequisite: Fisheries and Wildlife [F\_W] 1100. Graded on A/F basis only.

**F\_W 3900. Ecology of Fishes. 3 Credits.**

This course considers fishes' interactions with their environments in relation to survival, growth and population processes. The course is for mid- to upper-level undergraduates interested in fisheries science, management and fish conservation. Prerequisites: Statistics [STAT] 2530 or 1400; Biological Sciences [BIO\_SC] 1500 or Fisheries and Wildlife [F\_W] 1100; sophomore standing. May be repeated once for credit. Graded on A/F basis only.

**F\_W 4002. Topics in Fisheries and Wildlife-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics intended primarily for senior-level students in Fisheries and Wildlife Sciences.

**F\_W 4100. Limnology. 3-4 Credit.**

(same as Biological Sciences [BIO\_SC] 4100). (lecture/lab: 4 hrs.; lecture only: 3 hrs.) Ecology of inland waters with emphasis on productivity. Prerequisites: senior standing or Biological Sciences [BIO\_SC] 3650.

**F\_W 4200. Urban Wildlife Conservation. 3 Credits.**

Reviewing the theory and practice of applying ecological concepts to the management of wildlife species in urban areas. Prerequisites: Biological Sciences [BIO\_SC] 3650 or instructor's consent.

**F\_W 4220. Human Dimensions of Fish and Wildlife Conservation. 3 Credits.**

Overview of human dimensions approaches and methods as they are applied to issues in fish and wildlife conservation. Prerequisite: One 3000-level or above professional Fisheries and Wildlife management or techniques course or instructor consent.

**F\_W 4300. Fisheries Management. 3 Credits.**

Introduction to the scientific principles and techniques of fishery management. Integrates ecological principles with social, economic and legal considerations. Prerequisites: Biological Sciences [BIO\_SC] 3650 and Statistics [STAT] 2530.

**F\_W 4400. Techniques for Fisheries Management and Conservation. 4 Credits.**

Introduction to techniques (field and analytical/quantitative) used by fisheries and conservation biologists. Fosters understanding of techniques uses, advantages, limitations biases, and data interpretation. Extended weekly field outings require chest waders and life jackets. Prerequisites: graduate standing and Biological Sciences [BIO\_SC] 3650 and Statistics [STAT] 2530 or Natural Resources [NAT\_R] 3110 and Fisheries and Wildlife [F\_W] 2700 or 4300. Graded on A/F basis only.

**F\_W 4500. Animal Population Dynamics and Management. 3 Credits.**

Quantitative modeling approach to examining principles and analysis techniques of fish and wildlife population dynamics. Emphasis on approaches useful in the management of exploited species. Prerequisites: Mathematics [MATH] 1400, Statistics [STAT] and Biological Sciences [BIO\_SC] 3650.

**F\_W 4600. Ecosystem Management. 4 Credits.**

Explores the development and implementation of large-scale approaches to restoring and maintaining ecosystems for sustainability. Incorporates ecological, socio-economic, and institutional factors that influence natural management agencies. Prerequisites: Biological Sciences [BIO\_SC] 3650. Graded on A/F basis only.

**F\_W 4650. Wildlife Management Planning. 3 Credits.**

Students will be exposed to various wildlife planning tools. Student teams will develop wildlife management plans with strategic and operational components for current conservation issues in Missouri. Plans will be critiqued by peers and outside professionals. Prerequisites: Biological Sciences [BIO\_SC] 3650 and senior standing. Fisheries and Wildlife [F\_W] 2900. Graded on A-F basis only.

**F\_W 4700. Wildlife Research and Management Evaluation Methods. 4 Credits.**

Techniques for conducting wildlife research and evaluating wildlife management practices. Prerequisites: Statistics, and Biological Science

[BIO\_SC] 3650 or Fisheries and Wildlife [F\_W] 2900. Course designed to prepare students for research or graduate degrees.

**F\_W 4800. Environmental Toxicology. 3 Credits.**

Introduction to classes of chemicals, tools, methods, and approaches used in environmental toxicology. Emphasizes fundamentals of toxicology, dose-response relationships, evaluation of contaminant issues, strategies, and exposure analysis/toxicity assessment strategies in a risk assessment. Prerequisites: Chemistry [CHEM] 1320 and Fisheries and Wildlife [F\_W] 3400 or instructor's consent.

**F\_W 4810. Wildlife Disease Ecology. 3 Credits.**

An introduction to the ecology of wildlife diseases. Topics include the definition of a disease, how to measure diseases, impacts on individuals and populations, and the role of disease in wildlife management and conservation. Prerequisites: for undergraduates, Biological Sciences [BIO\_SC] 3650.

**F\_W 4880. Waterfowl Ecology and Management. 3 Credits.**

Ecology and management of North American waterfowl and their habitats. Laboratory exercises focus on identification, life histories, sex and age determination, and survey methods. Lectures cover taxonomy, ecology, behavior, population dynamics, harvest management, and habitat management and conservation. Prerequisite: Fisheries and Wildlife [F\_W] 2600; Biological Sciences [BIO\_SC] 3650; instructor's consent. Graded on A/F basis only.

**F\_W 4910. Senior Seminar in Captive Wild Animal Management. 1 Credit.**

(same as Animal Science [AN\_SCI] 4910). Investigates key issues in captive wild animal management, focusing on the role of animal caretakers in addressing the issues. Students are required to formulate informed opinions regarding these topics and communicate effectively about the subject matter. Prerequisite: [AN\_SCI] / Fisheries and Wildlife [F\_W] 1012 or instructor's consent; junior or senior standing. Graded A-F only.

**F\_W 4940. Fisheries and Wildlife Internship. 1-12 Credit.**

Supervised professional experience with an approval public or private organization. Prerequisite: Fisheries and Wildlife majors only, instructor's consent. Graded on S/U basis only. May be repeated for credit.

**F\_W 4950. Undergraduate Research in Fisheries and Wildlife. 1-99 Credit.**

Individually directed field or laboratory research for students under faculty supervision. Project must be arranged by student and faculty member prior to registration. Prerequisite: consent of supervising faculty member.

**F\_W 4960. Special Readings in Fisheries and Wildlife. 1-99 Credit.**

Critical review of current literature and research in fisheries and wildlife sciences. Project must be arranged by student and faculty supervisor prior to registration. Prerequisites: supervising faculty member's consent required.

**F\_W 7002. Graduate Topics in Fisheries and Wildlife. 1-99 Credit.**

Organized study of selected topics intended primarily for graduate students in Fisheries and Wildlife Sciences. Prerequisite: graduate standing. Graded on A/F basis only.

**F\_W 7100. Limnology. 3-4 Credit.**

(same as Biological Sciences [BIO SC] 7100). (lecture/lab: 4 hrs.; lecture only: 3 hrs.) Ecology of inland waters with emphasis on productivity. Prerequisites: graduate standing or Biological Sciences [BIO SC] 3650.

**F\_W 7200. Urban Wildlife Conservation. 3 Credits.**

Reviewing the theory and practice of applying ecological concepts to the management of wildlife species in urban areas. Corequisites: graduate standing and Biological Sciences [BIO SC] 3650 or instructor's consent.

**F\_W 7220. Human Dimensions of Fish and Wildlife Conservation. 3 Credits.**

Overview of human dimensions approaches and methods as they are applied to issues in fish and wildlife conservation. Prerequisite: One 3000-level or above professional management or techniques course or instructor consent. Graduate Standing Required.

**F\_W 7300. Fisheries Management. 3 Credits.**

Introduction to the scientific principles and techniques of fishery management. Integrates ecological principles with social, economic and legal considerations. Prerequisites: graduate standing and Biological Sciences [BIO SC] 3650 and Statistics [STAT] 2530.

**F\_W 7400. Techniques for Fisheries Management and Conservation. 3 Credits.**

Introduction to techniques (field and analytical/quantitative) used by fisheries and conservation biologists. Fosters understanding of techniques uses, advantages, limitations biases, and data interpretation. Extended weekly field outings require chest waders and life jackets. Prerequisites: graduate standing and Biological Sciences [BIO SC] 3650 and Statistics [STAT] 2530 or Natural Resources [NAT R] 3110 and Fisheries and Wildlife [F W] 2700 or 4300.

**F\_W 7500. Animal Population Dynamics and Management. 3 Credits.**

Quantitative modeling approach to examining principles and analysis techniques of fish and wildlife population dynamics. Emphasis on approaches useful in the management of exploited species. Prerequisites: Mathematics [MATH] 1400, Biological Sciences [BIO SC] 3650, Statistics; graduate standing required. Graded on A/F basis only.

**F\_W 7600. Ecosystem Management. 4 Credits.**

Explores the development and implementation of large-scale approaches to restoring and maintaining ecosystems for sustainability. Incorporates ecological, social-economic, and institutional factors that influence natural resource management agencies. Prerequisite: graduate standing. Graded on A/F basis only.

**F\_W 7700. Wildlife Research and Management Techniques. 4 Credits.**

Research and Management methods for wildlife populations and habitats. Prerequisite: graduate standing and Biological Sciences [BIO SC] 3650 and Statistics [STAT] 2530 or Natural Resources [NAT R] 3110. One-week pre-semester field session required.

**F\_W 7800. Environmental Toxicology. 3 Credits.**

Introduction to classes of chemicals, tools, methods, and approaches used in environmental toxicology. Emphasizes fundamentals of toxicology, dose-response relationships, evaluation of contaminant issues, strategies, and exposure analysis/toxicity assessment strategies in a risk assessment. Prerequisite: Chemistry [CHEM] 1320 and Fisheries and Wildlife [F W] 3400 or instructor's consent.

**F\_W 7810. Wildlife Disease Ecology. 3 Credits.**

An introduction to the ecology of wildlife diseases. Topics include the definition of a disease, how to measure diseases, impacts on individuals and populations, and the role of disease in wildlife management and conservation. Prerequisite: instructor's consent.

**F\_W 7880. Waterfowl Ecology and Management. 3 Credits.**

Ecology and Management of North American waterfowl and their habitats. Laboratory exercises focuses on identification, life histories, sex and age determination, and survey methods. Lectures cover taxonomy, ecology, behavior, population dynamics, harvest management, and habitat management and conservation. Prerequisite: Fisheries and Wildlife [F W] 2600; Biological Sciences [BIO SC] 3650; instructor's consent. Graded on A/F basis only. Graduate Standing Required.

**F\_W 8001. Topics in Fisheries and Wildlife. 1-99 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester. Prerequisite: instructor's consent.

**F\_W 8050. Non-Thesis Research in Fisheries and Wildlife. 1-99 Credit.**

Independent research not leading to a thesis.

**F\_W 8085. Graduate Problems in Fisheries and Wildlife. 1-5 Credit.**

Individualized problems studies to supplement regularly organized graduate courses in Fisheries and Wildlife. Prerequisite: consent of supervising faculty member.

**F\_W 8087. Masters Seminar in Fisheries and Wildlife. 1 Credit.**

Discussions of current developments in forestry, fisheries and wildlife, and critical study of research programs.

**F\_W 8090. Masters Thesis Research in Fisheries and Wildlife. 1-99 Credit.**

Research leading to a thesis or dissertation. Graded on a S/U basis only.

**F\_W 8300. Professional Development and Communications. 1-3 Credit.**

Intended to foster professional growth and development of graduate students. The course will present a rigorous introduction to professionalism, ethics, career development, and professional communications skills and techniques. Prerequisite: graduate standing. Graded on A/F basis only.

**F\_W 8440. Fish Ecology. 3 Credits.**

Advanced study of the interactions between fish and their environment. Topics include behavioral, physiological, population and community ecology of fishes, with emphasis on development and application of ecological theory in fishery management. Prerequisites: Fisheries and Wildlife [F W] 2700, 4100, Biological Sciences [BIO SC] 3650 or equivalent.

**F\_W 8450. Advanced Limnology. 3 Credits.**

Physical, chemical and biological processes of lakes and streams emphasizing biological production, water quality and modern problems. Field, laboratory techniques in limnology research. Prerequisites: Fisheries and Wildlife [F W] 4100, Biological Sciences [BIO SC] 3650, 3510 or equivalent.

**F\_W 8460. Wetland Ecology. 3 Credits.**

A survey of the wetlands of North America; emphasis on nutrient dynamics, habitat structure, management, legislation and regulations, and man's impacts. Prerequisites: Fisheries and Wildlife [F W] 4100, Biological Sciences [BIO SC] 3650 and instructor's consent.

**F\_W 8470. Fish Bioenergetics: Concepts and Applications. 2 Credits.**

Key concepts of fish bioenergetics are treated by readings, discussions of articles and lectures by the instructor. Concepts are applied through modeling. Novel applications, shortcomings and benefits of bioenergetics models are treated. The course applies to graduate students seeking careers in fisheries management, aquatic ecology, fish conservation

and aquaculture. Prerequisites: graduate standing; instructor's consent. Graded on A/F basis only.

**F\_W 8510. Ecology, Conservation, and Environmental Justice. 2 Credits.**

The goal of this course is to introduce graduate students in natural resource management and conservation biology to the ecological and management concepts that underlie environmental justice issues, and to explain how broader environmental justice concepts are relevant to natural resource and conservation fields. Prerequisite: one undergraduate course from the following list of disciplines: ecology, natural resource management, conservation biology, sociology or equivalent. Graded on A/F basis only.

**F\_W 8520. Stream Ecology. 3 Credits.**

Ecological principles applied to flowing waters. Emphasis on ecological processes within algal, invertebrate and fish communities. The influence of geomorphic processes, hydrologic principles and physical-chemical factors on the biota.

**F\_W 8530. Quantitative Fish and Wildlife Assessment. 4 Credits.**

Methods to assess space use patterns, animal abundance and population status are drawn into quantitative framework for making inferences to wild populations. Practical application and limitations of techniques are emphasized through analysis and interpretation of field data. Prerequisite: Natural Resources [NAT R] 3110 or equivalent.

**F\_W 8540. Wildlife Nutritional Ecology. 3 Credits.**

A comprehensive and comparative treatment of vertebrates interact with their environment to satisfy nutrient and energy requirements. Emphasis on nutrient requirements, food processing, bioenergetics and foraging strategies. Prerequisite: Biological Sciences [BIO SC] 3650 or instructor's consent.

**F\_W 8550. Advanced Waterfowl Ecology. 3 Credits.**

Advance studies of waterfowl ecology. Emphasis on mating systems, foraging ecology, energetics, and post-breeding and wintering ecology. Prerequisites: Fisheries and Wildlife [F W] 2600, 3800 and Biological Sciences [BIO SC] 3650 or instructor's consent.

**F\_W 8620. Vertebrate Behavioral Ecology. 3 Credits.**

In-depth study of the behavioral adaptations of vertebrates. Topics include reproductive strategies, mate selection, parental care, predator avoidance, habitat selection, foraging strategies and spacing patterns. Prerequisites: Biological Sciences [BIO SC] 4640 and 3650 or equivalents.

**F\_W 9087. PhD Seminar in Fisheries and Wildlife. 1 Credit.**

Discussions of current developments in forestry, fisheries and wildlife, and critical study of research programs.

**F\_W 9090. Ph. D. Dissertation Research in Fisheries and Wildlife. 1-99 Credit.**

Research leading to a thesis or dissertation. Graded on a S/U basis only.

## **Food Science (F\_S)**

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**F\_S 1010. Introduction to Viticulture and Enology. 1 Credit.**

This course will give a general overview of growing grapes (viticulture) and winemaking (enology) with an emphasis on Missouri wines and wineries. This course is the first course in a sequence of courses in the viticulture and enology track of the food science degree program.

**F\_S 1030. Food Science and Nutrition. 3 Credits.**

Basic principles of science and technology as applied to the problem of providing safe, nutritious, and desirable food for man.

**F\_S 2114. Live Animal and Meat Evaluation. 3 Credits.**

(same as AN\_SCI 2114). The composition and quality meat produced from food animals is the driving component of livestock economic value. This course will teach the principles and procedures involved in evaluation, grading, selection, and economic value of meat animals and poultry and the carcasses they produce. This course is an excellent introduction and (or) prerequisite for all livestock production courses and will provide a baseline of information for students interested in livestock or meat judging.

**F\_S 2131. Dairy Products Evaluation. 2 Credits.**

(same as AN\_SCI 2131). Sensory Evaluation and judging of dairy products.

**F\_S 2172. Elements of Food Microbiology. 3 Credits.**

Basic course stressing principles of microbiology applied to foods.

**F\_S 2195. Grapes and Wines of the World. 3 Credits.**

(same as PLNT\_S 2195). Explores the world of wine through study of viticultural principles and practices, wine styles, classifying wine, the winemaking process and New World and Old World wine regions. Learn wine tasting skills and experience wines from around the world. World wine consumption, social and physical health benefits of moderate wine consumption.

**F\_S 2199. Seminar in Professional Development. 1 Credit.**

Readings and discussion related to professional development for the industry. Prerequisites: sophomore standing.

**F\_S 3190. Study Abroad: International Meat, Dairy and Enology. 3 Credits.**

(same as AN\_SCI 3190). This study abroad course introduces students to the meat, dairy and wine industries in Germany or in New Zealand (destinations are on a rotational basis). Students will visit small, medium and large-scale producers and learn about differences in comparison to the US industries. May be repeated once for credit. Prerequisite: instructor's consent.

**F\_S 3214. Principles of Meat Science. 3 Credits.**

(same as AN\_SCI 3214). Study of the principles involved in the conversion of living animals to meat and by-products; efficient utilization of meat as a food. Prerequisite: one course in Biological Sciences.

**F\_S 3231. Principles of Dairy Foods Science. 3 Credits.**

(same as AN\_SCI 3231). Technology, chemistry and microbiology related to milk and its transformation into fluid milk products, fermented dairy foods and spreads. (2 hours of lecture and two hours of laboratory per week.) Prerequisite: One course in Chemistry or Biological Sciences.

**F\_S 3240. Principles of Viticulture I. 4 Credits.**

(same as PLNT\_S 3240). Grapevine growth, development, selection, propagation, training systems pruning, and harvesting; vineyard site selection, design, and development. Graded on A/F basis only. Prerequisites: F\_S 1010 and F\_S 2195/PLNT\_S 2195 or PLNT\_S 2100 or PLNT\_S 2110 or PLNT\_S 2125.

**F\_S 3250. Physical Principles for Food Processing. 3 Credits.**

Introduction to basic engineering concepts used to process raw materials: Energy balance, Pipe flow, Viscosity, Heat exchange, Refrigeration. Prerequisites: one calculus course and one physics course.

**F\_S 3385. Problems in Food Science. 1-99 Credit.**

Supervised study in a specialized phase of food science and nutrition.

**F\_S 4199. Food Industry Senior Seminar. 1 Credit.**

The course explores the structure and the various branches of the food industry. Emphasis is placed on industry trends and the manufacture of specific selected food products and their ingredients. Prerequisite: F\_S 1030 or equivalent, F\_S 2199 or equivalent; junior or senior standing. Graded on A/F basis only.

**F\_S 4301. Topics in Food Science. 1-99 Credit.**

Instruction in specific subject matter areas in the field of food science and nutrition.

**F\_S 4310. Food Chemistry and Analysis. 4 Credits.**

Structure, composition and chemical properties of food. Prerequisite: 5 hours Chemistry or Biochemistry.

**F\_S 4311. Investigation of Food Properties. 3 Credits.**

Study of the chemical and physical properties of foods and the interaction of food components. Prerequisites: Food Science F\_S 4310 or equivalent, or instructor's consent.

**F\_S 4315. Food Chemistry and Analysis Laboratory. 3 Credits.**

The quantitative determination of the constituents of food. Prerequisites: F\_S 4310 or concurrent enrollment.

**F\_S 4330. Principles of Food Processing. 4 Credits.**

Basic principles of food processing, with emphasis on blanching, pasteurization, commercial sterilization, refrigeration, freezing, concentration, dehydration and packing. Impacts of processing on product quality are evaluated.

**F\_S 4331. Technology of Dairy Products and Ingredients. 3 Credits.**

Technology, chemistry, and nutrition of dairy foods as well as functional properties of dairy ingredients. Prerequisites: one Chemistry course and F\_S 3231 or equivalent.

**F\_S 4340. Principles of Viticulture II. 4 Credits.**

(same as PLNT\_S 4340). Environmental and biological factors influencing vine physiology and winegrape quality. Irrigation, canopy management, pest and disease control, budgets and current trends in viticulture. Graded on A/F basis only. Prerequisite: F\_S 3240/PLNT\_S 3240.

**F\_S 4344. Processing Muscle Foods. 3 Credits.**

(same as AN\_SCI 4344). Materials and technologies for the manufacture of muscle food products from red meats, poultry and seafood. Experience problem-solving through further processing of complex ingredients and develop skills by practicing operations in a pilot plant facility. Prerequisites: One Chemistry course.

**F\_S 4354. Physiology and Biochemistry of Muscle as Food. 3 Credits.**

(same as AN\_SCI 4354). Basic concepts in muscle growth and development of livestock evaluating the effects of environment, welfare, nutrition and genetics regarding muscle metabolism, physiology, and the ultimate condition of muscle as food. Prerequisite: BIO\_SC 1010 or equivalent or F\_S 3214 or instructor's consent.

**F\_S 4370. Food Microbiology. 3 Credits.**

Study of bacteria, yeast and molds. Includes dominant flora, public health significance, characterization of organisms, examination of foods representative of major food groups, spoilage, preservation, food fermentations and physiological groups. Prerequisites: Food Science [F\_S] 2172 and one Biochemistry course or concurrent enrollment.

**F\_S 4375. Food Microbiology Laboratory. 2 Credits.**

Examination of foods for microorganisms and characterization of major species. Prerequisite: F\_S 4370 or concurrent enrollment.

**F\_S 4380. Sensory Analysis of Food and Beverages. 3 Credits.**

Methodological principles of the sensory analysis of food and beverages with an emphasis on wine analysis. Recommended: one statistics course.

**F\_S 4385. Problems in Food Science. 1-99 Credit.**

Advanced problems in a selected field of food science and nutrition.

**F\_S 4390. Optimization and Management of Food and Agricultural Systems. 3 Credits.**

(same as AG\_S\_M and HSP\_MGMT 4390). This course is designed to introduce the student to the concept of layers and interacting systems within an operation and the analytical methods of modeling and simulation to make effective management decisions for optimal system design and function. Prerequisite: MATH 1100.

**F\_S 4440. Principles of Winemaking and Wine Chemical Analysis. 4 Credits.**

The theoretical and practical basics needed by enologists/winemakers including sensory analysis of grapes; chemical, microbiological and technological aspects of winemaking; and the analytical methods used for juice and wine analysis. Prerequisites: 5 credit hours inorganic chemistry and organic chemistry or concurrent, or instructors consent. Graded on A/F basis only.

**F\_S 4441. Cellar Operations and Special Vinifications. 3 Credits.**

The theoretical and practical basics needed by winemakers to supervise the operations of the winemaking, wine stabilization and packaging equipment. The theoretical and practical basics needed by winemakers to make special wines including rose, dessert, carbonic maceration, and sparkling wines. Prerequisite: 5 credit hours inorganic chemistry and organic chemistry and F\_S 4440 or instructor's consent. Graded on A/F basis only.

**F\_S 4940. Field Training. 1-99 Credit.**

Prerequisites: junior or senior standing and instructor's consent.

**F\_S 4941. Internship in Food Science. 1-6 Credit.**

Combines study, observation and employment in an area of food science and nutrition. Written reports, faculty evaluation. Prerequisites: one Food Science course and instructor's consent.

**F\_S 4970. Food Product Development. 3 Credits.**

Capstone course integrating the various disciplines of food science to create new food products. Prerequisites: ENGLSH 1000 and instructor's consent.

**F\_S 4980. Food Quality Assurance. 3 Credits.**

Capstone course integrating various food science disciplines to comply with regulations concerned with protection of the nation's food supply. Applies practices to insure consumers of healthful foods. Prerequisites: English ENGLSH 1000, senior standing and instructor's consent.

**F\_S 7310. Food Chemistry and Analysis. 4 Credits.**

Structure, composition and chemical properties of food. Prerequisite: graduate standing and 5 hours Chemistry or Biochemistry.

**F\_S 7311. Investigation of Food Properties. 3 Credits.**

Study of the chemical and physical properties of foods and the interaction of food components. Lecture. Prerequisites: graduate standing and F\_S 4310 or F\_S 7310 or equivalent, or instructor's consent.

**F\_S 7314. Processing Muscle Foods. 3 Credits.**

Materials and technologies for the manufacture of muscle food products from red meats, poultry and seafood. Experience problem-solving through further processing of complex ingredients and develop skills by practicing operations in a pilot plant facility. Prerequisites: graduate standing and one Chemistry course and Food Science [F S] 3214.

**F\_S 7315. Food Chemistry and Analysis Laboratory. 3 Credits.**

The quantitative determination of the constituents of food. Prerequisites: graduate standing and F\_S 4310 or concurrent enrollment.

**F\_S 7330. Principles of Food Processing. 4 Credits.**

Basic principles of food processing, with emphasis on blanching, pasteurization, commercial sterilization, refrigeration, freezing, concentration, dehydration and packing. Impacts of processing on product quality are evaluated. Prerequisite: graduate standing.

**F\_S 7331. Technology of Dairy Products and Ingredients. 3 Credits.**

Technology, chemistry, and nutrition of dairy foods as well as functional properties of dairy ingredients. Prerequisites: one Chemistry course and F\_S 3231 or equivalent.

**F\_S 7354. Physiology and Biochemistry of Muscle as Food. 3 Credits.**

(same as AN\_SCI 7354). Basic concepts in muscle growth and development of livestock evaluating the effects of environment, welfare, nutrition and genetics regarding muscle metabolism, physiology, and the ultimate condition of muscle as food. Prerequisite: graduate standing and BIO\_SC 1010 or equivalent or F\_S 3214 or instructor's consent.

**F\_S 7360. Food Quality Assurance. 3 Credits.**

Interprets regulations concerned with protection of the nation's food supply. Applies protection and sanitary practices to insure consumers of wholesome and healthful foods. Prerequisite: graduate standing and Microbiology.

**F\_S 7370. Food Microbiology. 3 Credits.**

Study of bacteria, yeast and molds. Includes dominant flora, public health significance, characterization of organisms, examination of foods representative of major food groups, spoilage, preservation, food fermentations and physiological groups. Prerequisites: graduate standing and Food Science F\_S 2172 and one Biochemistry course or concurrent enrollment.

**F\_S 7375. Food Microbiology Laboratory. 2 Credits.**

Examination of foods for microorganisms and characterization of major species. Prerequisite: graduate standing and F\_S 4370 or concurrent enrollment.

**F\_S 7380. Sensory Analysis of Food and Beverages. 3 Credits.**

Methodological principles of the sensory analysis of food and beverages with an emphasis on wine analysis. Recommended: one statistics course.

**F\_S 7390. Optimization and Management of Food and Agriculture Systems. 3 Credits.**

(same as AG\_S\_M 7390 and HSP\_MGMT 7390). This course is designed to introduce the student to the concept of layers and interacting systems within an operation and the analytical methods of modeling and simulation to make effective management decisions for optimal system design and function. Prerequisite: graduate standing; instructor's consent.

**F\_S 7440. Principles of Winemaking and Wine Chemical Analysis. 4 Credits.**

The theoretical and practical basics needed by enologist/winemakers including sensory analysis of grapes; chemical, microbiological and technological aspects of winemaking; and the analytical methods used for

juice and wine analysis. Prerequisites: 5 hours inorganic chemistry and organic chemistry or concurrent, or instructor's consent. Graded on A/F basis only.

**F\_S 7441. Cellar Operations and Special Vinifications. 3 Credits.**

The theoretical and practical basics needed by winemakers to supervise the operations of the winemaking, wine stabilization and packaging equipment. The theoretical and practical basics needed by winemakers to make special wines including rose, dessert, carbonic maceration, and sparkling wines. Prerequisite: 5 credit hours inorganic chemistry and organic chemistry and F\_S 4440 or instructor's consent. Graded on A/F basis only. Graduate Standing Required.

**F\_S 7941. Internship in Food Science. 1-6 Credit.**

Combines study, observation and employment in an area of food science and nutrition. Written reports, faculty evaluation. Prerequisites: graduate standing and one Food Science course and instructor's consent.

**F\_S 7970. Food Product Development. 3 Credits.**

Capstone course integrating the various disciplines of food science to create new food products. Prerequisites: graduate standing and ENGLISH 1000, and instructor's consent.

**F\_S 8050. Non-Thesis Research in Food Science. 1-99 Credit.**

Original investigations, usually in connection with one of the research projects of Agricultural Experiment Station. Written report required.

**F\_S 8085. Problems in Food Science. 1-99 Credit.**

Individual studies include a minor research problems. Prerequisite: Masters standing.

**F\_S 8087. Seminar in Food Science. 1 Credit.**

Provides students with opportunities for development in depth of advanced aspects of food science through reviews of research in progress and of current scientific publications. Prerequisite: Masters standing.

**F\_S 8090. Research in Food Science. 1-99 Credit.**

Original investigations, usually in connection with one of the research projects of Agricultural Experiment Station. Written report required. Prerequisite: Masters standing. Graded on S/U basis only.

**F\_S 8253. Strategic Human Resource Management in Hospitality. 3 Credits.**

This course is designed to help graduate students pursuing a managerial position in the Hospitality Industry to understand the value and the competitive advantage that strategic human resource management provide. Prerequisites: HSP\_MGMT 4253 or equivalent and instructors consent.

**F\_S 8263. Service Operations Management: Revenue Management. 3 Credits.**

This course offers an opportunity for students to learn the theory, concepts, and knowledge applied in service operations management. Students will find them useful in trying to cope with the dilemmas faced by operating managers in the hospitality industry. Especially, the course focuses on revenue management. Prerequisite: HSP\_MGMT 3153 or instructor's consent. Graduate standing required.

**F\_S 8273. Advanced Hospitality Marketing. 3 Credits.**

This course provides students with an advanced-level view of marketing strategies in the hospitality. The course encompasses analytical readings on segmentation and positioning, relationship marketing, marketing-mix development, and other strategic approaches applicable to hospitality industries. Prerequisites: HSP\_MGMT4273 or equivalent and instructors consent.

**F\_S 8401. Topics in Food Science. 1-99 Credit.**

Specialized topics in the area of food science and nutrition. Prerequisites: graduate standing and instructor's consent.

**F\_S 8402. Research Methods in Food Science. 2 Credits.**

(same as BIOL\_EN 8402). Introduction to research. Defining research problems, developing hypotheses, searching scientific literature, designing experiments, presenting data, writing scientific papers and theses, making oral presentations. Prerequisite: graduate standing.

**F\_S 8404. Advanced Food Microbiology and Biotechnology. 2 Credits.**

Covers basic principles in biotechnology and applied food microbiology, including current topics of interest in food biotechnology. May be repeated for credit. Prerequisite: graduate standing. Graded on A/F basis only.

**F\_S 8405. Advanced Microbiology of Foods. 3 Credits.**

Principles of microbial physiology, taxonomy, analytical methods applied to study of microorganisms added to foods and those causing food spoilage or food-borne illness. Roles of microorganisms in manufacture/distribution of foods. Prerequisite: F\_S 4370 or equivalent.

**F\_S 8410. Food Chemistry II. 4 Credits.**

Study of chemical content of food, emphasizing aspects that exist uniquely in food. Prerequisite: F\_S 4310 or equivalent.

**F\_S 8414. Meat Quality. 3 Credits.**

(same as AN\_SCI 8414). Discussion of factors affecting meat quality in beef, pork, lamb and poultry. Prerequisites: F\_S 3214 or equivalent. Graded on A/F basis only.

**F\_S 8419. Field Training in Food Science. 1-99 Credit.**

Internships and/or field experiences under supervision. Prerequisites: graduate standing and instructor's consent.

**F\_S 8424. Meat Investigations. 3 Credits.**

(same as AN\_SCI 8424). Discussion of literature, special reports, assigned readings, techniques, interpretation of results. Prerequisites: F\_S 4344 and F\_S 4310 or equivalent.

**F\_S 8440. Functional Foods and Nutraceuticals. 3 Credits.**

Principles and challenges involved in developing foods with health benefits beyond basic nutrition; efficacy, safety, regulatory and marketing aspects of functional foods and nutraceutical; current controversies and evidence of therapeutic properties of functional foods and Dietary supplements. Prerequisites: BIOCHM 3630 or equivalent and F\_S 4310 or equivalent, or instructor's consent. Graduate standing required. Graded on A/F basis only.

**F\_S 9085. Problems in Food Science. 1-99 Credit.**

Individual studies includes minor research problems. Prerequisite: PhD standing.

**F\_S 9087. Seminar in Food Science. 1 Credit.**

Provides students with opportunities for development in depth of advanced aspects of food science through reviews of research in progress and of current scientific publications. Prerequisite: PhD standing.

**F\_S 9090. Research in Foods Science. 1-99 Credit.**

Original investigation of advanced nature, leading to dissertation. Prerequisite: PhD standing. Graded on a S/U basis only.

**F\_S 9460. Advanced Food Quality Assurance. 3 Credits.**

Analyzes concepts of integrating laws, TQM and statistical process control into HACCP and ISO systems required for the quality of the global food industry. Prerequisites: F\_S 4980 or equivalent and one Statistics course.

**F\_S 9470. Advanced Food Technology. 3 Credits.**

To understand the physical and chemical changes that occur during the processing and storage of food; study the quality and safety issues of foods and learn traditional and recent advances in food science and technology. Prerequisite: F\_S 4310, or equivalent or instructor's consent.

## Forestry (FOREST)

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**FOREST 1102. Topics in Forestry - Biological/Physical/Mathematical. 1-3 Credit.**

Organized study of selected topics in forestry. Intended for undergraduate students.

**FOREST 1104. Topics in Forestry - Social Science. 1-3 Credit.**

Organized study of selected topics in forestry. Intended for undergraduate students.

**FOREST 2151. Dendrology. 4 Credits.**

An introduction to the biology of trees, emphasizing identification in the field, taxonomy, ecology, geographic distribution and economic significance of forest species. Prerequisites: Biological Sciences [BIO\_SC] 1200 or Plant Science [PLNT\_S] 2120 and 3130 or instructor's consent.

**FOREST 2540. Forest Hydrology Field Studies. 1 Credit.**

Introduction to forest hydrology, watershed management, water quantity and quality, climate and biophysical relationships. Prerequisites: Soils [SOIL] 2100, Forestry [FOREST] 2151 and Forestry [FOREST] 2541, 2542, 2543, 2544 and 2545 concurrently.

**FOREST 2541. Forest Utilization. 1 Credit.**

Field studies of logging and milling of timber. Prerequisites: Soils [SOIL] 2100, Forestry [FOREST] 2151 and Forestry [FOREST] 2540, 2542, 2543, 2544 and 2545 concurrently.

**FOREST 2542. Forest Measurement and Inventory. 1 Credit.**

Field measurement of standing trees including diameter, height and age. Estimation of forest timber resources using a variety of sampling schemes and techniques. Introduction to Arcview and growth models. Prerequisites: Soils [SOIL] 2100, Forestry [FOREST] 2151 and Forestry [FOREST] 2540, 2541, 2543, 2544 and 2545 concurrently.

**FOREST 2543. Forest Ecology Field Studies. 1 Credit.**

Field studies of vegetation, soils, habitats and ecological units. Application of ecological principles of natural resource management and understanding of natural and managed forested communities with an emphasis on southeastern Missouri. Prerequisites: Soils [SOIL] 2100, Forestry [FOREST] 2151 and Forestry [FOREST] 2540, 2541, 2542, 2544 and 2545 concurrently.

**FOREST 2544. Introduction to Silviculture and Management. 1 Credit.**

Management objectives and stand prescriptions, regeneration and intermediate silvicultural treatments, management on private and federal forest lands, tree evaluation and timber marking. Prerequisites: Soils [SOIL] 2100, Forestry [FOREST] 2151 and Forestry [FOREST] 2540, 2541, 2542, 2543 and 2545 concurrently.

**FOREST 2545. Forest Management Planning. 1 Credit.**

Preparation and presentation of a written forest management plan using material and data developed in prerequisite courses. Prerequisites: Soils [SOIL] 2100, Forestry [FOREST] 2151 and Forestry [FOREST] 2540, 2541, 2542, 2543 and 2544 concurrently.

**FOREST 3201. Topics in Forestry. 1-99 Credit.**

Organized study of selected topics. Intended primarily for undergraduate Forestry students. Subjects and credit may vary from semester to semester.

**FOREST 3207. Forest Fire Control and Use. 2 Credits.**

Fundamentals of all phases of fire protection. Objectives and techniques in use of fire.

**FOREST 3212. Forest Health and Protection. 4 Credits.**

Fundamental concepts of forest pathology and forest entomology including emphasis on ecological principles and management strategies. Prerequisite: Forestry [FOREST] 2151.

**FOREST 3217. Fire and Society. 2 Credits.**

A study of the relationship between society (humans) and fire. What kind of role does fire play in day-to-day life? How has fire influenced our behavior since Day 1? How do we view fire today?.

**FOREST 3240. Wood Technology. 3 Credits.**

Structure and identification of commercial woods. Relation of growth to physical and chemical properties of wood.

**FOREST 3290. Urban Forestry. 2 Credits.**

The culture and management of trees in urban areas, including ownership patterns, species composition, growth environment, amenities provided and evaluation. One-day field trip required. Prerequisites: Forestry [FOREST] 2151 or Plant Science [PLNT\_S] 2210, or instructor's consent.

**FOREST 3300. Problems in Forestry. 1-99 Credit.**

Problems in Forestry.

**FOREST 3350. Special Readings in Forestry. 1-99 Credit.**

Critical review of current literature and research in forestry, fisheries and wildlife, and methods of presenting research results.

**FOREST 4301. Topics in Forestry. 3 Credits.**

Organized study of selected topics. Intended for upper-division students. Subjects and credit may vary from semester to semester.

**FOREST 4320. Forest Ecology. 5 Credits.**

Principles of community, ecosystem, and population ecology and examination of the influence of environmental factors and human activity on forest dynamics, composition, structure and function. Prerequisites: Forestry [FOREST] 2151, Biological Sciences [BIO\_SC] 3210 or instructor's consent.

**FOREST 4330. Practice of Silviculture. 3 Credits.**

Applied ecological principles, cultural practices, tree improvement techniques and treatments to forest stands and other lands for systematic production of goods and services. Prerequisite: Forestry [FOREST] 4320.

**FOREST 4340. Tree Physiology. 3 Credits.**

Lectures on physical and chemical phenomena involved in the functions and activities of trees. Prerequisites: Biochemistry [BIOCHM] 2110, Biological Sciences [BIO\_SC] 1200, Chemistry [CHEM] 1100; or instructor's consent.

**FOREST 4350. Forest Economics. 3 Credits.**

Economic principles applied to production/marketing of goods and services from forest land: emphasizes capital and land factors and investment alternatives related to time. Prerequisites: Mathematics requirement completed; Agricultural Economics [AG\_EC] 1042, or 2070.

**FOREST 4360. Photogrammetry, Inventory and Models. 3 Credits.**

Applied course in the area of aerial photogrammetry, forest inventory, and forest growth models for developing, maintaining, and utilizing these tools in a forest management.

**FOREST 4365. Logging Systems: Operations and Analyses. 3 Credits.**

A systems approach to timber harvesting from acquisition through engineering to log transport. Regional aspects and influences will be considered. Prerequisites: Forestry [FOREST] 2540, 2541.

**FOREST 4370. Wildland Fire Management. 3 Credits.**

Management, administration, and organization of wildland and prescribed fires and other natural and man-made disasters. Emphasis placed on organizational arrangements of incidents rather than on either strategy or tactics. Prerequisites: Forestry [FOREST] 3207 or equivalent.

**FOREST 4375. Forest Stand Dynamics. 3 Credits.**

Examines the development of forest structure, the role of disturbance on forest change and the use of this knowledge in applying silvicultural systems. Both forest stand dynamics theories, structure diagrams, forest growth models, and long term data sets are used to understand stand dynamics. Prerequisite: Forestry [FOREST] 4330 or instructor's consent.

**FOREST 4380. Forest Resource Management. 3 Credits.**

Teaches resource managers how to develop a plan for the management of forest resources using managerial, economic, silvical and wildlife techniques for its enhancement and to meet the landowner's objectives. Prerequisites: Forestry [FOREST] 4330 and 4350.

**FOREST 4385. Agroforestry I: Theory, Practice and Adoption. 3 Credits.**

Understand biophysical, ecological, social and economic features of temperate and tropical agroforestry. Covers the basics of design, planning and implementation of agroforestry practices. Prerequisite: junior standing.

**FOREST 4387. Agroforestry Economics and Policy. 3 Credits.**

This course focuses on economic principles applied to the adoption and management of agroforestry practices at both the micro and macro scale. This includes cost and benefits analysis of ecosystem services and marketing of goods and services from agroforestry. More specifically, this course emphasizes both market and nonmarket valuation of managed tree and crop/livestock interactions; investment alternatives related to economics and natural resources; and decision making with relation to financial principles, environmental principles, and social principles. Prerequisite: Forestry [FOREST] 4385/7385, Agricultural Economics [AG\_EC] 1041 or permission of instructor. Graded on A/F basis only.

**FOREST 4390. Watershed Management and Water Quality. 3 Credits.**

Hydrologic processes on wildland watersheds. Effects of forest land management on streamflow, erosion and water quality. Prerequisites: Mathematics [MATH] 1400 or instructor's consent.

**FOREST 4940. Forestry Internship. 1-12 Credit.**

Supervised professional experience with an approved public or private organization. Forestry majors only, instructor's consent. Graded on S/U basis only. May be repeated for credit.



**FOREST 4950. Forestry Undergraduate Research. 1-4 Credit.**

Research apprenticeship with a faculty mentor. Students are expected to develop initial concept for the research, design experiments, collect data, and analyze data with faculty input, oversight, and guidance. Prerequisites: Senior standing, Statistics [STAT] 2530, and instructor's consent. Graded on A/F basis only.

**FOREST 4960. Special Readings in Forestry. 1-4 Credit.**

Individualized study on particular topic in forestry. Prerequisite: Senior standing required. Graded A/F only.

**FOREST 4994. Senior Honors Research in Forestry. 1-3 Credit.**

Prerequisites: 3.30 GPA and instructor's consent.

**FOREST 4995. Senior Honors Research in Forestry. 1-3 Credit.**

Prerequisites: 3.30 GPA and instructor's consent.

**FOREST 7301. Topics in Forestry. 1-99 Credit.**

Organized study of selected topics. Intended for upper-division and graduate students. Subjects and credit may vary from semester to semester. Prerequisite: graduate standing.

**FOREST 7320. Forest Ecology. 5 Credits.**

Principles of community, ecosystem, and population ecology and examination of the influence of environmental factors and human activity on forest dynamics, composition, structure and function. Prerequisites: graduate standing Forestry [FOREST] 2151 or Biological Science [BIO SC] 3210 or instructor's consent.

**FOREST 7330. Practice of Silviculture. 3 Credits.**

Applied ecological principles, cultural practices, tree improvement techniques and treatments to forest stands and other lands for systematic production of goods and services. Prerequisite: graduate standing and Forestry [FOREST] 4320.

**FOREST 7340. Tree Physiology. 3 Credits.**

Lectures on physical and chemical phenomena involved in the functions and activities of trees. Prerequisites: graduate standing, Biochemistry [BIOCHM] 2110; Biological Sciences [BIO\_SC] 1200; Chemistry [CHEM] 1100; or instructor's consent.

**FOREST 7350. Forest Economics. 3 Credits.**

Economic principles applied to production/marketing of goods and services from forest land: emphasizes capital and land factors and investment alternatives related to time. Prerequisites: graduate standing and Mathematics requirement completed; Agricultural Economics [AG\_EC] 1041, or 3080.

**FOREST 7360. Photogrammetry, Inventory and Models. 3 Credits.**

Applied course in the area of aerial photogrammetry, forest inventory, and forest growth models for developing, maintaining, and utilizing these tools in a forest management.

**FOREST 7365. Logging Systems: Operations and Analysis. 3 Credits.**

A systems approach to timber harvesting from acquisition through engineering to log transport. Regional aspects and influences will be considered. Prerequisites: graduate standing and Forestry [FOREST] 2543 and 2544.

**FOREST 7370. Wildland Fire Management. 3 Credits.**

Management, administration, and organization of wildland and prescribed fires and other natural and man-made disasters. Emphasis placed on organizational arrangements of incidents rather than on either strategy or tactics. Prerequisites: graduate standing and Forestry [FOREST] 3207 or equivalent.

**FOREST 7375. Forest Stand Dynamics. 3 Credits.**

Examines the development of forest structure, the role of disturbance on forest change and the use of this knowledge in applying silvicultural systems. Both forest stand dynamics theories, structure diagrams, forest growth models, and long term data sets are used to understand stand dynamics. Prerequisite: graduate standing and Forestry [FOREST] 4330 or instructor's consent.

**FOREST 7380. Forest Resource Management. 3 Credits.**

Teaches resource managers how to develop a plan for the management of forest resources using managerial, economic, silvical and wildlife techniques for its enhancement and to meet the landowner's objectives. Prerequisites: graduate standing and Forestry [FOREST] 4330 and 4350.

**FOREST 7385. Agroforestry I: Theory, Practice and Adoption. 3 Credits.**

Understand biophysical, ecological social and economic features of temperate and tropical agroforestry. Covers the basics of design, planning and implementation of agroforestry practices. Prerequisite: graduate standing.

**FOREST 7390. Watershed Management and Water Quality. 3 Credits.**

Hydrologic processes on wildland watersheds. Effects of forest land management on streamflow, erosion and water quality. Prerequisites: graduate standing and Mathematics [MATH] 1400 or instructor's consent.

**FOREST 8050. Research in Forestry. 1-99 Credit.**

Original research not leading to preparation of dissertation.

**FOREST 8090. Masters Thesis Research in Forestry. 1-10 Credit.**

Original investigation for presentation in a M.S. thesis. Graded on a S/U basis only.

**FOREST 8385. Ecological Principles of Agroforestry. 3 Credits.**

The course prepares students to develop an understanding of the complexity of agroforestry. Students will critically analyze classical and contemporary ecological theories and apply them in designing agroforestry practices to solve complex production and environmental issues. Prerequisites: Forestry [FOREST] 4385/7385 or permission of instructor. May be repeated for credit. Graded on A/F basis only.

**FOREST 8390. Physical Hydrology. 3 Credits.**

Students will obtain an understanding of hydrologic processes in terms of the occurrence, distribution and movement of water spanning the atmosphere and lithosphere. Students will have an opportunity to develop an understanding of physical processes governing mass and energy flux in wildland and anthropogenic systems. May be repeated for credit. Prerequisites: College Physics and Calculus I. Graded on A/F basis only.

**FOREST 8401. Topics in Forestry. 1-99 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester. Prerequisite: instructor's consent.

**FOREST 8430. Applied Silviculture. 3 Credits.**

Ecological and economic factors affecting application of silviculture in each of eighteen forest regions in United States. Prerequisite: Forestry [FOREST] 4330.

**FOREST 8450. Forest Soils. 3 Credits.**

Physical, chemical and biological properties of forest soils in relation to tree growth. Prerequisites: Forestry [FOREST] 4330 or instructor's consent.

**FOREST 8460. Advanced Forest Ecology. 3 Credits.**

Lecture/discussion based course emphasizing contemporary and classic ecological studies and concepts in the context of current forest ecology issues and research. Prerequisite: undergraduate ecology course.

**FOREST 8490. Advanced Forest Management. 3 Credits.**

Modern quantitative methods to facilitate decision-making in harvest scheduling and regulation, land use allocation, and production planning in natural resource management. Prerequisite: Forestry [FOREST] 4380.

**FOREST 8515. Advanced Forest Biometrics. 3 Credits.**

An introduction to the topics and philosophy of ecological modeling. The course will guide students through the process of developing a conceptual model, formalizing the model, formulating, parameterizing, and running the model as well as analyzing the results. Prerequisites: Statistics [STAT] 7070 or instructor's consent. Graduate Standing Required.

**FOREST 8520. Social Forestry. 3 Credits.**

Issues with using forestry as an international development tool; planning, implementing and evaluating farm and community forestry projects. Prerequisite: Forestry [FOREST] 4350, or Agricultural Economics [AG\_EC] 3270, or equivalent and instructor's consent.

**FOREST 8530. Ecosystem Management: The Human Dimension. 3 Credits.**

Overview of cultural, social, political and economic dimensions of natural resource problems and issues from an ecologically grounded management perspective. Prerequisite: Natural Resources [NAT\_R] 4353 or equivalent.

**FOREST 8540. Tree Growth-Quality Relationships. 3 Credits.**

Response of tree growth (wood formation) to such environmental influences fertilization, moisture, nutrient supply, wounding pruning, etc.

**FOREST 8620. Plant-Water Relations. 3 Credits.**

Absorption, translocation, utilization and loss of water by plants. Biophysics of water movement in the soil-plant-atmosphere continuum. Effects of water deficits on physiological processes.

**FOREST 8625. Plant-Water Relations Laboratory. 2 Credits.**

Introduction to techniques and instrumentation used in studies of plant-water relations. Corequisite: Forestry [FOREST] 8620.

**FOREST 9087. Seminar in Forestry. 1 Credit.**

Discussions of current developments in Forestry, and critical study of research programs. Graded on S/U basis only.

**FOREST 9090. Dissertation Research in Forestry. 1-10 Credit.**

Original investigation for presentation in a doctoral dissertation. Graded on a S/U basis only.

**FOREST 9410. Seminar in Forestry. 1 Credit.**

Discussions of current developments in Forestry, and critical study of research programs.

## French (FRENCH)

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**FRENCH 1100. Elementary French I. 5 Credits.**

An introductory course for students who wish to begin their study of French. It teaches the four skills--listening, speaking, reading, and writing. The class meets four days a week and one day in the lab. Classtime is used to practice the structures and vocabulary.

**FRENCH 1100H. Elementary French I - Honors. 5 Credits.**

This course designed for Honors students with 2-3 years of high school French focuses on the four skills, speaking, listening, reading and writing, and offers enriched cultural opportunities in and out of the classroom, such as movies, guest lectures, art exhibits, and plays. Students practice those skills, using authentic materials in real-life situations. Prerequisites: 2 years high school French; Honors eligibility required. Graded on A/F basis only.

**FRENCH 1200. Elementary French II. 5 Credits.**

The second course of the beginning language sequence is the continuation of French [FRENCH] 1100. It places equal emphasis on the four skills; listening, speaking, reading, and writing. Students who have prior knowledge of French are encouraged to take this course. Prerequisite: grade of C or better in French [FRENCH] 1100 or equivalent. NO credit for both FRENCH 1200 and 1250.

**FRENCH 1250. Accelerated Beginning French. 5 Credits.**

Course is designed for students who have taken more than two years of High School French. It offers a reinforcement of the beginning concepts of the French language and the many cultures it encompasses. Course allows students to further develop all language skills. NO credit for both French [FRENCH] 1200 and 1250.

**FRENCH 2001. Undergraduate Topics in French-General. 1-3 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester. May be repeated with consent of department. Prerequisite: French [FRENCH] 1200 with a grade of C or better.

**FRENCH 2004. Undergraduate Topics in French-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester. May be repeated with consent of department. Prerequisite: French [FRENCH] 1200 with a grade of C or better.

**FRENCH 2005. Undergraduate Topics in French-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester. May be repeated with consent of department. Prerequisite: French [FRENCH] 1200 with a grade of C or better.

**FRENCH 2100. Elementary French III. 3 Credits.**

A multi-skill course following French [FRENCH] 1200, centering on cultural/ literary reading, and including a grammar review, practice of the spoken language, as well as some practice in written expression. Prerequisite: grade of C or better in French [FRENCH] 1200 or 1250, or their equivalent courses.

**FRENCH 2100H. Elementary French III - Honors. 3 Credits.**

A multi-skill course following FRENCH 1200, centering on cultural/ literary reading, and including a grammar review, practice of the spoken language, as well as some practice in written expression. Prerequisite: grade of C or better in FRENCH 1200 or FRENCH 1250, or their equivalent courses. Honors Eligibility required.

**FRENCH 2160. Intermediate French Composition and Conversation. 3 Credits.**

A course designed to develop the ability to speak, read, and write in French via the reading of French short stories and/or a short novel. Grammar review. Prerequisite: French [FRENCH] 2100.

**FRENCH 2310. French Civilization. 3 Credits.**

Open to any student interested. No knowledge of French required. May not be included in area of concentration in French. Prerequisite: sophomore standing.

**FRENCH 2320. French Literature and Thought in English Translation I. 3 Credits.**

This course examines how the masterworks of French literature, from the Middle Ages to the eighteenth century, have influenced Western literary, cultural and philosophical traditions. Prerequisite: sophomore standing or instructor's consent.

**FRENCH 2330. French Literature in Translation II. 3 Credits.**

This course examines how the masterworks of French literature of the nineteenth and twentieth centuries have influenced Western literary, cultural and philosophical traditions. Prerequisite: sophomore standing or instructor's consent.

**FRENCH 2350. New World Francophone Literature in Translation. 3 Credits.**

A survey of literature written by Caribbean writers of French expression. Writers include M. Conde, P. Chamoiseau, A. Césaire, E. Glissant, S. Bart-Schwartz, R. Depestre and G. Etienne. Prerequisite: English [ENGLSH] 1000.

**FRENCH 2370. French Women Writers (in translation). 3 Credits.**

Survey of texts and contributions of French women writers from the medieval period to the 20th century. Prerequisite: sophomore standing.

**FRENCH 3001. Topics in French-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition.

**FRENCH 3004. Topics in French-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition.

**FRENCH 3005. Topics in French-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition.

**FRENCH 3005H. Topics in French-Humanities/Fine Arts - Honors. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition. Honors eligibility required.

**FRENCH 3160. Advanced French Composition and Conversation I. 3 Credits.**

Development of more sophisticated skills of written and oral expression. Prerequisites: French [FRENCH] 2160 or equivalent.

**FRENCH 3180. Les Fondations de la Civilisation Française. 3 Credits.**

Overview of French civilization from its origins to French Revolution. Studies will examine key cultural objects from art, literature, and popular culture as well as political and historical movements that have shaped development of French civilization. Ideal for students interested in engaging with issues, debates, and problems that helped to define the nascent French state. Prerequisite: French [FRENCH] 2160.

**FRENCH 3280. Commercial French. 3 Credits.**

Composition and Conversation course based on materials related to the French business world. Acquisition of business-related vocabulary. Introduction to French business operations and correspondence. Prerequisites: French [FRENCH] 2160 or equivalent.

**FRENCH 3410. Introduction to Literary Analysis. 3 Credits.**

Will acquaint students with vocabulary required for analysis of literary texts. Along with the traditional French method of poetry explication, students will learn to analyze the major literary genres (poetry, theatre, prose). Prerequisite: French [FRENCH] 3160.

**FRENCH 3420. Introduction to French Literature I. 3 Credits.**

Study of selected masterpieces of French literature from the Middle Ages through the 18th century. Prerequisites: French [FRENCH] 3160 is required; French [FRENCH] 3410 is highly recommended.

**FRENCH 3430. Introduction to French Literature II. 3 Credits.**

Study of selected masterpieces of French literature of the 19th and 20th centuries. Prerequisites: French [FRENCH] 3160 is required; French [FRENCH] 3410 is highly recommended.

**FRENCH 3440. Francophone Literature of North America. 3 Credits.**

A survey course of Francophone literature of New France, Louisiana territory and the French West Indies from its beginnings in the seventeenth century to the late twentieth century. Selected novels, poems and plays will be studied in their historical and social context. Prerequisite: French [FRENCH] 2160.

**FRENCH 3710. Survey of Minority & Creole Languages of the U.S. & the Caribbean. 3 Credits.**

(same as Spanish [SPAN] 3710 and Linguistics [LINGST] 3710). Analysis of the state of the minority languages of the U.S. and the Creole languages of the Caribbean with particular attention to the social status of these languages and speakers' attitudes toward them in the context of ethnic, cultural and national identity (taught in Eng.). Prerequisite: sophomore standing.

**FRENCH 4004. Topics in French-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing, departmental consent for repetition.

**FRENCH 4070. Intensive Beginning French. 3 Credits.**

Rapid acquisition of a reading knowledge of French. Cannot be taken to fulfill undergraduate language requirement. Prerequisites: instructor's consent.

**FRENCH 4120. Foreign Language Teaching Methodology. 3 Credits.**

(same as Spanish [SPAN] 4120). Theory and techniques of current foreign language methodology and their application in the classroom. Presentation of instructional projects, classroom observations, and strategies for classroom management. Prerequisite: departmental consent. May not be used toward Arts & Science major.

**FRENCH 4130. Stylistics. 3 Credits.**

A technical study of French as a means of communication and of self-expression, involving levels of meaning, rhetorical structure, and textual analysis. Prerequisites: French [FRENCH] 3160 or 3280 and 3420 or 3430.

**FRENCH 4410. French Medieval Literature. 3 Credits.**

Survey of representative works from the principal literary genres of the Middle Ages: epic (La Chanson de Roland), courtly romance (Chrétien de Troyes), chantefable (Aucassin et Nicolette), short story (lai, fabliau), theatre, and lyric poetry. Prerequisites: French [FRENCH] 3420 and 3430.

**FRENCH 4420. French Renaissance. 3 Credits.**

Survey of prose and poetry of the sixteenth century with significant emphasis on Montaigne, Rabelais, and the poetry of the Pleiade. Prerequisites: French [FRENCH] 3420 and 3430.

**FRENCH 4430. Seventeenth-Century French Literature. 3 Credits.**

Survey of major writers of the seventeenth century. The principal currents of the century as well as the Baroque and the classical movements are discussed. Authors include Corneille, Moliere, Racine, Descartes, Pascal, La Bruyere, La Rochefoucauld, and Madame de Lafayette. Prerequisite: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4440. Eighteenth-Century French Literature. 3 Credits.**

Through systematic and representative readings, this course familiarizes students with the literary trends and intellectual currents of 18th century France. The course includes works by Montesquieu, Voltaire, Rousseau, Laclos, Diderot, Marivaux, Prevost, and Beaumarchais. Prerequisites: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4450. Nineteenth-Century French Literature. 3 Credits.**

Selected readings from poetry and theatre with an emphasis on the various manifestations of Romanticism throughout the century. Works by Lamartine, Hugo, Vigny, Musset, Gautier, Nerval, Baudelaire, Verlaine, and Mallarme are included. Prerequisites: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4460. Twentieth-Century French Novel. 3 Credits.**

The course is a historical survey that deals with three topics: the modernist writings of the early twentieth century. (Proust, Gide, and Colette), existentialism of the mid-century (Sartre, Camus), and contemporary forms of writing (Beckett, Robbe-Grillet, Sarraute, among others). Prerequisites: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4470. Introduction to the Contemporary French Theatre. 3 Credits.**

Survey of twentieth-century French drama. Students read plays by Claudel, Giraudoux, Sartre, Anouilh, Beckett, Ionesco, Genet, and others. Strong emphasis is played on class discussions. Written analyses of two plays are assigned, and there is an hourly exam and a final. Prerequisites: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4480. Introduction to Modern French Poetry. 3 Credits.**

Introduction to major currents of French poetry from beginning of the 19th century to the present. Students will write explications of poems, present oral analyses and will be tested on poetic terms and poetic content/styles of various poems and poets. Prerequisite: French [FRENCH] 3420 and 3430.

**FRENCH 4490. Nineteenth-Century French Novel. 3 Credits.**

Study of the three major currents in prose fiction: romanticism, realism, and naturalism. Representative readings from Chateaubriand, Balzac, Stendhal, Flaubert, and Zola are included. Prerequisites: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4510. African Francophone Literature. 3 Credits.**

Course introduces contemporary African Literature to students via readings and detailed analysis of literary texts by Francophone African writers. Prerequisite: French [FRENCH] 3420 and 3430.

**FRENCH 4710. History of the French Language. 3 Credits.**

(same as Linguistics [LINGST] 4710). Study of the French language from its Latin origin to the present. The course includes a survey of the external social, political, and historical factors that have affected the development of French, followed by a diachronic study of the internal structural features of the language. Prerequisites: French [FRENCH] 3420 and French [FRENCH] 3430.

**FRENCH 4720. Structure of Modern French. 3 Credits.**

(same as Linguistics [LINGST] 4720). An introductory presentation of the phonological and syntactic systems of contemporary standard French. Prerequisites: French [FRENCH] 3160 or equivalent or instructor's consent.

**FRENCH 4820. Blogging the World: The Web in Cultural Context. 3 Credits.**

(same as German [GERMAN] and Russian [RUSS] 4820). Innovative interdisciplinary course addresses issues of access to international news and specific cultural context working in cross-disciplinary teams. Students in journalism, foreign language, international studies, political science and various other disciplines track cultural developments and information on non-US Web sites, blogs and digital social networks along with exploring various historical forms of communication that preceded the digital era of the Web. Students analyze the potential and limitations/ effects of blogs and the web in specific contemporary cultural contexts and as part of the broader historical evolution of the web. The course is taught in English. The goal of this course is two-fold; students learn the particulars of web blogging, explore various features of the contemporary social network landscape while focusing on the concept of culture, in particular the cultures of Europe and the US. Questions asked are: what is culture? What is common or popular right now in other cultures? And how do new social networks amplify or alter certain features or culture across national and international contexts? Prerequisite: sophomore standing required.

**FRENCH 4960. Special Readings in French. 1-3 Credit.**

Independent study through readings, conferences, reports. Prerequisite: French [FRENCH] 3420 and 3430 and departmental consent.

**FRENCH 4980. Special Themes in French. 3 Credits.**

Subject varies according to instructor. Prerequisites: French [FRENCH] 3420 and 3430. May be repeated for credit.

**FRENCH 4993. The Capstone Experience in French. 3 Credits.**

This course is required of all majors. Topics vary but all courses synthesize and review essential components of the major: speaking, writing, reading in French, and the ability to think critically and analytically.

**FRENCH 4996. Honors Reading in French. 1 Credit.**

Directed readings in area of honors thesis. Prerequisite: admission to departmental Honors program.

**FRENCH 7004. Topics in French-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: graduate standing, departmental consent for repetition.

**FRENCH 7110. Advanced oral French for Teachers. 1-99 Credit.**

Advanced speaking practice primarily for teachers with emphasis on pronunciation, syntactical accuracy and vocabulary expansion. Prerequisite: graduate standing and French [FRENCH] 3160 or equivalent. May not be used toward A & S Major. May be repeated for a maximum of 12 hours credit.

**FRENCH 7120. Foreign Language Teaching Methodology. 3 Credits.**

(same as Spanish [SPAN] 7120). Theory and techniques of current foreign language methodology and their application in the classroom. Presentation of instructional projects, classroom observations, and strategies for classroom management. Prerequisite: graduate standing or departmental consent. May not be used toward Arts & Science major.

**FRENCH 7130. Stylistics. 3 Credits.**

A technical study of French as a means of communication and of self-expression, involving levels of meaning, rhetorical structure, and textual analysis. Prerequisites: graduate standing and French [FRENCH] 3160 or 3280 and 3420 or 3430.

**FRENCH 7410. French Medieval Literature. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7420. French Renaissance. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7430. Seventeenth-Century French Literature. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7440. Eighteenth-Century French Literature. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7450. Nineteenth-Century French Literature. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7460. Twentieth-Century French Novel. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7470. Introduction to the Contemporary French Theatre. 3 Credits.**

Prerequisites: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7480. Introduction to Modern French Poetry. 3 Credits.**

Introduction to major currents of French poetry from beginning of the 19th century to the present. Students will write explications of poems, present oral analyses and will be tested on poetic terms and poetic content/styles of various poems and poets. Prerequisite: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7490. Nineteenth-Century French Novel. 3 Credits.**

Prerequisite: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7510. African Francophone Literature. 3 Credits.**

Course introduces contemporary African Literature to students via readings and detailed analysis of literary texts by Francophone African writers. Prerequisite: graduate standing and French [FRENCH] 3420 and 3430.

**FRENCH 7710. History of the French Language. 3 Credits.**

(same as Linguistics [LINGST] 7710). Required of M.A. candidates  
Prerequisites: French [FRENCH] 3420 and 3430.

**FRENCH 7720. Structure of Modern French. 3 Credits.**

(same as Linguistics [LINGST] 7720). An introductory presentation of the phonological and syntactic systems of contemporary standard French. Prerequisites: graduate standing and French [FRENCH] 3160 or equivalent or instructor's consent.

**FRENCH 7820. Blogging the World: The Web in Cultural Context. 3 Credits.**

(same as Russian [RUSS] 7820 and German [GERMAN] 7820). Innovative interdisciplinary course addresses issues of access to international news and specific cultural context. Working in cross-disciplinary teams, students in journalism, foreign language, international studies, political science and various other disciplines track cultural developments and information on non-US Web sites, blogs and digital social networks along with exploring various historical forms of communication that preceded the digital era of the Web. Students analyze the potential and limitations/effects of blogs and the web in specific contemporary cultural contexts and as part of the broader historical evolution of the web. The course is taught in English. The goal

of this course is two-fold: students learn the particulars of web blogging, explore various features of the contemporary social network landscape while focusing on the concepts of culture, in particular the cultures of Europe and the US. Questions asked are: what is culture? What is common or popular right now in other cultures? And how do new social networks amplify or alter certain features or culture across national and international contexts?.

**FRENCH 7960. Special Readings in French. 1-3 Credit.**

Independent study through readings, conferences, reports. Prerequisites: departmental consent.

**FRENCH 7980. Special Themes in French. 3 Credits.**

Subject varies according to instructor.

**FRENCH 7993. The Capstone Experience in French. 3 Credits.**

This course is required of all majors. Topics vary but all courses synthesize and review essential components of the major: speaking, writing, reading in French, and the ability to think critically and analytically. Prerequisite: graduate standing required.

**FRENCH 8080. Readings in French. 1-3 Credit.**

Independent readings in preparation for MA or MALT comprehensive examination in French. Graded on A/F basis only.

**FRENCH 8085. Problems in French. 1-99 Credit.**

Prerequisite: graduate standing.

**FRENCH 8087. Seminar in French. 2-3 Credit.**

Subject varies according to instructor. Prerequisite: graduate standing.

**FRENCH 8090. Research in French. 1-99 Credit.**

Leads to preparation of MA or MALT thesis. Graded on S/U only.

**FRENCH 8120. Bilingualism and Language Contact. 3 Credits.**

(same as Spanish [SPAN] 8120 and Linguistics [LINGST] 8120). Global analysis of the study of Bilingualism from a combined sociocultural, sociolinguistic and psycholinguistic perspective based on current research and examination of various phenomena of language contact (taught in English.). Prerequisite: graduate standing.

**FRENCH 8411. Old French. 3 Credits.**

Recommended: French [FRENCH] 4710/7710 and some knowledge of Latin.

**FRENCH 8412. Studies in French Medieval Literature. 3 Credits.**

Recommended: French [FRENCH] 4410/7710. Prerequisite: graduate standing.

**FRENCH 8416. Studies in the French Renaissance. 3 Credits.**

Prerequisite: graduate standing. Recommended: French [FRENCH] 4420/7420.

**FRENCH 8417. Studies in Seventeenth-Century French Literature. 3 Credits.**

Prerequisite: graduate standing. Recommended: French [FRENCH] 4430/7430.

**FRENCH 8418. Studies in Eighteenth-Century French Literature. 3 Credits.**

Prerequisite: graduate standing. Recommended: French [FRENCH] 4440/7440.

**FRENCH 8419. Studies in Nineteenth-Century French Literature. 3 Credits.**

Prerequisite: graduate standing. Recommended: French [FRENCH] 4450/7450 or 4490/7490.

**FRENCH 8420. Studies in Twentieth-Century French Literature. 3 Credits.**

Prerequisite: graduate standing. Recommended: French [FRENCH] 4460/7460, 4470/7470 or 4480/7480.

**FRENCH 9080. Readings in French. 3-6 Credit.**

Independent readings in preparation for the PhD comprehensive examination in French.

**FRENCH 9090. Research in French. 1-99 Credit.**

Leads to preparation of PhD dissertation in French. Graded on S/U basis only.

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## General Human Environmental Sciences (GN\_HES)

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**GN\_HES 1100. Introduction to Human Environmental Sciences. 1 Credit.**

Introduction to Human Environmental Sciences.

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## General Studies (G\_STDY)

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**G\_STDY 3301. Topics in General Studies. 1-99 Credit.**

Experimental and/or interdisciplinary. Subjects and earnable credit may vary from semester to semester.

**G\_STDY 4940. Internship in General Studies. 1-6 Credit.**

Internship limited to students pursuing the Bachelor of General Studies degree. S/U graded only.

**G\_STDY 4950. Special Project in General Studies. 1-6 Credit.**

With adviser's approval, student works with a faculty member on a major reading, research, or creative project, usually of interdisciplinary nature.

**G\_STDY 4960. Readings in General Studies. 1-6 Credit.**

Independent readings with supervisory faculty member. Open only to General Studies majors. May be repeated to a maximum of six hours.

**G\_STDY 4970. Directed Readings in General Studies. 1-6 Credit.**

Independent readings with supervisory faculty member; this course serves as the student's capstone experience. Open only to General Studies majors only.

**G\_STDY 4971. Internship in General Studies. 1-6 Credit.**

Internship experience which serves as the student's capstone experience. Program advisor must approve internship. Graded on S/U basis only. Section 2 of this course will be designated for Service Learning Capstone experience.

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## Geography (GEOG)

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**GEOG 1050. Introductory Meteorology. 3 Credits.**

(same as Atmospheric Science [ATM\_SC] 1050). Physical processes of atmosphere in relation to day-to-day changes in weather.

**GEOG 1100. Regions and Nations of the World I. 3 Credits.**

Introductory analysis for general education. Regional character, spatial relationships, major problems of Europe, North America (United States and Canada) and Latin America. Organized around basic concepts in field of geography.

**GEOG 1100H. Regions and Nations of the World I - Honors. 3 Credits.**

Introductory analysis for general education. Regional character, spatial relationships, major problems of Europe, North America (United States and Canada) and Latin America. Organized around basic concepts in field of geography. Honors eligibility required.

**GEOG 1200. Regions and Nations of the World II. 3 Credits.**

Introductory analysis for general education. Regional character, spatial relationships, problems of environment and development of the former Soviet Union, Pacific World, South and East Asia, Africa and Middle East. Organized around basic concepts in the field of geography. May be taken independently of Geography [GEOG] 1100.

**GEOG 1205H. Regions and Nations General Honors. 3 Credits.**

Honors eligibility required.

**GEOG 1550. Introduction to the Humanized Earth. 3 Credits.**

Examines human culture as a geographical element; the power of culture and human institutions in human-environmental interaction and the creation of agriculture, folk culture, popular culture, cities, and a broad range of cultural landscapes. Prerequisite: GEOG 1100 or GEOG 1200.

**GEOG 1600. Climate Change: Science and Public Policy. 3 Credits.**

This course will explore the role of physical science, environmental politics and public policy in shaping contemporary debate concerning climate change, mitigation, and adaptation strategies. We will examine the scientific rationale and statistical basis underwriting the concept of climate change, why aspects of the science remain controversial, the prospects of institutional action and the difficulties inherent in developing public policies targeting mitigation and adaptation. Course includes a role-playing simulation where students will play roles based on 2009 climate negotiations in Copenhagen, Denmark. Prerequisites: freshman and sophomores only. Graded on A/F basis only.

**GEOG 1800. Digital Earth: Introduction to the Geospatial Technologies. 3 Credits.**

Introduction to technologies used to map a changing world, with an emphasis on digital mapping explorations of human and environmental interactions on Earth. Course includes lab and fieldwork to introduce geographic information data collection and analysis techniques. Graded on A/F basis only. May be repeated for credit. Prerequisite: Freshman and sophomore standing or instructor's consent.

**GEOG 1840. Global Environmental Change. 3 Credits.**

Course uses a geographic framework to study patterns and processes related to global environmental change. Topics include environmental reconstruction, water resources, human-environment interactions, glaciers, fire, and climate. Prerequisite: freshman or sophomore standing.

**GEOG 2120. United States and Canada. 3 Credits.**

Intensive examination of selected areas and distributions. Regional systems, problems and planning. Prerequisite: sophomore standing.

**GEOG 2130. Geography of Missouri. 3 Credits.**

Physical, human, economic, and political geography of Missouri; regions of the state; geography applied to current state issues. Prerequisite: Geography [GEOG] 1100.

**GEOG 2210. Geography of Europe. 3 Credits.**

Survey of Europe's lands and peoples; emphasis on historical areal relationships as reflected in Europe's changing economic and political organization. Prerequisite: sophomore standing.

**GEOG 2260. Geography of East Asia. 3 Credits.**

Cultural, physical and economic geography of China, Japan, and Korea, with emphasis on China. Landscape analysis, determination of regional identities, and study of political forces evident in the development of the contemporary scene are stressed. Prerequisite: Geography [GEOG] 1200.

**GEOG 2270. Geography of Asia. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 2270). An introductory survey of the geography of Asia from India through Southeast Asia to China and Japan, emphasizing factors contributing to cultural similarities and variations, conflicts of interest, and current development.

**GEOG 2340. South America. 3 Credits.**

Physical environment and culture in the regional development of South America. Prerequisite: one course in Geography or instructor's consent.

**GEOG 2450. Themes in the Geography of Africa South of the Sahara. 3 Credits.**

(same as Black Studies [BL\_STU] 2450). Major concepts of African geography in current and historical perspective. Case studies of major African countries.

**GEOG 2580. Geography of Cemeteries. 3 Credits.**

Cemeteries have a discernible spatial and temporal pattern providing a foundation for geographical study. Migration, demographics, spatial analysis and basic mapping skills will be used to investigate cemeteries and their pattern. Prerequisite: freshman and sophomores only.

**GEOG 2610. Climate, Landforms and Vegetation: Introduction to Physical Geography. 3 Credits.**

Examination of the interacting natural systems that comprise the Earth's physical environment, including the atmosphere, biosphere, and landforms. Focus on relating fundamental physical, chemical and ecological processes to the global geographic patterns they produce.

**GEOG 2660. Environmental Geography. 3 Credits.**

Historical perspectives on the human agency in transforming the earth, with emphasis on international environmental problems. Topics include basic biogeography; environmental impacts of population growth, underdevelopment and overdevelopment; and new approaches to management of global resources.

**GEOG 2710. Economic Geography. 3 Credits.**

Geographical location and organization of world's major economic activities. Emphasizes agricultural and industrial patterns, commodity flows, transport networks, geographical principles of market and industrial location, internal spatial organization of cities, land-use models, geographic aspects of economics growth. Prerequisites: Geography [GEOG] 1100 or 1200 or sophomore standing.

**GEOG 2720. Urban Geography. 3 Credits.**

Study of cities: origin, development, distribution; social, economic, and demographic significance. Consideration of theories of structure, urban hierarchies, and land use planning. Prerequisites: Geography [GEOG] 1100, 1200 and two other Geography courses, or instructor's consent.

**GEOG 2840. Introduction to Mapping Science. 3 Credits.**

Introduction to basic map concepts, reinforced through lab exercises, lecture material and field work.

**GEOG 2904. Topics in Geography-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition.

**GEOG 3040. Introduction to Geographic Information Systems GIS. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 3050). Introduces theory, concepts and techniques related to the creation, manipulation, processing, and basic analysis of spatial data using GIS. Data management, current data models, GIS applications and course topics are reinforced through hands-on computer laboratory exercises. Prerequisite: sophomore standing or instructor's consent.

**GEOG 3140. Mexico, Central America, and the Caribbean. 3 Credits.**

Physical environment and culture in the regional development of Mexico, Central America, and the Caribbean. Prerequisite: one course in Geography or instructor's consent.

**GEOG 3260. Southeast Asia. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 3260). Physical, cultural, historical and regional geography of Southeast Asia, with an introduction to East Asian geography. Emphasizes the problems of tradition and development.

**GEOG 3270. Geography of the Middle East. 3 Credits.**

Cultural, physical and historical geography of Middle East, with emphasis on cultural adaptations to environments and conflicts over the resources.

**GEOG 3280. Geography of South Asia. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 3280). Topical and regional analysis of India, Pakistan, Sri Lanka. Historical development of distinctive cultural regions. Relations with neighboring areas. Impact of Westernization on economic activities, settlements, population.

**GEOG 3290. Geography of Russia and the Newly Independent States of Eurasia. 3 Credits.**

Geographic analysis of social, economic and political issues confronting Russia and the NIS, including environmental problems, economic interdependence and prospects for regional economic development, population change and migration, inter-ethnic relations and ethno-territorial conflict.

**GEOG 3385. Special Problems in Geography. 1-3 Credit.**

Independent investigation leading to a paper or project. May be repeated to a maximum of 6 hours. Prerequisite: instructor's consent.

**GEOG 3450. Geography of Africa. 3 Credits.**

Major concepts of African geography in current and historical perspective.

**GEOG 3510. Historical Geography of North America. 3 Credits.**

Analysis of selected geographical patterns and themes in the continent's past. Focus is explicitly geographical, stressing extensive use of maps and recent scholarly work by historical geographers. Prerequisites: junior standing, or instructor's consent.

**GEOG 3540. Geographies of Sexualities. 3 Credits.**

(Same as Women and Gender Studies [WGST] 3540) This class will explore the relationship of sexuality and space. The class will focus on the ways that sexuality creates particular spaces, and the ways that sexuality and space shape one another in the midst of nation, gender, religion, race, class, and generation. Sophomore standing required.

**GEOG 3560. Native American Geographies. 3 Credits.**

A survey of the Native American geographies in the United States. Historical and contemporary topics are covered employing cross-cultural perspectives including some philosophical views of the Earth and society, sense of place, memory, sacred land, colonialism and GIS representations, and natural resources.

**GEOG 3600. Climates of the World. 3 Credits.**

(same as Atmospheric Science [ATM\_SC] 3600). A study of the world distribution of climates based on "cause and effect" relationships. Special attention is given to the impacts of climate on humanity. Prerequisites: Geography [GEOG] 1050 or equivalent or graduate standing.

**GEOG 3610. Physical Geography of the United States. 3 Credits.**

Study of natural regions of the United States by integrating topics from landforms, geology, climate, soils, vegetation, resources, and land use. Prerequisites: geography [GEOG] 2610.

**GEOG 3630. Earth Surface Systems. 3 Credits.**

Systematic study of landforms geomorphic processes governing them. Provides a foundation for the theoretical, technical, and practical understanding of environmental systems. Prerequisites: Geography [GEOG] 2610 and junior standing or instructor's consent.

**GEOG 3740. Geography and Planning. 1-3 Credit.**

Emphasis on geographic techniques for gathering and generating environmental information for planners. Principles of land use planning will be applied to selected regions. Prerequisites: Geography [GEOG] 2840 and instructor's consent.

**GEOG 3760. Geography of the World's Religions. 3 Credits.**

(same as Religious Studies [REL\_ST] 3760). Explores the significance of place in the origin, diffusion, distribution and practice of religions, emphasizing imprints of religion on the cultural landscape and connections between culture, politics, economics, and religion. Prerequisite: 1000/2000 level Geography course; junior standing or instructor's consent.

**GEOG 3780. World Political Geography: Patterns and Processes. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3780). Geographic factors in the development of political boundaries traditions, and societal perspectives. Spatial patterns and geopolitical processes are explored in selected regions of the world. Prerequisites: Geography [GEOG] 1100 or 1200 or sophomore standing.

**GEOG 3830. Remote Sensing. 3 Credits.**

Introduction to the principles of remote sensing of the environment. Digital imagery from spacecraft, conventional and high-altitude aerial photography, thermal imaging, and microwave remote sensing. Prerequisite: Geography [GEOG] 2840 and instructor's consent.

**GEOG 3840. Cartography. 3 Credits.**

Principles of computer-assisted cartography. Automated cartographic display. "Hands on" experience with computer-mapping software and hardware systems. Role of computers in map design. Digital encoding of geographic data. Prerequisite: Geography [GEOG] 2840.

**GEOG 3904. Topics in Geography - Social Science. 1-12 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated up to 6 hours credit. Prerequisites: sophomore standing; departmental consent for repetition.

**GEOG 4130. The Geospatial Sciences in National Security. 3 Credits.**

(Same as Civil Engineering [CV\_ENG] 4175). This course explores the critical contribution of the geospatial sciences in the collection, processing, visualization and analysis of geospatial information related to national security. Prerequisite: junior standing or above required; instructor's consent. May be repeated for credit.

**GEOG 4390. Special Readings in Geography. 1-3 Credit.**

Independent readings selected in consultation with supervisory faculty member. May be repeated to a maximum of 6 hours. Prerequisite: instructor's consent and independent study contract.

**GEOG 4520. Environmental Biophysics. 3 Credits.**

(same as Atmospheric Science [ATM\_SC] 4520). Students will learn techniques and principles used to describe the microenvironment of living organisms and use quantitative expressions to estimate missing values, and mass transfer laws to estimate flux of energy, water and gas. Prerequisites: College Physics and Calculus I.

**GEOG 4550. Selected Themes in Cultural Geography. 3 Credits.**

Case studies in the patterns and processes of human-environmental interactions. Study of the cultural forces responsible for the continual transformation of the earth's cultural landscapes.

**GEOG 4560. Resources and Indigenous Peoples. 3 Credits.**

This is a survey of indigenous peoples' struggle to control and use natural resources, to have a say in determining the path of economic development, and to restrain the destructive tendencies of colonialism and capitalism, challenging traditional state-to-state relations. Junior standing required. Cross level with Geography [GEOG] 7560.

**GEOG 4620. Biogeography: Global Patterns of Life. 3 Credits.**

Analysis of the patterns and processes of plant distribution in the contemporary landscape, stressing environmental influences and vegetation dynamics, particularly as they relate to North American vegetation. Prerequisite: Geography [GEOG] 2610 and junior standing, or instructor's consent.

**GEOG 4630. River and Stream Dynamics. 3 Credits.**

Systematic study of river mechanics, stream-channel form, river management and restoration. Provides a theoretical and practical understanding of stream systems. Prerequisite: Geography [GEOG] 2610 and 3630, or instructor's consent.

**GEOG 4710. Spatial Analysis in Geography. 3 Credits.**

Application of statistical methods to geographic research. Prepares students to utilize advanced methodologies and models in spatial analysis. Includes computer analysis of geographical data. Prerequisite: Mathematics [MATH] 1100/1120. Math Reasoning Proficiency Course.

**GEOG 4720. Seminar in Geography Education. 3 Credits.**

Study and research on fundamental themes in geography. Integration of these themes into regional and systematic approaches to the teaching of geography. Enrollment is restricted to students pursuing or considering careers in teaching. Prerequisites: junior standing and instructor's consent.

**GEOG 4740. Location Analysis and Site Selection. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4185). An overview of location analysis in regional planning and spatial decision support, this course focuses on the use of Geographic Information Science (GIS) and location analysis methods in addressing regional service needs. May be repeated for credit.

**GEOG 4770. Migration and Immigration. 3 Credits.**

Explores demographic, economic, and social issues surrounding immigration and migration. The course focuses on the global labor migration system, immigration to the United States, and internal migration within the US, as well as the linkages between these systems.

**GEOG 4780. Selected Themes in Political Geography. 3 Credits.**

Study of basic writing, dominant geographers, case studies, bibliographies and development of research methods.



**GEOG 4790. Geographic Information Systems for the Social Sciences. 3 Credits.**

Designed for social science students interested in learning about the tools available in GIS for linking to and analyzing spatial qualitative data. Uses multiple data sources (qualitative and quantitative), applied within a social context, using spatial investigation procedures to detect geographical trends in data sets. Primary focus is on how GIS can enhance social science research. Prerequisites: juniors and seniors only.

**GEOG 4810. Landscape Ecology and GIS Analysis I. 3 Credits.**

(same as Natural Resources [NAT\_R] 4385). Examination of the landscape-scale approach to biodiversity, ecosystem dynamics, and habitat management. Particular emphasis on the use of Geographic Information Systems to analyze the spatial dimension of ecological patterns and processes. Prerequisite: Geography [GEOG] 4840, or instructor's consent.

**GEOG 4850. Transportation Geography. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4155). Introduction to fundamental concepts and modes of analysis in transportation geography. Focus on descriptive, explanatory, as well as normative approaches. Topics reviewed include spatial organization, transportation economics, spatial interaction, network analysis, location/allocation, and urban transportation planning.

**GEOG 4860. Advanced Remote Sensing. 3 Credits.**

Advanced remote sensing to provide digital image processing techniques for satellite and airborne imagery; emphasis on spatial/spectral analysis, image classification and land use/land cover change detection. Class project heavily involved. Prerequisite: Geography [GEOG] 4830.

**GEOG 4904. Topics in Geography-Social Science. 1-12 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent; departmental consent for repetition.

**GEOG 4940. Advanced Geographic Information Systems (GIS II). 3 Credits.**

Advanced study of geographic and spatial analysis and modeling utilizing Geographic Information Systems technology. Focus on project management, research applications, and geostatistical analysis through independent research projects. Prerequisite: Geography [GEOG] 3040 or instructor's permission.

**GEOG 4945. Internship in Applied Geography and Cartography. 1-3 Credit.**

Regularized individual work experience with local, regional, state or national agencies, with guidance and readings supplied by faculty coordinator. May repeat to maximum of 6 hours. Prerequisites: upper-level standing in Geography, cartographic training, and departmental consent.

**GEOG 4990. Senior Seminar in Geography. 3 Credits.**

A seminar in selected themes in Geography. Class will focus on research, writing, presenting, and discussing themes in contemporary geography. Required of all majors prior to graduation. Prerequisite: 5 courses in geography or instructor's consent.

**GEOG 4996H. Honors in Geography. 3 Credits.**

Special work for Honors candidates in geography. Honors eligibility required.

**GEOG 4997H. Honors in Geography. 3 Credits.**

Special work for Honors candidates in geography. Honors eligibility required.

**GEOG 7130. The Geospatial Sciences in National Security. 3 Credits.**

(Same as Civil Engineering [CV\_ENG] 7175). This course explores the critical contribution of the geospatial sciences in the collection, processing, visualization and analysis of geospatial information related to national security. Prerequisite: junior standing or above required; instructor's consent. May be repeated for credit.

**GEOG 7520. Meteorology of the Biosphere. 3 Credits.**

(same as Atmospheric Science [ATM\_SC] 7520). Energy balance and mass transfer microenvironment of plants and animals. Effects of weather events on plants and animal production discussed. Prerequisites: graduate standing and Mathematics [MATH] 1400 or equivalent; one year of college physics; or instructor's consent.

**GEOG 7550. Selected Themes in Cultural Geography. 3 Credits.**

Case studies in the patterns and processes of human-environmental interactions. Study of the cultural forces responsible for the continual transformation of the earth's cultural landscapes. Prerequisite: graduate standing.

**GEOG 7560. Resources and Indigenous Peoples. 3 Credits.**

This is a survey of indigenous peoples' struggle to control and use natural resources, to have a say in determining the path of economic development, and to restrain the destructive tendencies of colonialism and capitalism, challenging traditional state-to-state relations. Prerequisite: graduate standing.

**GEOG 7620. Biogeography: Global Patterns of Life. 3 Credits.**

Analysis of the patterns and processes of plant distribution in the contemporary landscape, stressing environmental influences and vegetation dynamics, particularly as they relate to North American vegetation. Prerequisite: graduate standing and Geography [GEOG] 2610 or instructor's consent.

**GEOG 7630. River and Stream Dynamics. 3 Credits.**

Systematic study of river mechanics, stream-channel form, river management and restoration. Provides a theoretical and practical understanding of stream systems. Prerequisite: graduate standing and Geography [GEOG] 2610 and 3630, or instructor's consent.

**GEOG 7710. Spatial Analysis in Geography. 3 Credits.**

Application of statistical methods to geographic research. Prepares students to utilize advanced methodologies and models in spatial analysis. Includes computer analysis of geographical data. Prerequisite: graduate standing and Mathematics [MATH] 1100/1120.

**GEOG 7720. Seminar in Geography Education. 3 Credits.**

Study and research on fundamental themes in geography. Integration of these themes into regional and systematic approaches to the teaching of geography. Enrollment is restricted to students pursuing or considering careers in teaching. Prerequisites: graduate standing and instructor's consent.

**GEOG 7740. Location Analysis and Site Selection. 3 Credits.**

(Same as Civil Engineering [CV\_ENG] 7185). An overview of location analysis in regional planning and spatial decision support, this course focuses on the use of Geographic Information Science (GIS) and location analysis methods in addressing regional service needs. May be repeated for credit.

**GEOG 7770. Migration and Immigration. 3 Credits.**

As fertility and mortality decline to record low levels, immigration and migration have become the primary components of population change. Changes brought on by immigration to a country and the internal redistribution of population via migration pose challenges to

governments, economic development, social and cultural relations, and environmental sustainability. This course explores issues surrounding immigration and migration. Beginning with the demographic overview of immigration, it focuses on the challenges faced by immigrant, sending, and receiving nations in the global migration system. The second part of the course focuses on the array of issues surrounding immigration to the United States, including the socio-economic adaptation of immigrants, the economic and cultural impacts of immigration, and illegal immigration. The third part of the course focuses on internal migration within migration within the US, discussing topics such as migration to the Sunbelt, Great Plains depopulation, poverty migration, migration to the suburbs, and migration's impact on community. Linkages between domestic migration and immigration will also be explored.

**GEOG 7780. Selected Themes in Political Geography. 3 Credits.**

Study of basic writing, dominant geographers, case studies, bibliographies and development of research methods. Prerequisites: graduate standing.

**GEOG 7790. Geographic Information Systems for the Social Sciences. 3 Credits.**

Designed for social science students interested in learning about the tools available in GIS for linking to an analyzing spatial qualitative data. Uses multiple data sources (qualitative and quantitative), applied within a social context, using spatial investigation procedures to detect geographical trends in data sets. Primary focus is on how GIS can enhance social science research. Prerequisites: graduate standing.

**GEOG 7810. Landscape Ecology and GIS Analysis I. 3 Credits.**

(same as Natural Resources [NAT\_R] 7385). Examination of the landscape-scale approach to biodiversity, ecosystem dynamics, and habitat management. Particular emphasis on the use of Geographic Information Systems to analyze the spatial dimension of ecological patterns and processes. Prerequisite: graduate standing and or instructor's consent.

**GEOG 7840. Geographic Information Systems I. 3 Credits.**

Introductory study of theory, concepts and techniques related to basic analysis, creation and processing of geographic and spatial data using Geographic Information Systems (GIS). Independent learning and computer-based laboratory exercises supplement theoretical lectures and discussion. Prerequisite: graduate standing.

**GEOG 7850. Transportation Geography. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7155). Introduction to fundamental concepts and modes of analysis in transportation geography. Focus on descriptive, explanatory, as well as normative approaches. Topics reviewed include spatial organization, transportation economics, spatial interaction, network analysis, location/allocation, and urban transportation planning.

**GEOG 7860. Advanced Remote Sensing. 3 Credits.**

Advanced remote sensing to provide digital image processing techniques for satellite and airborne imagery; emphasis on spatial/spectral analysis, image classification and land use/land cover change detection. Class project heavily involved. Prerequisite: graduate standing and Geography [GEOG] 4830.

**GEOG 7904. Topics in Geography-Social Science. 1-12 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: graduate standing and instructor's consent; departmental consent for repetition.

**GEOG 7940. Advanced Geographic Information Systems (GIS II). 3 Credits.**

Advanced study of geographic and spatial analysis and modeling utilizing Geographic Information Systems technology. Focus on project management, research applications, and geostatistical analysis through independent research projects. Prerequisite: Geography [GEOG] 7840 or instructor's consent.

**GEOG 8080. Research in Geography. 1-6 Credit.**

Research not leading to thesis. May be repeated to a maximum of 6 hours. Prerequisite: instructor's consent. Graded on a S/U basis only.

**GEOG 8085. Special Investigations in Geography. 1-3 Credit.**

Advanced studies to meet the needs of the individual student. May be repeated to a maximum of 6 hours. Prerequisite: instructor's consent and independent study contract.

**GEOG 8090. Research in Geography. 1-8 Credit.**

Research leading to a thesis. May be repeated to a maximum of 8 hours. Prerequisite: instructor's consent and independent study contract. Graded on a S/U basis only.

**GEOG 8100. Seminar in World Regional Geography I. 1 Credit.**

Problems in the teaching of world regional geography on college level. Prerequisite: instructor's consent.

**GEOG 8120. Seminar in the Geography of Anglo-America. 1-3 Credit.**

Readings and research on problems in the geography of the United States and Canada. Prerequisite: graduate standing in Geography or instructor's consent.

**GEOG 8200. Seminar in World Regional Geography II. 1 Credit.**

Continuation of course Geography [GEOG] 8100. Prerequisite: instructor's consent.

**GEOG 8270. Seminar in the Geography of the Middle East. 3 Credits.**

Advanced readings and analysis of topics in the geography of the Middle East. Prerequisite: instructor's consent.

**GEOG 8710. Seminar. 1-3 Credit.**

May be repeated to a maximum of 6 hours. Prerequisite: departmental consent.

**GEOG 8750. Research Design. 3 Credits.**

Application of scientific methods in geographic research. Critical evaluation of current geographical methodology. Prerequisite: graduate standing in Geography or instructor's consent.

**GEOG 8760. Geographic Thought. 3 Credits.**

Discussion of the historic roots of the discipline, especially the ideas, theories and underlying philosophies that have defined Geography in the past century and a half. Students will also explore the philosophical and theoretical ideas that shape the way geographers approach the study of the world. Prerequisite: instructor's consent.

**GEOG 8815. Landscape Ecology and GIS Analysis II. 3 Credits.**

(same as Natural Resources [NAT\_R] 8395). Provide students with principles and applications of landscape ecology and firm understandings of spatial analysis techniques using GIS. Discuss metrics for spatial pattern and models for landscape-scale dynamics. Prerequisite: graduate standing and Natural Resources [NAT\_R] 4365/7385; Forestry [FOREST] 4302/7302 or equivalent; basic statistics; Geography [GEOG] 4810/7810 recommended; instructor's consent.

**GEOG 8820. Field Geography. 3 Credits.**

Techniques of geographical investigation in the field. Prerequisites: graduate standing in Geography or instructor's consent.

**GEOG 8840. Seminar: Applied Remote Sensing. 3 Credits.**

Applied project in remote sensing. Data selection, image processing, land use and land cover change, and quantitative biophysical information extraction from remotely sensed data. Prerequisite: Geography [GEOG] 4830 or instructor's consent.

**GEOG 8902. Topics in Geography-Biological/Physical/Mathematical. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: instructor's consent; departmental consent for repetition.

## Geology (GEOL)

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**GEOL 1050. Planet Earth. 3 Credits.**

An introduction to Earth Science. Topics include: evidence for continental drift and plate tectonics, causes and prediction of natural hazards, the scale of geological time.

**GEOL 1100. Principles of Geology with Laboratory. 4 Credits.**

Three lectures, 2-hours lab. Earth processes and products and their impact on human needs and the environment. One field trip.

**GEOL 1100H. Principles of Geology with Laboratory - Honors. 4 Credits.**

Three lectures, 2-hours lab. Earth processes and products and their impact on human needs and the environment. One field trip. Honors eligibility required.

**GEOL 1150. Physical Geology for Scientists and Engineers. 4 Credits.**

Introduction to physical geology and basic earth processes with a focus on applications and societal relevance. In addition to basic geologic processes, basic physical principles will illustrate the interactions between geology and engineering Prerequisite: Mathematics [MATH] 1500. Instructor's consent required.

**GEOL 1200. Environmental Geology with Laboratory. 4 Credits.**

The interaction between geologic processes and human society. Topics include mineral, water, and energy resources, volcanic hazards, earthquakes, landslides, floods, coastal erosion, pollution problems and environmental management.

**GEOL 1250. The World's Oceans. 3 Credits.**

An interdisciplinary introduction to oceanography. Topics include: geologic evolution of ocean basins, properties of seawater, ocean circulation (waves, tides, and currents), marine ecosystems, instability of beaches and coastlines, coastal development and engineering.

**GEOL 1400. Themes in Geology. 1 Credit.**

5-week course organized around a central theme or topic, up to 3 different sections can be taken for credit.

**GEOL 2100. Independent Study in Geology. 1-3 Credit.**

Directed Library research in geological topics, under the supervision of faculty sponsor. May be repeated for a maximum of 3 hours credit. Prerequisite: instructor's consent.

**GEOL 2110. Introduction to Soil Science with Laboratory. 5 Credits.**

(same as Soil Science [SOIL] 2110). Introduction to Soil Science with emphasis placed on physical, biological, and chemical properties and applications to land use, plant growth, and environmental problems with

laboratory application of these concepts. Prerequisite: Chemistry [CHEM] 1320.

**GEOL 2120H. Faults and Earthquakes: Past, Present, and Future. 3 Credits.**

Seminar in science and societal ramifications of earthquakes. Geologic background includes causes, behavior, and distribution of faults. Student-led discussions cover historical disasters, economic, political, psychological, and cultural perspectives. Prerequisite: English [ENGLSH] 1000. Honors eligibility required.

**GEOL 2150. The Age of the Dinosaurs. 3 Credits.**

Study of the evolution of dinosaurs during the Mesozoic Era. New information on dinosaur life habits, food resources, dispersal by plate tectonics, and theories of extinction will be covered. Prerequisite: 1000-level science course.

**GEOL 2160H. Volcanoes and the Human Environment - Honors. 3 Credits.**

(same as Honors [GN\_HON] 2450H). This course gives students an understanding of how volcanoes work, how they are studied, and how they have impacted human cultures. Students will gain appreciation of volcanology as a broad scientific discipline within geology and the role that science plays in public policy. Honors eligibility required. Graded on A/F basis only.

**GEOL 2200. Oceanography. 3 Credits.**

Topics include: history and methods of marine research, properties of seawater, ocean circulation, biological productivity and zonation, origin and classification of marine sediments, character of major coastal and open-ocean environments, economic resources and environmental hazards. Prerequisite: Mathematics [MATH] 1100/1120. Math Reasoning Proficiency Course.

**GEOL 2220H. Honors Seminar: Headline Topics in the Geological Science. 3 Credits.**

Seminar organized around a central theme that is the focus of intense ongoing research and public debate. Prerequisite: English [ENGLSH] 1000. Honors eligibility required.

**GEOL 2300. Earth Systems and Global Change. 3 Credits.**

Study of the earth as a whole, taking into account the many interwoven components of the geosphere, hydrosphere, atmosphere and biosphere. Prerequisite: 1000-level Science course.

**GEOL 2350. Historical Geology. 3 Credits.**

Summary of principles and techniques used in reconstructing Earth's history. Survey of major events that have affected Earth and its inhabitants. Review of geologic history of North America. Prerequisites: Geology [GEO] 1100 or 1200 and English [ENGLSH] 1000.

**GEOL 2360. Historical Geology Laboratory. 1 Credit.**

A laboratory course designed to improve understanding of Earth History by examination of maps and mineral, rock, sediment and fossil samples. Prerequisites: Geology [GEO] 1100 or 1200, Co-enrollment in 2350.

**GEOL 2400. Surficial Earth Processes and Products with Laboratory. 4 Credits.**

Semiquantitative analysis of geologic processes that shape the earth's surface. Includes topics in sedimentation and geomorphology. Prerequisites: Geology [GEO] 1100 OR 1200 and Mathematics [MATH] 1100/1120.

**GEOL 2450. Global Water Cycle. 3 Credits.**

Study of environmental geochemical factors controlling the composition of natural waters, and sources of water's constituents (natural or

human-produced). Prerequisites: Geology [GEOL] 1100 or 1200 and Mathematics [MATH] 1100/1120. Math Reasoning Proficiency Course.

**GEOL 2500. Regional Geology Field Trip. 3 Credits.**

Field based study of a particular geologic region, including classroom preparation prior to the field trip. The trip will last 7-10 days, either during Spring Break or immediately after finals week. Prerequisite: Geology [GEOL] 1100 or 1200. May be repeated for credit.

**GEOL 2600. Mineral and Energy Resources of the Earth. 3 Credits.**

This course examines the geology of Earth's major mineral and energy resources--their origin, distribution, and characteristics--and societal implications of their use and abundance. Major topics: fossil fuels, nuclear energy, base & precious metals, non-metallic minerals, water. Prerequisite: Geology [GEOL] 1100 or 1200.

**GEOL 3085. Problems in Geological Sciences. 1-5 Credit.**

Prerequisite: instructor's consent.

**GEOL 3110. Geology of Missouri. 3 Credits.**

The physical, historical, and environmental geology of Missouri are described, discussed and interpreted. Prerequisites: English [ENGLISH] 1000 and either Geology [GEOL] 1100 or 1200.

**GEOL 3115. Geology of Missouri Laboratory. 1 Credit.**

A field based and laboratory based course that uses standard geological techniques to interpret the rock record of Boone County and Missouri. Corequisite: Geology [GEOL] 3110.

**GEOL 3200. Rocks and Rock-Forming Minerals: Identification, Occurrence and Origin. 3 Credits.**

Introduction to the classification, occurrence, and origin of rocks and rock-forming minerals. Prerequisites: Geology [GEOL] 1100 or 1200 and Chemistry [CHEM] 1310.

**GEOL 3210. Rocks and Rock-Forming Minerals Laboratory. 1 Credit.**

Identification of rock-forming minerals and rocks in hand specimen by their physical properties. Corequisite: Geology [GEOL] 3200.

**GEOL 3250. Mineralogy. 5 Credits.**

Introduction to crystallography, crystal chemistry and crystal structures. Systematic study of mineral groups. Includes identification of minerals by physical, chemical and optical properties. Prerequisite: Chemistry [CHEM] 1310.

**GEOL 3300. Introduction to Geochemistry. 3 Credits.**

Fundamentals of chemistry as applied to geology. Includes phase diagrams, thermodynamics, redox chemistry, aqueous chemistry, stable and radiogenic isotopes. Computer-based homework problems (satisfies computing requirement for Geology majors). Prerequisites: Chemistry [CHEM] 1330 (may be co-enrolled), Mathematics [MATH] 1400 or 1500, and Geology [GEOL] 1100 or 1200, or instructor's consent.

**GEOL 3800. Sedimentology with Lab. 4 Credits.**

Mechanics of sediment transport by fluid flow and gravity flow, origins of stratification and sedimentary structures, facies characteristics depositional environments. Prerequisite: Geology [GEOL] 2350 and 2400 and either Geology [GEOL] 3250 or 3200 and 3210.

**GEOL 4002. Topics in Geological Sciences-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary. May be repeated with departmental consent. Prerequisite: instructor's consent.

**GEOL 4100. Groundwater Hydrology. 3 Credits.**

Analysis of groundwater occurrence, flow, recovery, and solute transport within shallow levels of the Earth's crust. Prerequisites: Geology [GEOL] 1100 or 1200, Physics [PHYSICS] 1210, Mathematics [MATH] 1400 or 1500.

**GEOL 4110. Karst Hydrology. 3 Credits.**

The hydrology of karst terrains is taught from the perspective of integrated drainage basins. Discussion addresses the origin and hydrogeology of karst aquifers and the biology of the animals that live in karstic aquifers. Prerequisite: instructor's consent.

**GEOL 4120. Engineering Geology. 3 Credits.**

Fundamentals of earth materials and geological processes and their applications in engineering works and environmental sciences. Includes properties of minerals and rocks, rock and soil mechanics, surficial geological processes, and practice of engineering. Prerequisite: GEOL 1100 or 1200 and MATH 1700 or 2100, or instructor's consent.

**GEOL 4130. Groundwater Modeling. 3 Credits.**

Use of leading groundwater flow and contamination modeling software. Theory of groundwater flow, solute transport, and selected numerical solution techniques. Applications to water resource, environmental, and geological problems. Prerequisite: Geology [GEOL] 4100 or equivalent.

**GEOL 4150. Structural Geology. 4 Credits.**

The mechanical behavior of earth materials. Analysis of the geometry and mechanics of faults, fractures, and folds. Laboratory includes problems on stresses and strains associated with deformation, geometric analysis of deformation structures, and interpretation of geologic maps. Prerequisites: Geology [GEOL] 1100 or 1200 and Mathematics [MATH] 1500 or 1400.

**GEOL 4180. Solar System Science. 3 Credits.**

(same as Physics [PHYSICS] 4180 and Astronomy [ASTRON] 4180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution. Prerequisites: Mathematics [MATH] 1700 and Physics [PHYSICS] 1220 or 2760 or instructor's consent.

**GEOL 4200. Economic Geology with Laboratory. 4 Credits.**

Geochemistry of ore deposits. Introduction to types of mineral deposits, genesis of ore, and current areas of research. Laboratory emphasizes hand-specimen and polished-section studies of a wide variety of ore deposit types. Prerequisites: Geology [GEOL] 3900.

**GEOL 4210. Marine Geology. 3 Credits.**

Comprehensive examination of the geology of the oceans. Topics includes techniques of data collection and interpretation, physical oceanography, origin of marine sediments, marine tectonics, and ocean history. Prerequisites: Geology [GEOL] 3800 Chemistry [CHEM] 1330 and Physics [PHYSICS] 1220.

**GEOL 4300. Introduction to Low-Temperature Geochemistry. 3 Credits.**

Introduction to the chemical alteration of rock-forming minerals in weathering environments and to factors controlling the chemical composition of subsurface water. Prerequisite: Geology [GEOL] 3300 or instructor's consent.

**GEOL 4318. Environmental Soil Chemistry. 3 Credits.**

(same as Soils [SOIL] 4318 and Environmental Science [ENV\_SC] 4318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption

processes. Prerequisites: Soil Sciences [SOIL] 2100 or Geology [GEOL] 2400, Chemistry [CHEM] 1320 and 1330. Junior standing or instructor's consent.

**GEOL 4400. Geomicrobiology and Microbial Biogeochemistry. 3 Credits.**

Roles of microbes in a variety of geological settings through time. Microbial roles in degradation of organic pollutants and transformation of toxic metals and radionuclides in contaminated environments. Prerequisite: Geology [GEOL] 3300 or instructor's consent.

**GEOL 4500. Organic Geochemistry. 3 Credits.**

Topics include chemistry of petroleum-forming reactions and their kinetic parameters; use of organic-chemical criteria in source-rock evaluation; carbon isotope fractionation in organic precursors of biological molecules; early history of earth's atmosphere. Prerequisite: instructor's consent.

**GEOL 4550. Introduction to Paleontology with Laboratory. 4 Credits.**

Study of the morphology, paleontology, patterns of evolution, and causes of extinction in geologically important groups of invertebrate and vertebrate fossils. Lab concentrates on identification of biostratigraphically important fossils (mostly invertebrates). Several half-day field trips. Prerequisites: Geology [GEOL] 1100 or 1200.

**GEOL 4650. Plate Tectonics. 3 Credits.**

Formation, evolution, and structure of the earth. Rules, causes, and implications of plate tectonics with emphasis on present-day features. Prerequisites: Geology [GEOL] 3250, 4150 or instructor's consent.

**GEOL 4680. Neotectonics and Earthquake Geology. 3 Credits.**

Introduction to techniques and concepts of active crustal deformation from the geological and geodetic perspectives. Topics include tectonic geomorphology, paleoseismology, Quaternary dating, tectonic geodesy, numerical models of faults, and earthquake hazard assessment. Prerequisites: Geology [GEOL] 4650 or 4150 and instructor's consent.

**GEOL 4700. Theoretical Geochemistry. 3 Credits.**

Introduction to theoretical concepts in low and high temperature geochemistry. Topics include thermodynamics of fluids, gases and solids in geological materials, phase diagrams, equilibrium constants, electrolyte theory, oxidation-reduction reactions. Prerequisites: Geology [GEOL] 3250, Chemistry [CHEM] 1330 and Mathematics [MATH] 1700.

**GEOL 4800. Introduction to Geophysics. 3 Credits.**

Introduction to the fundamentals of geophysical methods and their applications in geology, environmental studies, and exploration. Topics include seismic, gravity, magnetic, and electric methods. Prerequisite: Physics [PHYSICS] 1210 or 2750 and Mathematics [MATH] 1700.

**GEOL 4900. Igneous and Metamorphic Petrology with Laboratory. 4 Credits.**

Introduction to igneous and metamorphic rock associations and rock-forming processes. Emphasis on understanding the evolution of the Earth in view of igneous and metamorphic rock petrogenesis. Prerequisites: Geology [GEOL] 3250 and 3300.

**GEOL 4950. Senior Thesis. 1-3 Credit.**

Research conducted in an area of the Geological Sciences under the auspices of a member of the faculty. Under normal circumstances, this research should be completed over two semesters. May be repeated for a maximum of 3 hours credit.

**GEOL 4990. Communicating in the Earth Sciences. 3 Credits.**

Synthesis of Geology curriculum through study of classic Earth Science papers. Emphasizes critical analysis of scientific papers, data interpretation, science writing and oral presentations. Prerequisites:

Geology [GEOL] 3800 and senior standing or instructors permission. Satisfies Capstone for BA in Environmental Geology.

**GEOL 4991. Capstone in Environmental Geology. 1-3 Credit.**

Readings and discussions in selected areas of environmental geology. Subject depends on instructor. Restricted to Environmental Geology students. 3 credit hour Capstone must be completed unless student completes a Senior Thesis. In that case, Capstone + Senior Thesis credit hours must equal 3.

**GEOL 4992. Field Course. 6 Credits.**

Field study of sedimentary, igneous and metamorphic rocks. Facies analysis of sedimentary rocks, mapping of folded and faulted sedimentary strata and fabric analysis of an igneous-metamorphic terrane. Excursion to Yellowstone and Grand Teton National Parks. Prerequisite: Geology [GEOL] 2350, 4150, and 3800.

**GEOL 7002. Topics in Geological Sciences-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary. May be repeated with departmental consent. Prerequisite: graduate standing and instructor's consent.

**GEOL 7085. Problems in Geological Sciences. 1-8 Credit.**

Prerequisites: graduate standing and instructor's consent.

**GEOL 7100. Groundwater Hydrology. 3 Credits.**

Analysis of groundwater occurrence, flow, recovery, and solute transport within shallow levels of the Earth's crust. Prerequisites: Geology [GEOL] 1100 or 1200, Physics [PHYSICS] 1210, Mathematics [MATH] 1400 or 1500; graduate standing required.

**GEOL 7110. Karst Hydrology. 3 Credits.**

Study of the mechanisms of groundwater flow in Karst terrains. Emphasizing several scales including that of a conduit, a catchment, and regional framework. Prerequisite: instructor's consent; graduate standing required.

**GEOL 7120. Engineering Geology. 3 Credits.**

Fundamentals of earth materials and geological processes and their applications in engineering works and environmental sciences. Includes properties of minerals and rocks, rock and soil mechanics, surficial geological processes, and practice of engineering. Prerequisite: graduate standing and Geology [GEOL] 1100 or 1200 and Mathematics [MATH] 1700 or 2100, or instructor's consent.

**GEOL 7130. Groundwater Modeling. 3 Credits.**

Use of leading groundwater flow and contamination modeling software. Theory of groundwater flow, solute transport, and selected numerical solution techniques. Applications to water resource, environmental, and geological problems. Prerequisite: Geology [GEOL] 4100 or equivalent.

**GEOL 7150. Structural Geology. 4 Credits.**

The mechanical behavior of earth materials. Analysis of the geometry and mechanics of faults, fractures, and folds. Laboratory includes problems on stresses and strains associated with deformation, geometric analysis of deformation structures, and interpretation of geologic maps. Prerequisites: graduate standing, instructor's consent and Geology [GEOL] 1100 or 1200 and Mathematics [MATH] 1500 or 1400.

**GEOL 7180. Solar System Science. 3 Credits.**

(same as Physics [PHYSICS] and Astronomy [ASTRON] 7180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution. Prerequisites: Mathematics [MATH] 1700 and Physics [PHYSICS] 1220 or 2760 or instructor's consent.

**GEOL 7200. Economic Geology with Laboratory. 4 Credits.**

Geochemistry of ore deposits. Introduction to types of mineral deposits, genesis of ore, and current areas of research. Laboratory emphasizes hand-specimen and polished-section studies of a wide variety of ore deposit types. Prerequisites: Geology [GEOL] 3900.

**GEOL 7210. Marine Geology. 3 Credits.**

Comprehensive examination of the geology of the oceans. Topics includes techniques of data collection and interpretation, physical oceanography, origin of marine sediments, marine tectonics, and ocean history. Prerequisites: graduate standing and Geology [GEOL] 3800 Chemistry [CHEM] 1330 and Physics [PHYSICS] 1220.

**GEOL 7300. Introduction to Low-Temperature Geochemistry. 3 Credits.**

Introduction to the chemical alteration of rock-forming minerals in weathering environments and to factors controlling the chemical composition of subsurface water. Prerequisites: Geology [GEOL] 3300 or instructor's consent; graduate standing required.

**GEOL 7318. Environmental Soil Chemistry. 3 Credits.**

(same as Soils [SOIL] and Environmental Science [ENV\_SC] 7318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes. Prerequisites: SOIL 2100 or Geology [GEOL] 2400, Chemistry [CHEM] 1320 and CHEM 1330. Graduate standing or instructor's consent.

**GEOL 7400. Geomicrobiology and Microbial Biogeochemistry. 3 Credits.**

Roles of microbes in a variety of geological settings through time. Microbial roles in degradation of organic pollutants and transformation of toxic metals and radionuclides in contaminated environments. Prerequisite: Geology [GEOL] 3300 or instructor's consent; graduate standing required.

**GEOL 7500. Organic Geochemistry. 3 Credits.**

Topics include chemistry of petroleum-forming reactions and their kinetic parameters; use of organic-chemical criteria in source-rock evaluation; carbon isotope fractionation in organic precursors of biological molecules; early history of earth's atmosphere. Prerequisite: graduate standing and instructor's consent.

**GEOL 7650. Plate Tectonics. 3 Credits.**

Formation, evolution, and structure of the earth. Rules, causes, and implications of plate tectonics with emphasis on present-day features. Prerequisites: Geology [GEOL] 3250, 4150 or instructor's consent.

**GEOL 7680. Neotectonics and Earthquake Geology. 3 Credits.**

Introduction to techniques and concepts of active crustal deformation from the geological and geodetic perspectives. Topics include tectonic geomorphology, paleoseismology, Quaternary dating, tectonic geodesy, numerical models of faults, and earthquake hazard assessment. Prerequisite: Geology [GEOL] 4650 or 4150.

**GEOL 7700. Theoretical Geochemistry. 3 Credits.**

Introduction to theoretical concepts in low and high temperature geochemistry. Topics include thermodynamics of fluids, gases and solids in geological materials, phase diagrams, equilibrium constants, electrolyte theory, oxidation-reduction reactions. Prerequisites: graduate standing and Geology [GEOL] 3250, Chemistry [CHEM] 1330 and Mathematics [MATH] 1700.

**GEOL 7800. Introduction to Geophysics. 3 Credits.**

Introduction to the fundamentals of geophysical methods and their applications in geology, environmental studies, and exploration. Topics include seismic, gravity, magnetic, and electric methods. Prerequisite: graduate standing and Physics [PHYSICS] 1210 or 2750 and Mathematics [MATH] 1700.

**GEOL 7990. Research in Geological Sciences-Masters. 1-8 Credit.**  
Does not lead to dissertation.

**GEOL 7991. Investigation of Earth Materials. 3 Credits.**

Hands-on experience in all facets of quantitative field and laboratory analyses of near-surface earth materials. Prerequisite: graduate standing Geology [GEOL] 2350, 4100, and 3800.

**GEOL 8002. Topics in Geological Sciences. 3 Credits.**

Organized study of selected topics. May be repeated with departmental consent. Prerequisites: PhD standing, instructor's consent.

**GEOL 8050. Research in Geological Sciences-Masters Non-Thesis. 1-3 Credit.**

Research leading to a non-thesis Masters project. Graded on S/U basis only.

**GEOL 8085. Problems in Geological Sciences. 1-8 Credit.**

Prerequisites: graduate standing and instructor's consent.

**GEOL 8090. Research in Geological Sciences-Masters Thesis. 1-99 Credit.**

Preparation of dissertation. Graded on a S/U basis only.

**GEOL 8100. Continental Tectonics. 3 Credits.**

The structural, metamorphic, and igneous evolution of mountain belts and continental rifts with emphasis on convergent margin settings and terrane accretion processes and products. Case studies are considered from the Precambrian to the recent. Prerequisites: Geology [GEOL] 4150 and 3900.

**GEOL 8140. Metamorphic Petrology. 3 Credits.**

Petrography and petrology of metamorphic rocks. Emphasis on textures, mineral assemblages, and mineral chemistry in order to determine the physico-chemical condition of metamorphism. Prerequisites: Geology [GEOL] 3250 and 3900.

**GEOL 8150. Earthquake Seismology. 3 Credits.**

Theory and techniques used in analyzing earthquake seismograms and seismicity data. Ray theory and phase identification for the whole earth. Epicenter determination. Frequency-magnitude relationships. Earthquake source mechanisms and parameters. Prerequisites: Geology [GEOL] 4320.

**GEOL 8160. Igneous Petrology. 3 Credits.**

Studies of the origin and evolution of magmas with use of phase equilibria, physical properties, and kinetics. Prerequisites: Geology [GEOL] 3250 and 3900.

**GEOL 8170. Radiogenic Isotope Geochemistry. 3 Credits.**

Studies of the application of trace element and radiogenic isotope systematics to petrogenesis of rocks. Prerequisites: Geology [GEOL] 3900.

**GEOL 8190. Advanced Paleontology. 3 Credits.**

Principles of taxonomy, biostratigraphy, functional morphology and paleoecology are illustrated by individual projects that combine field collecting, laboratory examination and literature research. Prerequisite: Geology [GEOL] 3500.

**GEOL 8200. Advanced Structural Geology. 3 Credits.**

Advanced analysis of deformation structures in rocks. Theory and techniques of stress and strain analysis and their application to the mechanics of formation of faults, folds, shear zones, and rock fabric. Techniques of multideformation structural analysis. Prerequisite: Geology [GEOL] 4150/7150.

**GEOL 8210. Advanced Aqueous Geochemistry. 3 Credits.**

Study of mineral-water interface geochemistry. Course will cover dissolution and precipitation kinetics, sorption reactions, and current theories. Prerequisites: Geology [GEOL] 4300/7300 or instructor's consent.

**GEOL 8230. Groundwater and Subsurface Geomicrobiology. 3 Credits.**

Distribution of microorganisms in subsurface environments and the effects of microbial activity on groundwater chemistry. In situ bioremediation of contaminated aquifers by subsurface microorganisms. Prerequisite: Geology [GEOL] 4400.

**GEOL 8240. Hydrogeologic Processes. 3 Credits.**

Quantitative analysis of role of groundwater in major geologic processes. Theory review of fluid flow, heat transport, reactive solute transport in porous media. Applications to sedimentary diagenesis, hydrothermal ore deposits, petroleum migration, earthquakes, magmatism, metamorphism. Prerequisite: Geology [GEOL] 4100/7100 or equivalent.

**GEOL 8300. Precambrian History. 3 Credits.**

Evolution of the coupled ocean, atmosphere, and biological systems over the span of Precambrian history. Topics will be discussed in the context of tectonic models and crustal evolution with a focus on geochemical/stratigraphic records.

**GEOL 8320. Introduction to Seismology. 3 Credits.**

Principles of wave propagation in layered elastic media. Applications of digital signal processing to seismological problems. Emphasis on theoretical basis behind modern analysis techniques. Prerequisites: graduate standing and Physics [PHYSICS] 2760, Mathematics [MATH] 4500 and Computer Science [CMP SC] 1050.

**GEOL 8350. Marine Chemistry. 3 Credits.**

Survey of biogeochemical processes in shallow and deep marine settings. Topics include sediment diagenesis, geochemical tracers, nutrient patterns and pathways, global biogeochemical cycles, paleoceanographic proxy records, and integrated paleoenvironmental reconstructions of ancient marine sequences.

**GEOL 8400. Ancient Greenhouse Climate. 3 Credits.**

Will explore a wide range of data concerning greenhouse climates and different techniques used in paleoclimatology. Graded on A/F basis only. Prerequisites: Geology [GEOL] 3800, 3500 and 4300.

**GEOL 8450. Tectonics and Sedimentation. 3 Credits.**

Global survey of modern and ancient convergent plate boundaries with an emphasis on sedimentary facies and structural styles. Prerequisites: Geology [GEOL] 4150/7150, 3800 and instructor's consent.

**GEOL 8510. Geodynamics. 3 Credits.**

This course is designed to cover the fundamentals of the quantitative aspects of Plate Tectonics. The study of these subjects is generally referred to as Geodynamics or Geodynamic Theory. This theory revolutionized the earth sciences and the way people think of earth processes. By definition Geodynamics is an interdisciplinary paradigm therefore it is necessary to cover a wide range of topics from heat transfer to gravity. This course will overlap with subjects covered in both Plate

Tectonics and Geophysics but we will emphasize the quantitative aspects of this theory in this course. Prerequisites: MATH 1700, PHYSICS 2760.

**GEOL 8550. Stable Isotope Geochemistry. 3 Credits.**

Mechanisms and fundamental concepts of fractionation of light stable isotopes in nature. Emphasizes application of hydrogen, carbon, oxygen and sulfur isotopes to igneous, metamorphic and sedimentary rocks, metallic ore deposits, and to natural waters. Prerequisites: instructor's consent.

**GEOL 8600. Quaternary Environments. 3 Credits.**

Study of the Earth's most recent glacial/interglacial cycles. Prerequisites: instructor's consent.

**GEOL 8650. Thermal Processes in the Solid Earth. 3 Credits.**

Principles of heat transfer in solid earth by conduction, advection and convection. Basic analytic and numerical solutions. Application in Earth's dynamic system, environmental sciences, and geological problems. Prerequisites: Mathematics [MATH] 1700, Physics [PHYSICS] 1220 or 2750.

**GEOL 8750. Silicate Glasses, Liquids and Magmas. 3 Credits.**

Theory of silicate liquid viscosity, heat capacity and configurational entropy, emphasizing the role of volatile components. Applications to magma rheology and eruptive behavior. Lab instruction in viscometry techniques. Prerequisites: Geology [GEOL] 3900 and 4700, or instructor's consent.

**GEOL 8800. Applied Numerical Analysis. 3 Credits.**

A study of applied mathematical analysis of spatial and temporal data as applied in the geosciences. Prerequisites: Mathematics [MATH] 1700 or MATH 2300, Physics [PHYSICS] 1220 or PHYSICS 2760.

**GEOL 8990. Research. 1-8 Credit.**

Does not lead to dissertation.

**GEOL 9090. Research in Geological Sciences-Doctoral Dissertation. 1-99 Credit.**

Preparation of dissertation. Graded on a S/U basis only.

## German (GERMAN)

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**GERMAN 1100. Elementary German I. 5 Credits.**

For beginners with no prior knowledge of German. This course helps learners develop the skills they need to use German as a means of communication in their personal and professional life. It covers a wide variety of vocabulary pertaining to everyday life; emphasis is on all types of communication--oral and listening skills, reading and writing.

**GERMAN 1100H. Elementary German I - Honors. 5 Credits.**

This course is designed for Honors students with little or no German language background and will provide students with a foundation in vocabulary and grammar in order to develop communication proficiency in German. Students will be trained using the five skills: listening, speaking, writing, reading and cultural knowledge. The course will be taught as a total immersion class and thus differs from the standard elementary German sequence. Furthermore, students will be required to complete lengthier reading and writing tasks as well as present a final oral multimedia project at the end of the semester. Honors eligibility required.

**GERMAN 1150. Freshman Introduction to German Studies. 1 Credit.**

Introduction to German Studies as academic field. Small seminar setting with senior faculty, their favorite texts, and questions pursued in the

research and teaching. Recommended for all students interested in integrating German studies into their academic career, conducted in English. Restricted to Freshman students only.

**GERMAN 1200. Elementary German II. 5 Credits.**

A continuation of GERMAN 1100. This course helps learners develop the skills they need to use German as a means of communication in their personal and professional life. It covers a wide variety of vocabulary pertaining to everyday life; emphasis is on all types of communication - oral and listening skills, reading and writing. Prerequisite: C- or better in GERMAN 1100, or equivalent.

**GERMAN 1200H. Elementary German II - Honors. 5 Credits.**

This course is designed for Honors students who either took the German 1100H section or are placing into German 1200 as honors eligible students. The main focus of this course is on further development of basic communication skills in speaking, listening, reading, and writing in German adding more nuanced cultural and sociolinguistic competencies in a total immersion environment. Honors eligibility required.

**GERMAN 2001. Undergraduate Topics in German-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. May be repeated with departmental consent.

**GERMAN 2005. Undergraduate Topics in German-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. May be repeated with departmental consent. No language credit.

**GERMAN 2100. Intermediate German I. 3 Credits.**

A continuation of German [GERMAN] 1200. This course helps learners develop the skills they need to use German as a means of communication in their personal and professional life. It covers a wide variety of vocabulary pertaining to everyday life; emphasis is on all types of communication - oral and listening skills, reading and writing. Prerequisite: C- or better in German [GERMAN] 1200, or equivalent.

**GERMAN 2260. Intermediate German II: Language and Culture. 3 Credits.**

This course continues to help learners develop the necessary communicative skills in German. The particular emphasis is on oral and writing skills, and texts that provide insight into contemporary German culture and social life. Prerequisite: C- in German [GERMAN] 2100 or equivalent.

**GERMAN 2310. German Civilization: Beginning to 1850. 3 Credits.**

Major historical, social, artistic, literary themes from beginnings to end of Revolution of 1848. Films and recordings. May be taken independently of German [GERMAN] 2320. No foreign language credit.

**GERMAN 2320. German Civilization: 1850 to Present. 3 Credits.**

Second Empire, Weimar Republic, Nazi era, two Germanies after 1949. Historical, social, artistic, literary themes. Films and recordings. May be taken independently of German [GERMAN] 2310. No foreign language credit.

**GERMAN 2480. Monstrous Births: Tales of Creation in 19th Century Literature. 3 Credits.**

Examines literary and other cultural works which explore the creation of human beings by traditional, technological, or magical means. Course and readings in English translation. Prerequisites: English [ENGLSH] 1000 or equivalent.

**GERMAN 2820. Trends in World Cinema. 3 Credits.**

(same as Film Studies [FILM\_S] 2820 and Romance Languages [RM\_LAN] 2820). This course is a historical overview of the major trends in international cinema. It focuses on the intersection of aesthetics, industry, and ideological and social concerns in cinematic production. Prerequisite: sophomore standing, English [ENGLSH] / Film Studies [FILM\_S] 1800 or instructor's consent.

**GERMAN 3001. Topics in German-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisites: sophomore standing and instructor's consent.

**GERMAN 3005. Topics in German-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisites: sophomore standing and instructor's consent.

**GERMAN 3160. German Conversation and Composition. 3 Credits.**

This course expands communicative competence in German and provides a review of advanced grammar concepts. Primary emphasis is on the further development of oral and written skills, reading comprehension, vocabulary expansion, and a broad exposure to relevant topics of contemporary German culture and society. Conducted in German. Prerequisite: German [GERMAN] 2260, or equivalent.

**GERMAN 3180. Business German. 3 Credits.**

Examines language within the economic and professional context of German-speaking countries. Introduces different economic concepts of Germany's turbulent 20th century, modern-day business systems and everyday commercial activities such as job applications, professional routines, capital investment and banking. Provides students with vocabulary, cultural knowledge and communicative abilities in order to participate in the professional German-speaking world using linguistically-solid and stylistically-persuasive writing and speaking skills. Prerequisite: German [GERMAN] 2260 and 3230 or equivalent.

**GERMAN 3190. Contemporary German Culture. 3 Credits.**

This content-driven course provides insights into essential subjects of 20th century German history and contemporary society, using a variety of literature, journalistic sources and film. The course will improve German conversation and literacy skills, and will strengthen critical reading and writing, as well as interpretative abilities. Significant grammatical concepts will be throughout the semester. Conducted in German. Prerequisites: German [GERMAN] 2260 or instructor's consent.

**GERMAN 3230. Introduction to German Literature. 3 Credits.**

This course introduces students to German-language literary texts, images, and films in their cultural and historical context through exposure to major genres (poetry, drama, short stories, and the novel). It further builds their vocabulary and teaches them critical interpretive skills as preparation for the analysis of literary texts in upper-division courses - and in life. Prerequisite: C- or better in German [GERMAN] 3160, or 3190.

**GERMAN 3320. Readings in German Literature. 3 Credits.**

Readings in English of selected works of German literature from Goethe to the present, with a particular emphasis on writers and texts that have had a strong influence on European thought and culture. Prerequisite: sophomore standing, English [ENGLSH] 1000.



**GERMAN 3440. After the Fact: Holocaust in Contemporary History, Art & Literature. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3440). Explores responses to the Holocaust from numerous perspectives. Considers how the Holocaust is remembered, memorialized, and debated in a variety of national contexts. Touches on historical, philosophical, and aesthetic points of view. Prerequisites: sophomore standing or instructor's consent.

**GERMAN 3460. Marx & Nietzsche: Labor, Power, & the German Mind of 19th Century. 3 Credits.**

Examines writings of Germany's two most radical nineteenth-century thinkers. Explores key terms of political economy and philosophy developed by Marx and Nietzsche. Journal and three papers. Prerequisite: sophomore standing, English [ENGLSH] 1000.

**GERMAN 3510. Think Global: Fundamentals of Globalization and Digital Technologies. 3 Credits.**

(same as JOURN 3510 and PEA\_ST 3510). This interdepartmental course serves as the introductory seminar for students pursuing the Certificate of Digital Global Studies. The course focuses on the impact of technological change and globalization on cultures around the world from various interdisciplinary perspectives.

**GERMAN 3510H. Think Global: Fundamentals of Globalization and Digital Technologies - Honors. 3 Credits.**

(Same as JOURN 3510H). This interdepartmental course serves as the introductory seminar for students pursuing the Certificate of Digital Global Studies. The course focuses on the impact of technological change and globalization on cultures around the world from various interdisciplinary perspectives. Prerequisite: Honors eligibility required.

**GERMAN 3520. Folk and Fairytales in a Global Context. 3 Credits.**

Analyzes the most famous European collection of fairytales, namely the Kinder-und Hausmarchen (Children's and Household Tales) by the Brothers Grimm and juxtaposes them to folktales from other cultures. Looks at the genre of fairytales, studies the historical context of the genesis of the collection of tales, and modern versions of the tales. Compares and contrasts Grimm's fairytales with folktales of different cultural traditions, analyzes and identifies the formal structure of fairytales and motifs, discusses various interpretive models/perspectives and juxtaposes several historical and contemporary literary fairytales and fairytale adaptations. Cultural unit examples will be on Mongolian culture and history and the Maori culture of New Zealand. Students are expected to create their own cultural unit based on the course's units. Course is taught in English. Prerequisite: Sophomore standing required.

**GERMAN 3830. History of the German Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3830). Introduction to the development of the German film. Old and recent films are viewed and discussed in terms of techniques, artistry, psychology and social impact. English dubbing or subtitles. No foreign language credit. Prerequisites: sophomore standing or instructor's consent.

**GERMAN 3840. German Film After 1945. 3 Credits.**

(same as Film Studies [FILM\_S] 3840). Examines a selection of post-War films by German directors, as well as historical, literary, and theoretical texts. Prerequisite: sophomore standing, or instructor's consent.

**GERMAN 3865. The Holocaust on Screen. 3 Credits.**

(same as Film Studies [FILM\_S] 3865). This course explores how the Holocaust has been depicted on film in a variety of national and historical contexts. Drawing on films from 1945 to the present, from the U.S., Germany, Poland, France, and Italy, we will consider to what end images

of the Holocaust have been used. Prerequisites: sophomore standing. Graded on A/F basis only.

**GERMAN 3895. Service Learning in German Studies. 2 Credits.**

Service learning offers students a chance to put into practice what they have learned in theory. Students work as teacher-aids or tutors in foreign language/culture classes at area schools. Graded on S/U basis only. Does not meet A&S foundation requirements. Prerequisites: German [GERMAN] 2260, or instructor's consent.

**GERMAN 4001. Topics in German-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisites: junior standing and instructor's consent.

**GERMAN 4005. Topics in German-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisites: junior standing and instructor's consent.

**GERMAN 4070. Intensive Beginning German. 3 Credits.**

Designed to lead to a reading knowledge of German. Cannot be taken to fulfill undergraduate language requirement. Prerequisites: graduate standing or instructor's consent.

**GERMAN 4160. Advanced Language Proficiency. 3 Credits.**

A course for intermediate to advanced students of German. This course helps learners develop further the necessary communicative skills in German. The particular emphasis is on oral and writing skills, and texts that provide insight into contemporary German culture and social life. Prerequisite: German [GERMAN] 3230, or equivalent.

**GERMAN 4180. Advanced German: Conversation and Stylistics. 3 Credits.**

This course continues to emphasize all communicative skills in German: oral and listening skills, reading and writing. There is also an emphasis on advanced grammar. The content focuses on contemporary German culture and social life. Prerequisite: senior or graduate standing, or instructor's consent.

**GERMAN 4220. Eerie Tales: Classic German Narratives. 3 Credits.**

In this class, we will read classic uncanny tales in German by major authors, and will explore the traits of this category across a variety of literary movements. Prerequisites: German [GERMAN] 3230 or equivalent language capacity.

**GERMAN 4230. Enlightenment and Revolution. 3 Credits.**

Reading and discussion of selected works by major German writers from 1740 to 1870. Prerequisite: German [GERMAN] 3230 or equivalent.

**GERMAN 4240. Modernism and Modernity. 3 Credits.**

Reading and discussion of selected works by major German writers from 1870 to the present. Prerequisite: German [GERMAN] 3230 or equivalent.

**GERMAN 4260. Recent German Literature. 3 Credits.**

This course examines 'post-unification' works (i.e. by formerly East and West German authors) of literature and film written since 1989 that addresses social and political changes leading to or resulting from unification and the experience of WWII. Students will analyze the diverse cultural, political and economic factors that influence writers and filmmakers whose aesthetic production in turn helps shape contemporary German society.

**GERMAN 4440. Enlightenment and Sturm und Drang. 3 Credits.**

Survey of literature and thought of 18th-century Germany, with emphasis on the works of Lessing, Wieland, Herder and the younger Goethe. Prerequisite: German [GERMAN] 4230 or equivalent.

**GERMAN 4450. German Romanticism. 3 Credits.**

Prerequisite: German [GERMAN] 4230 or equivalent.

**GERMAN 4530. The German Novelle. 3 Credits.**

Prerequisite: German [GERMAN] 4230 or equivalent.

**GERMAN 4650. Faust. 3 Credits.**

Prerequisite: German [GERMAN] 4230 or equivalent.

**GERMAN 4670. Medieval German Literature 1170-1210. 3 Credits.**

Analysis of major narrative and lyric poetry of the Age of Chivalry. Prerequisite: German [GERMAN] 4230 or equivalent.

**GERMAN 4730. German Internship and Methods. 3 Credits.**

Supervised introduction to the methodology of the teaching of elementary German; conducted in a classroom environment. Prerequisites: junior standing, German [GERMAN] 4230, or instructor's consent.

**GERMAN 4820. Blogging the World: The Web in Cultural Context. 3 Credits.**

(same as French [FRENCH] and Russian [RUSS] 4820). Innovative interdisciplinary course addresses issues of access to international news and specific cultural context working in cross-disciplinary teams. Students in journalism, foreign language, international studies, political science and various other disciplines track cultural developments and information on non-US Web sites, blogs and digital social networks along with exploring various historical forms of communication that preceded the digital era of the Web. Students analyze the potential and limitations/ effects of blogs and the web in specific contemporary cultural contexts and as part of the broader historical evolution of the web. The course is taught in English. The goal of this course is two-fold; students learn the particulars of web blogging, explore various features of the contemporary social network landscape while focusing on the concept of culture, in particular the cultures of Europe and the US. Questions asked are: what is culture? What is common or popular right now in other cultures? And how do new social networks amplify or alter certain features or culture across national and international contexts? Prerequisite: sophomore standing required.

**GERMAN 4960. Special Readings in German. 1-3 Credit.**

Independent study through readings, conferences, and reports. Prerequisites: junior standing and instructor's consent.

**GERMAN 4980. German Capstone Seminar. 3 Credits.**

Required of all senior German majors. Focuses on contemporary Germany and brings together aspects of German literature and culture studies during the degree program. Prerequisites: senior standing, one 3000-level literature course or equivalent or departmental consent.

**GERMAN 4996. Honors in German. 1-3 Credit.**

Special problems in Germanic literature or linguistics. Prerequisite: consent of departmental Honors director.

**GERMAN 7001. Topics in German-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent.

**GERMAN 7005. Topics in German - Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent.

**GERMAN 7085. Problems in German. 1-3 Credit.**

Prerequisites: graduate standing and chairman's consent.

**GERMAN 7160. German Conversation and Composition III. 3 Credits.**

A course for intermediate to advanced students of German. This course helps learners develop further the necessary communicative skills in German. The particular emphasis is on oral and writing skills, and texts that provide insight into contemporary German culture and social life. Prerequisite: graduate standing and German [GERMAN] 3130 or equivalent.

**GERMAN 7180. Advanced German: Conversation and Stylistics. 3 Credits.**

This course continues to emphasize all communicative skills in German: oral and listening skills, reading and writing. There is also an emphasis on advanced grammar. The content focuses on contemporary German culture and social life. Prerequisite: senior or graduate standing, or instructor's consent.

**GERMAN 7440. Enlightenment and Sturm und Drang. 3 Credits.**

Survey of literature and thought of 18th-century Germany, with emphasis on the works of Lessing, Wieland, Herder and the younger Goethe. Prerequisite: graduate standing or German [GERMAN] 3630 or equivalent.

**GERMAN 7530. The German Novelle. 3 Credits.**

Prerequisite: graduate standing and German [GERMAN] 3630 or equivalent.

**GERMAN 7650. Faust. 3 Credits.**

Prerequisite: graduate standing and German [GERMAN] 3630 or equivalent.

**GERMAN 7660. Recent German Literature. 3 Credits.**

Prerequisite: graduate standing and German [GERMAN] 3630 or equivalent.

**GERMAN 7670. Medieval German Literature 1170-1210. 3 Credits.**

Analysis of major narrative and lyric poetry of the Age of Chivalry. Prerequisite: graduate standing and German [GERMAN] 3630 or equivalent.

**GERMAN 7730. German Internship and Methods. 3 Credits.**

Supervised introduction to the methodology of the teaching of elementary German; conducted in a classroom environment. Prerequisites: graduate standing and German [GERMAN] 3630, or instructor's consent.

**GERMAN 7820. Blogging the World: The Web in Cultural Context. 3 Credits.**

(same as Russian [RUSS] 7820 and French [FRENCH] 7820). Innovative interdisciplinary course addresses issues of access to international news and specific cultural context. Working in cross-disciplinary teams, students in journalism, foreign language, international studies, political science and various other disciplines track cultural developments and information on non-US Web sites, blogs and digital social networks along with exploring various historical forms of communication that preceded the digital era of the Web. Students analyze the potential and limitations/ effects of blogs and the web in specific contemporary cultural contexts and as part of the broader historical evolution of the web. The course is taught in English. The goal of this course is two-fold: students learn the particulars of web blogging, explore various features of the contemporary social network landscape while focusing on the concept of culture, in particular the cultures of Europe and the US. Questions asked are: what is culture? What is common or popular right now in other cultures? And

how do new social networks amplify or alter certain features or culture across national and international contexts?.

**GERMAN 7960. Special Readings in German. 1-3 Credit.**

Independent study through readings, conferences, and reports. Prerequisites: graduate standing and instructor's consent.

**GERMAN 7980. German Capstone Seminar. 3 Credits.**

Required of all senior German majors. Focuses on contemporary Germany and brings together aspects of German literature and culture studies during the degree program. Prerequisites: graduate standing, one 3000-level literature course or equivalent, or departmental consent.

**GERMAN 8001. Topics in German-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent.

**GERMAN 8005. Topics in German - Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent.

**GERMAN 8007. SEMINAR:GERMAN. 3 Credits.**

**GERMAN 8050. Research in German. 1-3 Credit.**

Translations or creative work not leading to thesis. Credit hours arranged. Prerequisites: graduate standing or departmental consent.

**GERMAN 8085. Problems in German. 1-3 Credit.**

Prerequisites: graduate standing and chairman's consent.

**GERMAN 8087. Seminar in German. 3 Credits.**

Course content varies. Prerequisites: graduate standing or instructor's consent.

**GERMAN 8090. Research in German. 1-3 Credit.**

Prerequisite: graduate director's consent. Graded on S/U basis only.

**GERMAN 8450. Reformation and Renaissance Literature. 3 Credits.**

The course investigates significant works of German literature of the late 15th and 16th Centuries. Prerequisites: graduate standing or instructor's consent.

**GERMAN 8520. German Poetry from Sturm und Drang to 1848. 3 Credits.**

Reading of selected poetry by German writers of Sturm und Drang, Classicism, Romanticism, and Vomarz.

**GERMAN 8615. History of the German Language. 3 Credits.**

(same as Linguistics [LINGST] 8615). Prerequisites: graduate standing or instructor's consent.

**GERMAN 8625. Middle High German. 3 Credits.**

(same as Linguistics [LINGST] 8625). Prerequisites: graduate standing or instructor's consent.

## Graduate School (GRAD)

**GRAD 4010. Preparing To Be A Graduate Teaching Assistant. 1 Credit.**

Provides an understanding of the roles and responsibilities of teaching assistants to prepare students for graduate school. Learning will take place through observation, lecture, reading and discussion. Graded on S/U basis only.

**GRAD 7010. Preparing To Be A Graduate Teaching Assistant. 1 Credit.**

Provides an understanding of the roles and responsibilities of teaching assistants to prepare students for graduate school. Learning will take place through observation, lecture, reading and discussion. Graded on S/U basis only. Prerequisite: graduate standing.

**GRAD 7020. Learning Across Borders Seminar. 1 Credit.**

Social, cultural, and economic problems--and their solutions--are increasingly global and interdisciplinary. Global awareness is essential, therefore, in order to compete in the increasing global marketplace. Coupling professional knowledge and skills with international experience gives graduates a competitive advantage, as employers look beyond the academic transcript for additional skills. The Learning Across Borders seminar (LAB) creates opportunities for graduate students to work across cultures and disciplines. Throughout the academic year students will participate in a series of Think Tanks (interactive discussions facilitated by MU faculty and special guests) and LAB-approved events. Prerequisites: Students must register for both semesters. Graded on S/U basis only.

**GRAD 7070. Academic Interactions in the American University. 3 Credits.**

This course is designed to give graduate students new to the western academic environment an overview of classroom and departmental activities and expectations. Specifically, it will give students cultural insight into academic tasks and some of the linguistic tools necessary to accomplish those tasks. This course is recommended for any students who have not previously studied in a western academic environment and strongly recommended for students with an overall TOEFL score of 80 or below or sub-scores in listening and/or speaking of 20 or less. Prerequisites: ibt TOEFL of 60, graduate standing required.

**GRAD 7302. Tools for Teaching American Students. 3 Credits.**

Emphasis on advanced academic listening, discrete pronunciation skills, techniques for laboratory teaching and one-to-one interactions. Integrated with a general overview of American classroom culture.

**GRAD 7303. Communication and Culture for American College Teaching. 3 Credits.**

This class will focus on the linguistic aspects of teaching, as well as specific pedagogical; and cultural aspects of the American classroom. It will emphasize fluency development at the suprasegmental level, and interactive teaching skills, like organizational, questioning and compensation strategies.

**GRAD 9001. Topics in Graduate School. 1-99 Credit.**

Organized study of selected professional and career development topics. Subjects and course credit may vary from semester to semester. Prerequisite: instructor's and academic advisor's consent.

**GRAD 9010. Preparing Future Faculty I. 1 Credit.**

First course in a two-semester Preparing Future Faculty program that introduces Ph.D. students to a variety of faculty roles and work environments. Prerequisite: instructor's consent. Graded on S/U basis only.

**GRAD 9020. Preparing Future Faculty II. 1 Credit.**

Second course in a two-semester Preparing Future Faculty program that introduces Ph.D. students to a variety of faculty roles and work environments. Topics build upon those presented in Graduate School [GRAD] 9010 and focus on the job search and career development processes. Prerequisite: GRAD 9010. Graded on S/U basis only.

**GRAD 9030. Teaching with Technology-Strategies for Your Online Classroom. 1 Credit.**

(same as Information, Science and Learning Technology [IS\_LT] 9477). Designed to assist current and future course instructors to integrate learning technologies into a traditional face-to-face course. Graded on A/F basis only.

**GRAD 9304. Instructional and Communication Strategies for Effective College Teaching. 3 Credits.**

This class will focus on teaching and presentation strategies such as lesson design, using case studies and problem based learning, interactive learning, and classroom and course management. The linguistic emphasis will be on reduction, linking and speech patterns as well as pragmatic issues of organizing, clarifying and emphasizing ideas. Requires an MU Oral Language Proficiency Assessment score of 3 and course consent. Prerequisite: ITAP language level 3P or Graduate School [GRAD] 7303 and level 2; consent required. Graded on A/F basis only.

## **Greek (GREEK)**

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**GREEK 1100. Elementary Ancient Greek I. 5 Credits.**

Study of forms, grammar, syntax. Early attention to reading in simple Attic prose.

**GREEK 1100H. Elementary Ancient Greek I - Honors. 5 Credits.**

Study of forms, grammar, syntax. Early attention to reading in simple Attic prose. Honors eligibility required.

**GREEK 1200. Elementary Ancient Greek II. 5 Credits.**

Continuation of Greek [GREEK] 1100. Readings in Attic prose. Prerequisite: grade of C or higher in Greek [GREEK] 1100 or equivalent.

**GREEK 1200H. Elementary Ancient Greek II - Honors. 5 Credits.**

Continuation of Greek [GREEK] 1100H. Readings in Attic prose. Prerequisite: grade of C or higher in Greek [GREEK] 1100 or equivalent. Honors eligibility required.

**GREEK 2000. Greek Reading. 3 Credits.**

Selected works of Greek literature. Prerequisite: grade of C or higher in Greek [GREEK] 1200.

**GREEK 2000H. Greek Reading - Honors. 3 Credits.**

Selected works of Greek literature. Prerequisite: grade of C or higher in Greek [GREEK] 1200. Honors eligibility required.

**GREEK 4120H. Intensive Beginning Greek II - Honors. 3 Credits.**

Continuation of Greek [GREEK] 4110H. Attention to ability to read rapidly and accurately. Course meets five hours weekly for three hours credit. Prerequisite: graduate standing or Honors eligibility required.

**GREEK 4300. Intermediate Readings. 3 Credits.**

Selected advanced readings in prose and poetry. Introduction to Homer. Prerequisite: Greek [GREEK] 2000 or equivalent.

**GREEK 4350. The Greek New Testament. 3 Credits.**

(same as Religious Studies [REL\_ST] 4650). Readings in the Greek New Testament and similar literature, e.g., the Septuagint. Prerequisite: Greek [GREEK] 4300 or instructor's consent. Graded on A-F basis only.

**GREEK 4400. Homer. 3 Credits.**

Reading, discussion, and literary analysis of Iliad and Odyssey. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4500. Greek Stylistics. 3 Credits.**

Study and practice of Greek prose, with special consideration to basic problems: abstract expression, word order, sentence structure and use of common rhetorical devices.

**GREEK 4505. Topics in Greek. 3 Credits.**

Topics course involving Greek texts. Prerequisites: Greek [GREEK] 4300 or equivalent. May be repeated for credit.

**GREEK 4510. Greek Tragedy. 3 Credits.**

Selected works of Aeschylus, Sophocles, Euripides, with special attention to language, style, ideas, and dramatic techniques. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4520. Greek Comedy. 3 Credits.**

Selected plays of Aristophanes and Menander, with special attention to cultural contexts. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4530. Greek Lyric Poetry. 3 Credits.**

Selected readings from lyric poets, with attention to verse forms, and dialects. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4540. Greek Oratory. 3 Credits.**

Selections from Greek orators, with emphasis on Lysias and Demosthenes. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4550. Greek Philosophers. 3 Credits.**

Emphasis on readings and analysis of selected texts of major Greek philosophers. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4560. Greek Historians. 3 Credits.**

Reading and analysis of selected texts of major Greek historians. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4570. Greek Epigraphy. 3 Credits.**

Introduction to study of Greek inscriptions and their contribution to the understanding of other aspects of ancient culture. Prerequisite: Greek [GREEK] 2000.

**GREEK 4700. Survey of Greek Literature. 3 Credits.**

Greek literature from origins to end of Roman period; emphasis on authors not covered in other courses, to provide general view of styles and genres. Prerequisite: two years Classical Greek or equivalent.

**GREEK 4960. Special Readings in Greek. 3 Credits.**

Readings in authors and texts not covered in other courses. Prerequisites: departmental consent, two years Classical Greek or equivalent.

**GREEK 7300. Intermediate Readings in Greek. 3 Credits.**

Selected advanced readings in prose and poetry. Introduction to Homer. Prerequisite: graduate standing and Greek [GREEK] 2000 or equivalent. Available to students for graduate credit in departments other than Classical Studies.

**GREEK 7350. The Greek New Testament. 3 Credits.**

(same as Religious Studies [REL\_ST] 7650). Readings in the Greek New Testament and similar literature, e.g., the Septuagint. Graduate students read significantly more Greek than do undergraduates and testing is accordingly more rigorous. Prerequisite: graduate standing and Greek [GREEK] 4300 or instructor's consent. Graded on A/F basis only.

**GREEK 7400. Homer. 3 Credits.**

Reading, discussion, and literary analysis of Iliad and Odyssey. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7500. Greek Stylistics. 3 Credits.**

Study and practice of general Greek prose tendencies, with special consideration to basic problems: abstract expression, word order, sentence structure and use of common rhetorical devices. Prerequisite: graduate standing.

**GREEK 7505. Topics in Greek. 1-99 Credit.**

Organized study of selected authors or eras. Subject and earnable credit vary from semester to semester. Prerequisite: graduate standing and two years of Classical Greek or equivalent.

**GREEK 7510. Greek Tragedy. 3 Credits.**

Selected works of Aeschylus, Sophocles, Euripides, with special attention to language, style, ideas, and dramatic techniques. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7520. Greek Comedy. 3 Credits.**

Selected plays of Aristophanes and Menander, with special attention to cultural contexts. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7530. Greek Lyric Poetry. 3 Credits.**

Selected readings from lyric poets, with attention to verse forms, and dialects. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7540. Greek Oratory. 3 Credits.**

Selections from Greek orators, with emphasis on Lysias and Demosthenes. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7550. Greek Philosophers. 3 Credits.**

Emphasis on readings and analysis of selected texts of major Greek philosophers. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7560. Greek Historians. 3 Credits.**

Reading and analysis of selected texts of major Greek historians. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7570. Greek Epigraphy. 3 Credits.**

Introduction to study of Greek inscriptions and their contribution to the understanding of other aspects of ancient culture. Prerequisite: graduate standing and Greek [GREEK] 2000.

**GREEK 7700. Survey of Greek Literature. 3 Credits.**

Greek literature from origins to end of Roman period; emphasis on authors not covered in other courses, to provide general view of styles and genres. Prerequisite: graduate standing and two years Classical Greek or equivalent.

**GREEK 7960. Special Readings in Greek. 1-3 Credit.**

Readings in authors and texts not covered in other courses. Prerequisites: graduate standing and departmental consent, two years Classical Greek or equivalent.

**GREEK 8000. Proseminar in Greek Texts. 3 Credits.**

This is a seminar-level introduction to Greek literary and historical texts. The emphasis in this course will be on wide and intensive reading, with the objective of helping the new graduate student quickly develop a sound literary and linguistic competence.

**GREEK 8010. Greek Rough Guide. 3 Credits.**

Intensive exploration of Greek Literature from its earliest appearance through the Roman period. Emphasis upon texts as both literary and cultural artifacts whose interpretation requires familiarity with the historical

and archaeological legacy of antiquity as well as modern exegetical strategies. Graded on A/F basis only.

**GREEK 8100. Greek Historiography. 3 Credits.**

(same as History [HIST] 8500). Study of the major contemporary historians of Classical Greece and their methodology. Differential readings available to both students with a reading knowledge of Greek and also those without Greek.

**GREEK 9287. Seminar in Greek Drama. 3 Credits.**

May be repeated to a maximum of 6 hours.

**GREEK 9387. Seminar in Greek Lyric Poetry. 1-99 Credit.**

Prerequisite: graduate standing.

**GREEK 9487. Seminar in the Greek Philosophers. 3 Credits.**

Prerequisite: graduate standing.

**GREEK 9587. Seminar in the Greek Historians. 3 Credits.**

Prerequisite: graduate standing.

**GREEK 9687. Seminar in Greek Epic Poetry. 3 Credits.**

Prerequisite: graduate standing.

**GREEK 9787. Seminar on the Age of Pericles. 3 Credits.**

Study of Greek culture of mid-fifth century B.C., including law, religion, art, philosophy, science, and other aspects of the culture, to give students an integrated view of life of the period.

**GREEK 9887. Seminar in Special Fields. 3 Credits.**

Prerequisite: graduate standing.

## Health Management and Informatics (HMI)

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**HMI 2210. The American Health Care System. 3 Credits.**

Student is provided with a basic understanding of the major components (financing, planning, and regulating) of the American health care system. Emphasis is placed on current issues and their impact on the delivery system.

**HMI 3310. The Health Care System. 3 Credits.**

Overview of health care system and relationship between its components. Focuses on changing nature of the system and issues confronting the future health care system. Prerequisite: senior standing.

**HMI 6495. Health Care Management. 5 Credits.**

Health Care Management.

**HMI 7410. Design of Health and Human Service Systems Evaluation. 3 Credits.**

Critical overview of issues, responses, and challenges in health services delivery, population health, and health policy in the U.S. to better respond, organize, deliver, and finance quality, cost-effective health care. Prerequisite: consent required.

**HMI 7420. Fundamentals of Bioinformatics. 3 Credits.**

Fundamentals of Bioinformatics.

**HMI 7430. Introduction to Health Informatics. 3 Credits.**

(same as MU Informatics Institute [INFOINST] 7430). Introduction to the use of clinical information systems in healthcare. Topics include clinical data, standards, electronic medical records, computerized provider order entry, decision support, telemedicine, and consumer applications. Prerequisites: graduate standing, departmental consent.

**HMI 7564. Health Ethics Theory. 3 Credits.**

An introduction to health ethics theory and methodology. We discuss metaethics and normative ethics theories, normative ethics in health ethics and methods of ethics case work up. Graduate standing required.

**HMI 7566. Health Informatics Ethics. 3 Credits.**

An introduction to ethical issues arising in the use of computers and information technology in clinical contexts in health care. Prerequisite: graduate standing, Health Management and Informatics [HMI] 7564 or equivalent course or permission of instructor.

**HMI 7567. Health Organizational Ethics. 3 Credits.**

An introduction to the ethics of administrative, managerial, and related business issues that arise in healthcare organizations. Prerequisites: graduate standing, Health Management and Informatics [HMI] 7564 or equivalent course, or permission of instructor.

**HMI 7750. Physical Function and Older Adults. 3 Credits.**

(Same as Family and Community Medicine [F\_C\_MD] 7750, Architectural Studies [ARCHST] 7640, Human Development and Family Studies [H\_D\_FS] 7750, Nursing [NURSE] 7750, Public Health [P\_HLTH] 7750, and Social Work [SOC\_WK] 7752). This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graded A-F only. Graduate Standing Required.

**HMI 7751. Psychosocial Function and Older Adults. 3 Credits.**

(same as Architectural Studies [ARCHST] 7650, Family Community Medicine [F\_C\_MD] 7751, Human Development and Family Studies [H\_D\_FS] 7751, Nursing [NURSE] 7751, Public Health [P\_HLTH], 7751 and Social Work [SOC\_WK] 7751). This course takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**HMI 8090. Thesis Research in Health Management and Informatics. 3 Credits.**

Research leading to a thesis. Maximum of 9 hours. Prerequisite: Adviser's consent. Graded on S/U basis only.

**HMI 8401. Topics in Health Management and Informatics. 3 Credits.**

Organized study of selected topics. Subjects will vary from semester to semester. Prerequisite: departmental consent for repetition.

**HMI 8435. Information Security, Evaluation and Policy. 3 Credits.**

The purpose of this course is to provide an extensive overview, practical applications and analyses of functionality and usability evaluations of health care information technology, and to discuss the impact of security on the present and future health care settings.

**HMI 8437. Data Warehousing and Data/Text Mining for Health Care. 3 Credits.**

An introduction to the basic concepts of data warehouse and data/text mining, creating an understanding of why we need those technologies and how they can be applied to healthcare problems. Prerequisites: Computer Science [CMP\_SC] 4380/7380, Health Management and Informatics [HMI] 8441.

**HMI 8441. Controlled Terminology Theory and Application. 3 Credits.**

Basic and advanced concepts of controlled terminologies and their use in the representation of biomedical information and knowledge, with emphasis on terminology management in the health care enterprise.

Syntactic and semantic structure of controlled terminologies are examined and a number of representative terminologies are analyzed.

**HMI 8443. Enterprise Information Architecture. 3 Credits.**

Organization and development of infrastructure necessary to support an enterprise information system for patient care. Components of architecture are introduced in a problem-based approach, case examples are presented as the basis for addressing specific attributes of the components, as well as problems facing the design of an enterprise information system for health care.

**HMI 8450. Methods of Health Services Research. 1-99 Credit.**

Writing intensive course provides students with basic understanding of literature search, experimental designs, evaluation methods, ethics, reporting and application of health services research. Practical research problems are discussed and students prepare a professional, managerially relevant research proposal.

**HMI 8460. Administration of Health Care Organizations. 3 Credits.**

Analyzes health care organizations, emphasizing organizational structure, and strategy, and managerial leadership. Topics include governance, adaptation, design, interorganizational networks, and organizational performance.

**HMI 8461. Human Resources Management. 3 Credits.**

Provides a framework for understanding and thinking strategically about employee relations and management of people in organizations, drawing on insights from social sciences to explore how psychological, economic, social, and cultural forces influence human resources management in health care.

**HMI 8470. Strategic Planning and Marketing for Health Care Organizations. 3 Credits.**

Analysis of strategic planning and services management and marketing concepts, techniques, and tools in the health care industry. Includes analyzing the environment, assessing the organization's strengths and weaknesses, formulating strategy to achieve competitive advantage, and implementing strategy through service management and marketing.

**HMI 8472. Financial Management for Health Care Organizations. 3 Credits.**

Application of concepts, tools and techniques of financial management and their interrelationships as they apply to current and future operation of health care organizations. Prerequisites: Accounting and Finance.

**HMI 8478. Knowledge Management in Health Care. 3 Credits.**

Representing clinical terms, concepts and knowledge in a form for manipulation by intelligent systems. Theoretical formalisms and conceptual representations of medical information. Examination of knowledge engineering tools and decision support systems.

**HMI 8485. Problems in Health Management and Informatics. 1-3 Credit.**

Intensive study of an area of health services management. Prerequisites: graduate standing and instructor's consent.

**HMI 8524. Health Economics. 3 Credits.**

Building upon previous knowledge of basic economic theories, concepts, and tools, the structure, organization, activities, functions, and problems of health and medical care are considered from an economics perspective. Prerequisite: microeconomics.

**HMI 8544. Managerial Epidemiology. 1-3 Credit.**

Examination of basic epidemiological concepts and methods as applied to health services management. Equal emphasis on applications of epidemiology to health services planning, quality monitoring, planning,

policy development, system development, finance, and underwriting.  
Prerequisite: consent required.

**HMI 8565. Health Care Ethics. 3 Credits.**

Explores ethics issues and controversies facing clinicians and healthcare administrators. Topics may include end-of-life care, imperiled newborns, maternal-fetal conflict, procreative liberty, genetic screening and enhancement, organ procurement and allocation, rationing, public health, workplace relationships, and conflicts of interest. Prerequisite: graduate standing, Health Management and Informatics [HMI] 7564 or equivalent course, or permission of instructor.

**HMI 8571. Decision Support in Health Care Systems. 3 Credits.**

Applies principles and techniques of computer-assisted decision making to solve health care problems. Clinical and managerial applications of artificial intelligence, including expert systems reviewed. Advantages of integrating decision support programs with databases are discussed.

**HMI 8573. Decision Making for Health Care Organizations. 3 Credits.**

Applies and integrates marketing, operations, human resources, and financial management decision-making in health care organizations. Case studies, role playing exercises, simulations, and games are used to demonstrate the dynamic tension between operations efficiency and marketing effectiveness that characterizes decision-making directed toward achieving organizational financial integrity.

**HMI 8574. Health Care Law. 3 Credits.**

Survey of the function and methods of law as applied to health care administration and health care.

**HMI 8575. Health Policy and Politics. 3 Credits.**

Overview and critical analysis of health policy issues in the United States, including how the dynamics of the policy making process have shaped outcomes, successful and unsuccessful, of a number of important policy initiatives.

**HMI 8610. Consumer Health Informatics. 3 Credits.**

Consumer health informatics explores the branch of medical informatics that analyzes consumers' needs for information; studies and implements methods of making information accessible to consumers; and models and integrates consumers' preferences into medical information systems. Prerequisites: Health Management and Informatics [HMI] 7430/ Informatics Institute [INFO\_INST] 7430 or instructor's consent. Graduate standing required.

**HMI 8689. Field Experience in Health Management and Informatics. 1-99 Credit.**

Supervised field experience in approved health agencies and institutions. Opportunity for observation and service participation in various fields of health. Graded on a S/U basis only.

**HMI 8810. Research Methods in Health and Bioinformatics. 3 Credits.**

(same as Informatics Institute [INFO\_INST] 8810) Research Methods in Health and Bioinformatics is a writing intensive course that provides students with an understanding of research proposal development, literature searching, research synthesis, research designs, evaluation methods, and ethics. Prerequisites: Statistics [STAT] 7450 or 7510. Second semester or later in PhD program or instructors consent. Graduate standing required.

**HMI 8870. Knowledge Representation in Biology and Medicine. 3 Credits.**

(Same as MU Informatics Institute [INFOINST] 8870) The main topics presented in the course are: logic systems, knowledge representation

methods, production systems and representation of statistical and uncertain knowledge. Prerequisites: Computer Science [CMP\_SC] 2050(Java), MU Informatics Institute [INFOINST] 7430. Graduate standing required. Graded A-F only.

**HMI 9440. Technology Evaluation in Health Care Systems Research. 3 Credits.**

(same as NURSE 9470). Examines technology applications and evaluator methods used to determine outcomes, efficiencies, effectiveness, satisfaction, and cost of using technology. May be repeated for credit. Prerequisites: 6.0 credit of graduate statistics; Prerequisite/Corequisite: NURSE 9410 or faculty consent.

## **Health Professions (HTH\_PR)**

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**HTH\_PR 1001. Topics in Health Professions. 1-3 Credit.**

Organized study of selected topics in Health Professions. Particular topics and credit may vary each semester. Prerequisite: instructor's consent.

**HTH\_PR 2001. Topics in Health Professions. 1-99 Credit.**

Organized study of selected topics in health professions. Particular topics and earnable credit may vary from semester to semester. Prerequisite: sophomore standing and instructor's consent.

**HTH\_PR 2960. Special Readings in Health Professions. 1-3 Credit.**

Directed study of literature and research reports in the health-related professions. Prerequisite: instructor's consent.

**HTH\_PR 4085. Problems in Health Professions. 1-99 Credit.**

Prerequisite: instructor's consent.

**HTH\_PR 4250. Human Kinesiology. 3 Credits.**

(same as Physical Therapy [PH\_THR] 4250 and Occupational Therapy [OC\_THR] 4250). Study of principles of physical laws, biomechanics and anatomic structure relative to human movement. Application through analysis of daily functional performance, exercise and sport. Prerequisite: anatomy.

**HTH\_PR 4310. Health Policy for the Health Professional. 1-3 Credit.**

Seminar to facilitate understanding of health policy, the legislative process, and politics. Emphasis on health professions, including issues of workforce, funding, and advocacy in the context of current health policy issues.

**HTH\_PR 7001. Topics in Health Professions. 1-3 Credit.**

Organized study of selected topics in health and/or healthcare. Topic and credit may vary from semester to semester. Prerequisite: instructor's consent.

**HTH\_PR 7300. Health Care in the United States. 3 Credits.**

Overview of financing, structure, and outcomes in the U.S. health care system. Contemporary health care issues, policy, and politics will be addressed. Graded on A/F basis only. Prerequisite: graduate standing.

**HTH\_PR 7310. Health Policy for the Health Professional. 1-3 Credit.**

Seminar to facilitate understanding of health policy, the legislative process, and politics. Emphasis on health professions, including issues of workforce, funding, and advocacy in the context of current health policy issues. Prerequisite: graduate standing.

**HTH\_PR 8001. Topics in Health Professions. 1-3 Credit.**

Organized study of selected topics in health and/or healthcare. Topic and credit may vary from semester to semester. Prerequisite: instructor's consent.

**HTH\_PR 8085. Problems in Health Professions. 1-3 Credit.**

Individual study not leading to thesis or dissertation. Prerequisite: instructor's consent.

**HTH\_PR 8960. Directed Readings in Health Professions. 1-3 Credit.**

Selected readings on specific topics. Prerequisite: instructor's consent.

## Health Sciences (HLTH\_SCI)

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**HLTH\_SCI 1000. Introduction to the Health Professions. 2 Credits.**

Overview of various health science majors and careers, as well as the aptitudes and abilities needed to each career. Presents information regarding current health concerns, topics affecting the current and future state of health care, historical developments and basic information about the U.S. health care system. Assists with career planning and selection of appropriate major. Graded on A/F basis only.

**HLTH\_SCI 2100. Health Sciences Seminar. 1 Credit.**

Professional Development course for Health Science Majors. Topics include resume development/ revision, interviewing skills, applying to graduate/professional programs and/or jobs, professional communication, etc. Prerequisite: sophomore standing required; restricted to Health Science majors only. Graded on S/U basis only.

**HLTH\_SCI 2200. Nuclear Weapons: Environmental, Health and Social Effects. 3 Credits.**

(same as SOCIOL 2281 and PEA\_ST 2200). Environmental consequences of the nuclear arms race, "regional" nuclear war, and weapons testing for human health, agriculture, and society. Examining "a world without nuclear weapons"; political dialogue on proliferation; Iran, North Korea, and nuclear weapons conventions. Graded on A/F basis only.

**HLTH\_SCI 3300. Public Health Principles and Practice. 3 Credits.**

This course focuses on the basic structures of the public health system in the US and provides an introduction to the factors that influence and shape that system including financing, politics and global issues. Restricted to Health Sciences Majors during pre-registration. Graded on an A/F basis only.

**HLTH\_SCI 3400. Global Health. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3401). An introduction to public health in a global context, with an emphasis on understanding how disparities in socioeconomic status, differences in political and national health care systems and the work of international organizations impact health in communities around the world. Graded A-F only.

**HLTH\_SCI 3500. Mental Health. 3 Credits.**

This course provides a look at mental health problems with regard to influences, etiology, diagnosis, and treatment. Students learn theories of mental health, diagnostic criteria, treatment modalities, and community issues concerning the mental health system. Prerequisite: Health Profession [HTH\_PR] 2100. Graded A-F only.

**HLTH\_SCI 3600. Health Promotion Planning. 3 Credits.**

This course will provide a comprehensive introduction to health promotion programming by integrating a solid theoretical foundation of the discipline with hands-on experience in project planning, funding, implementation,

and evaluation. Graded on A/F basis only. Prerequisite: Restricted to Health Science majors during early registration.

**HLTH\_SCI 3900. Introduction to The Research Process and Evidence Base. 3 Credits.**

This course is an introduction to the basic quantitative and qualitative research techniques used in the health professions. Basic elements of research as well as strengths and weaknesses of various methodologies, Institutional Boards, research ethics, research design, validity and reliability will be covered. Restricted to Health Sciences Majors with junior or senior standing. Graded A-F only.

**HLTH\_SCI 4001. Topics in Health Professions. 1-3 Credit.**

Organized study of selected topics. Subjects will vary from semester to semester.

**HLTH\_SCI 4300. Health Care in the United States. 3 Credits.**

Overview of financing, structure, and outcomes in the U.S. health care system. Contemporary health care issues, policy, and politics will be addressed. Restricted to Health Sciences Majors during pre-registration. Graded on A/F basis only.

**HLTH\_SCI 4300H. Health Care in the United States - Honors. 3 Credits.**

Overview of financing, structure, and outcomes in the U.S. health care system. Contemporary health care issues, policy, and politics will be addressed. Graded on A/F basis only. Honors eligibility required.

**HLTH\_SCI 4400. Culture and Health Literacy for the Health Professions. 3 Credits.**

This course will explore differences and attitudes towards the health care industry across various social, cultural and ability groups. This exploration will result in more culturally competent health professionals by promoting self-awareness and challenging the existing assumptions and biases of the health care system. Prerequisite: junior or senior standing or instructor's consent.

**HLTH\_SCI 4410. Humanism and Health Literacy. 3 Credits.**

This class will teach how the humanities can help students become better health professionals. Topics include: spirituality and health; non-medical factors that impact health; representation of disability in art history; and literature and health. Graded on A/F basis only.

**HLTH\_SCI 4420. Health Literacy and Behavioral Compliance. 3 Credits.**

Students will learn about the behavioral, psychological, and cognitive factors that impact health literacy and the ability to follow healthcare recommendations.

**HLTH\_SCI 4480. Clinical Ethics. 3 Credits.**

(same as Cardiopulmonary and Diagnostic Science [CPD] 4480) Exploration of important global bioethics issues in health care systems with emphasis placed on issues related to patient choice and provider responsibility. Topics include philosophical theories, principles and models for ethical and lawful decision making in healthcare. Restricted to Health Science Majors.

**HLTH\_SCI 4500. Health Care Management. 3 Credits.**

Examines various management concepts as they relate to the unique environment of health care. Concepts include planning, decision making, budgeting, staffing, organizing, and motivating for working with individuals or teams. Prerequisites: Health Professions [HTH\_PR] 2100; junior standing. Graded on A/F only.



**HLTH\_SCI 4975. Internship in Health Sciences. 1-6 Credit.**

Focuses on knowledge, skills and attitudes that enhance personal effectiveness and professional success. Opportunities to research selected career paths and related topics in health sciences and participate in directed service learning projects or internships in selected emphasis area. Prerequisite: Health Professions [HTH\_PR] 2100. Graded on A/F basis only.

**HLTH\_SCI 4985. Healthcare Organization and Leadership. 3 Credits.**

(same as Cardiopulmonary and Diagnostic Science [CPD] 4985) In this course, students will explore leadership principles as they relate to the student's focus area, combining previous expertise in the field with an interdisciplinary perspective within the healthcare community. Prerequisites: Health Professions [HTH\_PR] 2100. Senior standing required. Graded A-F only.

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## Hebrew (HEBREW)

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**HEBREW 1100. Elementary Hebrew I. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly.

**HEBREW 1200. Elementary Hebrew II. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly. Prerequisite: C- or better in Hebrew [HEBREW] 1100, or equivalent.

**HEBREW 2001. Topics in Hebrew-General. 1-3 Credit.**

Organized study of selected topics. Subjects and topics may vary semester to semester. May be repeated with consent of department.

**HEBREW 2005. Topics in Hebrew - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and topics may vary semester to semester. May be repeated with consent of department. No knowledge of Hebrew required. No language credit.

**HEBREW 3085. Problems in Hebrew. 1-3 Credit.**

Supervised study of Hebrew language and/or culture. Prerequisite: instructor's consent.

**HEBREW 3310. Introduction to Israeli Culture. 3 Credits.**

Examines unique qualities that shape modern Israeli culture; looks at major social and political events that have shaped ethnicity, ideology, religion, identity, and diversity of the State of Israel. Discusses literature, the fine arts, language, and the mass media. No Foreign Language credit. Prerequisite: sophomore standing or instructor's consent. Graded on A/F basis only.

**HEBREW 3845. Modern Israeli Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3845). Examines the modern film of developing Israel. Discusses complex social relationships. Introduces concepts of Hebrew language and its use in the arts world-wide. Discusses varied communities in Israel, and universal themes such as democracy and social justice. Provides introduction to Israeli culture. Prerequisite: sophomore standing or consent of instructor required. Graded on A/F basis only.

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## History (HIST)

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**HIST 1004. Undergraduate Topics in History-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. Prerequisite: departmental consent for repetition.

**HIST 1100. Survey of American History to 1865. 3 Credits.**

Introduction to U.S. history through the Civil War, surveying political, economic, social and cultural development of the American people.

**HIST 1100H. Survey of American History to 1865 - Honors. 3 Credits.**

Introduction to U.S. history through the Civil War, surveying political, economic, social and cultural development of the American people. Honors eligibility required.

**HIST 1200. Survey of American History Since 1865. 3 Credits.**

Introduction to U.S. history since 1865, surveying political, economic, social, and cultural development of the American people.

**HIST 1200H. Survey of American History Since 1865 - Honors. 3 Credits.**

Introduction to U.S. history since 1865, surveying political, economic, social, and cultural development of the American people. Honors eligibility required.

**HIST 1400. American History. 5 Credits.**

Broad survey of political, economic, social, intellectual, diplomatic and constitutional development of American people from first English settlements to present day; emphasizes evolution of American culture and institutions. Students may not receive additional credit for History [HIST] 1100 and/or 1200.

**HIST 1410. African American History. 3 Credits.**

(same as Black Studies [BL\_STU] 1410). Survey of social, political and economic development to the African American people in American life from 1619 to the present.

**HIST 1420. Globalization and History. 3 Credits.**

This course will explore the contemporary phenomenon of globalization in historical perspective. Our goal will be to help students come to terms with the origins and dynamics of this process, which is transforming our economy and society more rapidly and thoroughly than ever before.

**HIST 1500. Foundations of Western Civilization. 3 Credits.**

Development of characteristic ideas and institutions of Western cultural tradition, from origin of civilization in ancient Near East to beginning of rapid social, political, intellectual transformation of Europe in 18th century.

**HIST 1500H. Foundations of Western Civilization - Honors. 3 Credits.**

Development of characteristic ideas and institutions of Western cultural tradition, from origin of civilization in ancient Near East to beginning of rapid social, political, intellectual transformation of Europe in 18th century. Honors eligibility required.

**HIST 1510. History of Modern Europe. 3 Credits.**

Selected major themes in European history from French Revolution to recent times. Breakdown of traditional institutions, ideas; political, social revolution; industrialization, nationalism, imperialism, world wars; democratic, totalitarian ideologies, movements; quest for international order, European unity.

**HIST 1510H. History of Modern Europe - Honors. 3 Credits.**

Selected major themes in European history from French Revolution to recent times. Breakdown of traditional institutions, ideas; political, social revolution; industrialization, nationalism, imperialism, world wars; democratic, totalitarian ideologies, movements; quest for international order, European unity. Honors eligibility required.

**HIST 1520. The Ancient World. 3 Credits.**

Survey of institutional and cultural development of ancient Near East, Greece, Rome, and Asia.

**HIST 1540. England Before the Glorious Revolution. 3 Credits.**

Survey of English institutions, culture and politics from the Roman invasion to the Revolution of 1688.

**HIST 1550. Britain 1688 to the Present. 3 Credits.**

Surveys British history from 1688 to present. Emphasizes social and economic change.

**HIST 1560. The World of the Middle Ages. 3 Credits.**

Survey of European development from the fall of Rome to the 16th century.

**HIST 1570. Survey of Early Modern Europe, 1350-1650. 3 Credits.**

Survey of Western and Central Europe (including Britain) from the Black Death to the end of the Thirty Years' War. This period comprises late medieval crises, the Renaissance, Reformation, Counter-Reformation, Exploration and the New World, the Confessional Age, early modern state-building, and the Thirty Years' War.

**HIST 1580. History of Christianity. 3 Credits.**

Origin, diffusion and development of Christianity, with special attention to its influence on Western civilization. Major emphasis on period up to French Revolution.

**HIST 1590. Women and the Family in the Pre-Modern West. 3 Credits.**

Examines the changing roles of women and familial structures from the Ancient Mediterranean World to the Protestant Reformation and the effects of religious, political and economic change on the family.

**HIST 1600. Foundations of Russian History. 3 Credits.**

A survey of the Kievan and Muscovite period to the end of the 17th century.

**HIST 1610. Russia in Modern Times. 3 Credits.**

(same as Peace Studies [PEA\_ST] 1610). Survey of Russian history from 1801 to present.

**HIST 1790. History of Early Africa. 3 Credits.**

(same as BL\_STU 1790). This course introduces students to the early history of Africa. It focuses on political, social, economic and cultural developments based on primary and secondary sources available in print and online.

**HIST 1800. The Making Modern Africa. 3 Credits.**

(same as Black Studies [BL\_STU] 1800). This course introduces students to the recent history of Africa. It provides them with an opportunity to understand the main challenges Africans faced since colonial times based on primary and secondary sources.

**HIST 1810. History of South Africa. 3 Credits.**

(same as Black Studies [BL\_STU] 1810). Surveys the social, cultural and economic dynamics of South African society from the 16th century to the present with an emphasis on the last two centuries and the consolidation of the apartheid state.

**HIST 1820. Asian Humanities. 3 Credits.**

(same as Religious Studies [REL\_ST] 1820, Art History and Archeology [AR\_H\_A] 1230 and South Asian Studies [S\_A\_ST] 1152). This course in an introduction to the literature and visual arts of Asia through selected master works. It focuses principally on India and China and investigates the distinctive features of their cultures.

**HIST 1830. Survey of East Asian History. 3 Credits.**

Introductory survey of the history of East Asian countries (China, Korea, Vietnam, and Japan) in the past two thousand years, focusing on their

cultural, economic, and political traditions as well as their transformations in the modern era.

**HIST 1840. Colonial Latin America. 3 Credits.**

Survey of Latin America, 1492-1825; Exploration and conquest; European settlement; colonial government and institutions; economy and society; cultural and intellectual life, independence movements.

**HIST 1850. Latin America Since Independence. 3 Credits.**

Political, social and economic developments; nationalism; revolutionary movements; U.S. influence.

**HIST 1860. History of Ancient India. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 1860). This course surveys the history of South Asian history. The course begins with the Indus Valley Civilization (fl. 2600-1900B.C.) and ends with an analysis of Islamic impact on India culture around 1200-1350. Emphasis will be placed on cultural and social history, religion, arts and literature, and the sources used for the study of premodern civilizations. Students will develop a basic knowledge and vocabulary necessary to pursue additional South Asian courses.

**HIST 1861. History of Modern India. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 1861). This course surveys the history of the South Asian subcontinent from the early seventeenth through the twentieth century. Emphasis will be placed on cultural and social history, religion, arts and literature, imperialism and colonialism, and the sources used for the study of modern civilizations. Students will develop a basic knowledge and vocabulary necessary to pursue additional South Asian courses.

**HIST 1862. History of India: 1000-1750. 3 Credits.**

(Same as South Asia Studies [S\_A\_ST] 1862) This course surveys the history of the South Asian subcontinent from the eleventh through mid-eighteenth centuries. Emphasis will be placed on cultural and social history, religion, arts and literature, and the sources used to study civilization. Students will develop a basic knowledge and vocabulary necessary to pursue additional South Asian courses.

**HIST 1870. Imperial China: China to 1600. 3 Credits.**

This course offers a broad introduction to Chinese history and culture from antiquity up to the later imperial period (around 1600). It is designed to provide the student with an understanding of the historical development of China's culture, economic, political, and intellectual traditions.

**HIST 1871. History of China in Modern Times. 3 Credits.**

This is a lecture course designed to introduce to beginning level students the epic journey of China's historical transformation since c. 1600. This survey provides a basis for understanding the painstaking transition from "tradition" to "modernity" in China.

**HIST 1872. Mao's China and Beyond: China Since 1949. 3 Credits.**

Through a series of readings, images, and film we will look at the dramatic cultural, economic, social and intellectual changes the People's Republic of China has experienced since 1949, and look at the interrelated, yet often contradictory, challenges facing Beijing in regards to the task of furthering economic prosperity while promoting policies of integrating with the international society.

**HIST 2004. Topics in History-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition.

**HIST 2210. Twentieth Century America. 3 Credits.**

Survey of American development from 1900 to present. For students who have not taken advanced courses in American history, especially History [HIST] 4210, 4220, or 4230.

**HIST 2220. America in the 1960's. 3 Credits.**

(same as Peace Studies [PEA\_ST] 2220). Examines the political and cultural main currents of the 1960s. Emphasizes the challenges mounted by protest groups and the responses of America's political leadership to the ferment of the period. Prerequisite: sophomore standing.

**HIST 2230. Walt Disney and American Culture. 3 Credits.**

Examines Walt Disney's influence on shaping of modern American culture.

**HIST 2400. Social History of U.S. Women. 3 Credits.**

(same as Women's and Gender Studies [WGST] 2400). This course, the social History of US Women, offers a general overview of US Women, beginning with the colonial period up to the present day.

**HIST 2410. African American Women in History. 3 Credits.**

(same as Black Studies [BL\_STU] and Women's and Gender Studies [WGST]2410). African American Women in history is a topics course covering major issues affecting black women since their introduction into english-speaking North America to the present.

**HIST 2420. Conspiracy Theories & Conspiracies in American History & Culture. 3 Credits.**

From the Salem witch trials to the present-day obsessions with the JFK assassination, UFOs, and the like, Americans have often embraced conspiracy theories to explain mysterious events and wrenching social changes. The primary objective of the course is to help students deal more intelligently with the conspiratorial fears and political paranoia that pervade modern American culture, by placing them in a broad historical context. Prerequisite: sophomore standing or instructor's consent.

**HIST 2430. History of American Religion. 3 Credits.**

This course focuses on the overall development of American religion from the 17th century to the present. Students will be invited to think about the larger questions concerning American religion, including why religion in America has developed in the way that it has, and how and why it continues to thrive in American popular culture.

**HIST 2440. History of Missouri. 3 Credits.**

Survey of Missouri's development from the beginning of settlement to present.

**HIST 2520. Europe in the Nineteenth Century. 3 Credits.**

Political, social, economic, and cultural development of Europe from French Revolution to outbreak of World War I. Prerequisite: sophomore standing required.

**HIST 2530. Ukrainian History from Medieval to Modern Times. 3 Credits.**

A successor state of the former Soviet Union, Ukraine occupies a strategic position in Eastern Europe. The course will trace the long, turbulent history of this East Slavic nation, culminating the independence in 1991.

**HIST 2531. Women in Russian History. 3 Credits.**

This is a survey course which is designed for students who have not previously taken in course in Russian history, and who are interested in how women experienced the period from the formation of the Kievan state in the ninth century to the fall of the Soviet Union in 1991.

**HIST 2600. Early Christianity. 3 Credits.**

(same as Religious Studies [REL\_ST] 2600). History of Christian practices and teachings from Christian origins through the 8th century, including Eastern Orthodoxy Syrian Christianity, Roman Catholicism. Themes such as interpretation and creation of Scriptures, worship style, central rituals, debates about right teaching (orthodoxy) mysticism and developing lifestyles both in and apart from the world. Prerequisite: sophomore standing.

**HIST 2610. Medieval Christianity. 3 Credits.**

(same as Religious Studies [REL\_ST] 2610). Study of the doctrinal developments, major theologians and schools, institutional formation and dissolution, mysticism, and liturgical expression within the context of cultural and political history. Beginning with Augustine and concluding with the 15th century. Prerequisite: Religious Studies [REL\_ST] 2600.

**HIST 2620. History of Christianity, 1500-Present. 3 Credits.**

(same as Religious Studies [REL\_ST] 2620). Protestant and Catholic Christianity in age of European expansion; enlightenment; 19th and 20th-century challenges and responses. Prerequisites: Religious Studies [REL\_ST] 2600 and 2610.

**HIST 2630. History of Christian Traditions. 3 Credits.**

(same as REL\_ST 2630). An overview of the origins and development of Christianities from the first century of the Common Era to the present day. Topics will include competing Christian theologies, colonialism, conversion narratives, globalization, religious violence, and heresy.

**HIST 2800. Women in Indian History. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 2800). This course examines the role of women in Indian (South Asian) history, focusing on women in British India from the eighteenth century up to the Partition of 1947. While previous knowledge of South Asian history may be beneficial, it is not required for this course.

**HIST 2950. Sophomore Seminar. 3 Credits.**

This course is designed to introduce history majors to the experience of doing original research early in their undergraduate career. Topic will vary. Prerequisites: sophomore standing required; departmental consent required.

**HIST 3000. History of Religion in America to the Civil War. 3 Credits.**

(same as Religious Studies [REL\_ST] 3000). Studies major American religious traditions from the Age of Discovery to the Civil War, especially the evolution of religious practices and institutions and their influence upon American social, intellectual and political developments. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3010. Colonial America. 3 Credits.**

This course will examine major colonial American events from a cultural history standpoint. We will explore the ways in which the famous and not so famous shaped and were shaped by events of the seventeenth and eighteenth centuries and how these people understood the changing meaning of American liberty.

**HIST 3200. Black Freedom Movement, 1955-1973. 3 Credits.**

(same as Black Studies [BL\_STU] 3200). Examines the dismantling of American apartheid and its transformation into a new racial control system. It also explores how and why the Civil Rights Movement was converted into a struggle for Black Power. May be restricted to History majors only during pre-registration.

**HIST 3210. History of Religion in Post-Civil War America. 3 Credits.** (same as Religious Studies [REL\_ST] 3210). Surveys major American religious traditions from 1865 to the present. Focuses on the evaluation of religious practices and institutions and their interaction with and influence upon American social, intellectual and political developments. May be restricted to History majors only during pre-registration.

**HIST 3220. U.S. Women's Political History, 1880-Present. 3 Credits.** (same as Women's and Gender Studies [WGST] 3220). This course explores American women's engagement with American politics (broadly defined) over the course of the twentieth century. It addresses issues of political identity, organization, ideology, and division. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3230. Individualism and Success in Modern America, 1830-Present. 3 Credits.** This course explores changing notions of individualism and success in American culture during the 19th and 20th centuries. Standards defining achievement, gain, and happiness for the individual citizen have evolved over time, and we will examine a wide variety of sources - advice literature, essays, novels, historical texts, plays and movies, political and religious texts, social criticism - to analyze this broad evolution. The resulting insights into a variety of historical issues and values, problems and possibilities, promise to forge a deeper understanding of what it has meant to be a successful individual in the United States over the last two hundred years. May be restricted to History majors only during pre-registration.

**HIST 3400. Religious Biography: Black Religion. 3 Credits.** (same as Black Studies [BL\_STU] 3590). Studies black American religion through the biographies of representative and influential figures of the 19th and 20th centuries, including Nat Turner, W.E.B. Du Bois, and Marcus Garvey, M.L. King, Malcolm X. May be restricted to History majors only during pre-registration.

**HIST 3420. America's Environmental Experience. 3 Credits.** (same as Peace Studies [PEA\_ST] 3420). Team-taught analysis of American thought and action on physical environment during 19th-20th centuries. Relation between politics, economics, technological change, environmental quality; roles of science, law, regulatory agencies, grassroots action. May be restricted to History majors only during pre-registration.

**HIST 3430. Sex Radicals in U. S History. 3 Credits.** (same as Women and Gender Studies [WGST] 3430). Survey of the history of sexuality in the United States. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3510. The Ancient Greek World. 3 Credits.** Political and social institutions, intellectual life of Greek city-states to time of Alexander. May be restricted to History majors only during pre-registration.

**HIST 3520. The Roman World. 3 Credits.** Rise and development of Roman institutions, Rome's imperialism and culture through reign of Marcus Aurelius. May be restricted to History majors only during pre-registration.

**HIST 3530. Alexander the Great and the Hellenistic World. 3 Credits.** Alexander's conquest of the East to 323 B.C.; political, social, economic development of Hellenistic kingdoms from his death to 31 B.C. May be restricted to History majors only during pre-registration.

**HIST 3540. 20th Century Europe. 3 Credits.** Political, social, and economic development of Europe from 1900 to the present, with emphasis on the period between the two world wars. May be restricted to History majors only during pre-registration.

**HIST 3550. The Origins of Scientific Thought. 3 Credits.** This course will trace the evolution of Western science from its Egyptian-Babylonian roots to the "Copernican Revolution" of the mid-sixteenth century. Prerequisites: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3560. The Scientific Revolution: 1550-1800. 3 Credits.** This course covers the history of science, or natural philosophy, from late Renaissance to the beginnings of the "Darwinian Revolution." Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3570. European Women in the 19th Century. 3 Credits.** (same as Women's and Gender Studies [WGST] 3570). Examines the history of European women from 1750 to 1900. The course focuses on how industrialization, the French Revolution and nation-formation changed women's roles in the family, workplace and the state. Grading: exams, papers and discussions. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3580. Modern Italy, 1815 to the Present. 3 Credits.** Political, cultural and social history of Italy since 1815. Looks at how Unification, World War, Fascism, the Cold War, Student protests, the women's movement and the end of the USSR shaped contemporary Italy. May be restricted to History majors only during pre-registration.

**HIST 3590. The Early Middle Ages. 3 Credits.** This course will focus on the social, political, economic, and cultural development of Europe from roughly 300 to 1050. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3600. The Later Middle Ages. 3 Credits.** This course will focus on the social, political, economic, and cultural development of Europe from roughly 1050 to 1500. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3610. Ireland, 1100s to 1850. 3 Credits.** (same as Peace Studies [PEA\_ST] 3610). Ireland, from Conquest to Famine: Ireland's history as the first British Colony, from the conquests of the 1100s and 1500s-1600s to the Irish rebellion of 1798 and the Great Famine and mass emigration of 1845-50. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3611. Ireland, 1850-1923. 3 Credits.** (same as Peace Studies [PEA\_ST] 3611). Ireland, from Famine to Partition: Irish history from the Great Famine of 1845-50 to the revolutions of 1916-23 that brought partial independence from Britain but partitioned Ireland into two hostile and trouble states. May be restricted to History majors only during pre-registration.

**HIST 3612. Ireland, 1920-Present. 3 Credits.** (same as Peace Studies [PEA\_ST] 3612). Ireland, from Partition to the Present: After surveying the conflicts that led to Irish revolution and partition in 1916-23, the course focuses on the development of post partition Ireland and Northern Ireland, and on the violence that has scarred Northern Ireland since the 1960s. Prerequisites: History [HIST] 3610 and/or 3611 recommended. May be restricted to History majors only during pre-registration.

**HIST 3624. Comparative Approaches to Black Studies in History. 3 Credits.**

(same as BL\_STU 3624). Comparative approach to the study of Black Diaspora history that focuses on the theory, method, structure, and application of modes of cultural production within the history of Black Diaspora cultures. Program consent for repetition.

**HIST 3810. Imperial China. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3810). A survey of China under the Manchu Ch'ing dynasty. Within framework of the dynastic cycle, examines imperial rule, Chinese society, culture, art, internal rebellion, Western intrusion and modernization. May be restricted to History majors only during pre-registration.

**HIST 3820. Twentieth Century China. 3 Credits.**

History of China from Nationalist Revolution of 1911 to present. A problem-oriented course: special emphasis on Mao and Maoist ideology, social, literary and cultural history also receive attention. Prerequisites: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 3830. Chinese Women's History. 3 Credits.**

Historical analysis of Chinese women in family, community, ideology, and national politics from the Late Imperial period to the present. Prerequisites: sophomore standing or instructor's consent. May be restricted to History majors only during pre-registration.

**HIST 3850. Islam and the West. 3 Credits.**

This course provides a historical intellectual context for the raging debate on Islam and the West. It will discuss how Muslims conceived and reacted variously to the political and cultural challenge the West posed in the nineteenth and twentieth century. It will focus on the discourse on the reception of modernization in Islam. It will highlight the political and cultural energies invested by various Muslim elite communities to distinguish between modernization and Westernization. Islamic fundamentalism, the dominant Islamic expression of our time, will be usefully discussed in the context of this debate and praxis about modernization, authenticity, and Westernization. Prerequisite: junior/senior standing. May be restricted to History majors only during pre-registration.

**HIST 3860. History of Mexico. 3 Credits.**

Survey of Mexican history from Cortes to present day. May be restricted to History majors only during pre-registration.

**HIST 3870. Social Revolution in Latin America. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3870 and Sociology [SOCIO] 3870). Twentieth century social revolutions in selected Latin American countries. May be restricted to History majors only during pre-registration.

**HIST 3880. History of Caribbean America. 3 Credits.**

Comparative regional study of insular and mainland Caribbean nations. Emphasis on modern period. Independence; abolition of slavery; U.S. hegemony; economic, social, and political upheaval. May be restricted to History majors only during pre-registration.

**HIST 4000. Age of Jefferson. 3 Credits.**

Political, constitutional, cultural, and economic developments in United States during formative period of Republic, 1787-1828. Special attention to Constitutional Convention, formation of national political institutions. May be restricted to History majors only during pre-registration.

**HIST 4001. Topics in History-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition.

**HIST 4004. Topics in History-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition. May be restricted to History majors only during pre-registration.

**HIST 4010. The Age of Jackson. 3 Credits.**

This course will examine American Politics, society and culture in the 1820's, 1830's, and 1840's. Considerable attention will be devoted to Andrew Jackson himself, as a figure who both shaped and represented his era, for better or worse. May be restricted to History majors only during pre-registration.

**HIST 4030. History of the Old South. 3 Credits.**

Study of the South to 1860. May be restricted to History majors only during pre-registration.

**HIST 4040. Houses Divided: Society and Politics in the Civil War Era. 3 Credits.**

(Same as Black Studies [BL\_STU] 4040) Houses Divided: Society and Politics in the Civil War Era examines the sectional crisis, the Civil War and Reconstruction through the lens of divided households. Considers the experience of soldiers and civilians, women and men, slaves and freed people. May be restricted to History majors only during pre-registration.

**HIST 4050. American Colonial History to 1760. 3 Credits.**

Study of colonial America; special emphasis on creation of a native American culture prior to 1760. May be restricted to History majors only during pre-registration.

**HIST 4055. Witchcraft in Seventeenth Century New England. 3 Credits.**

This course explores the social, cultural and intellectual aspects of witchcraft and witch-hunting in seventeenth century New England.

**HIST 4060. The Period of the American Revolution, 1760-1789. 3 Credits.**

Analysis of the Revolution, its causes and consequences, through establishment of the new government in 1789. May be restricted to History majors only during pre-registration.

**HIST 4070. Indians and Europeans in Early America. 3 Credits.**

A study of the cultural, political and often military struggle that took place for control of North America from contact through mid 19th century emphasizing native efforts to resist European domination and expansion in areas that became the U.S. and Canada. Prerequisite: History [HIST] 1100 or equivalent. May be restricted to History majors only during pre-registration.

**HIST 4080. American Foreign Policy from Colonial Times to 1898. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4080). May be restricted to History majors only during pre-registration.

**HIST 4085. Special Problems in History. 1-99 Credit.**

Independent investigation leading to a paper or project.

**HIST 4100. American Cultural and Intellectual History to 1865. 3 Credits.**

Origins and growth of American values and ideas considered in their social context. Topics include: the work ethic, republican politics,

revivalism, reform movements, sexual attitudes, literature in the marketplace, Afro-American and slave-holding subcultures. May be restricted to History majors only during pre-registration.

**HIST 4200. American Cultural and Intellectual History Since 1865. 3 Credits.**

Tensions and transformations in American culture to the present. Topics include: spiritual crisis in Christianity; rise of welfare state liberalism; socialist and feminist alternatives; literature and the arts. May be restricted to History majors only during pre-registration.

**HIST 4210. Origins of Modern America, 1877-1919. 3 Credits.**

Political, social, economic, and intellectual evolution of America into a modern society, 1877-1918. May be restricted to History majors only during pre-registration.

**HIST 4220. U.S. Society Between the Wars 1918-1945. 3 Credits.**

Detailed examination of American history from end of World War I to end of World War II. May be restricted to History majors only during pre-registration.

**HIST 4230. Our Times: United States Since 1945. 3 Credits.**

Detailed examination of American history from end of World War II to the present. May be restricted to History majors only during pre-registration.

**HIST 4240. History of the New South. 3 Credits.**

Study of the South since 1860. May be restricted to History majors only during pre-registration.

**HIST 4250. U.S. Foreign Relations, 1898-1945. 3 Credits.**

A history of American Foreign Policy from the Spanish American War to the end of World War II. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 4260. The Age of Ascendancy: U.S. Foreign Relations, 1945 - Present. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4260). Surveys the Cold War in Europe and Asia, the Korean and Vietnam Wars, and Middle East policy. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 4270. African-Americans in the Twentieth Century. 3 Credits.**

(same as Black Studies [BL\_STU] 4270). Surveys the African-American experience from 1900 to the present. Attention is given to economic, political, social, and cultural trends. May be restricted to History majors only during pre-registration.

**HIST 4280. America in the Reagan Years. 3 Credits.**

Examines the major political, economic, social, and cultural currents and developments of the "Long Eighties," from Jimmy Carter's "malaise speech" of July 1979 to Bill Clinton's mid-1990s embrace of welfare reform and pronouncement that the era of big government was over. May be restricted to History majors only during pre-registration.

**HIST 4310. Adoption, Child Welfare and the Family, 1850-Present. 3 Credits.**

(same as Women and Gender Studies [WGST] 4310). This interdisciplinary U.S. history course will address topics such as: changing legal and social meaning of adoption since 1850; historical connections between adoption and poverty, family, gender race, sexuality, class, fertility, identity; and more recent issues such as transnational adoption. May be restricted to History majors only during pre-registration.

**HIST 4400. History of American Law. 3 Credits.**

American law from English origins to present. Reviews common law, codification, legal reform movements, slavery law, administrative state,

formalism, legal realism, jurisprudential questions concerning rule of law. Prerequisites: History [HIST] 1100, 1200, or 1400. May be restricted to History majors only during pre-registration.

**HIST 4410. Introduction to U.S. Social History. 3 Credits.**

Study of daily life and the ways ordinary Americans experienced historical change. Considers such topics as work, leisure, family and community. Compares how people's experiences varied by region, class, gender, ethnicity, and race. May be restricted to History majors only during pre-registration.

**HIST 4415. African Americans and American Justice. 3 Credits.**

(same as Black Studies [BL\_STU] 4415) This course provides opportunities to review and discuss selected court cases and legislation in which black men, women, or children were plaintiffs and defendants or affected by the laws. May be restricted to History majors only during pre-registration.

**HIST 4420. American Urban History. 3 Credits.**

Growth, development and implications of the city in American history; historical analysis of urban problems. May be restricted to History majors only during pre-registration.

**HIST 4430. The Great West in American History. 3 Credits.**

Historical development of major regions, with emphasis on response to environment, public land policy, role of government in economic and resource development, citizen action, and cultural pluralism. May be restricted to History majors only during pre-registration.

**HIST 4440. History of the American Environment. 3 Credits.**

A reading and discussion course exploring diverse responses to the changing American environment from early man to the present, including ecological, institutional, and philosophical aspects. May be restricted to History majors only during pre-registration.

**HIST 4470. Quantitative Methods in Historical Study. 3 Credits.**

Introduces quantitative approaches to the study of history. Emphasizes opportunities, limitations, and dangers involved in several common forms of quantitative study. Math Reasoning Proficiency Course. May be restricted to History majors only during pre-registration.

**HIST 4480. War Crimes and Genocide. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4480). This course will explore the development of international law, international consciousness, and U.S. Foreign policy on the two distinct but often related issues of war crimes and genocide during the late 19th and throughout the 20th centuries. May be restricted to History majors only during pre-registration.

**HIST 4500. Philip II and Alexander the Great of Macedonia. 3 Credits.**

Concentrates on the history and politics of Greece during reigns of these two kings along with Alexander's military conquests and various controversies from the period. Prerequisite: junior standing or instructor's consent. May be restricted to History majors only during pre-registration.

**HIST 4510. Crime and Punishment: Law in Classical Athens. 3 Credits.**

Examines the main principles of Athenian law and judicial procedures including history of law code and study of actual speeches from a variety of law suits and procedures. May be restricted to History majors only during pre-registration.

**HIST 4515. Power and Oratory in Ancient Greece. 3 Credits.**

Concentrates on the rise of oratory in Greece and how oratory was exploited for political ends. Special attention will be paid to the Athenian Democracy in the fifth and fourth centuries BC. May be restricted to History majors only during pre-registration.

**HIST 4530. The Roman Empire. 3 Credits.**

Roman imperialism; management of, and rebellion in, the Empire; cultural exchange between Rome and its provinces. May be restricted to History majors only during pre-registration.

**HIST 4540. The Later Roman Empire. 3 Credits.**

Political, religious and cultural life in Late Antiquity, from the "soldier emperors," to the barbarian kingdoms and early Byzantium. May be restricted to History majors only during pre-registration.

**HIST 4550. Age of the Vikings. 3 Credits.**

Scandinavia and Scandinavian expansion in the Central Middle Ages. Covers political, economic, religious, and cultural effects of the Viking movement. Prerequisites: History [HIST] 1500, 1540, 1600 or 2560 recommended; junior standing required or instructor's consent. May be restricted to History majors only during pre-registration.

**HIST 4555. Medieval France. 3 Credits.**

This course covers the area that became the kingdom of France from the end of the Roman era until the end of the Hundred Years War; emphasis on political and cultural developments. Junior Standing or consent of instructor required. Previous coursework in medieval history recommended.

**HIST 4560. The Crusades. 3 Credits.**

Survey of the European crusading movement from its inception in the late eleventh century to its decline during the later Middle Ages. Prerequisites: junior standing or instructor's consent. May be restricted to History majors only during pre-registration.

**HIST 4570. Intellectual History of Europe, 17th and 18th Centuries. 3 Credits.**

The Enlightenment's attack on traditional Christian thought and values. Prerequisite: junior standing or departmental consent. May be restricted to History majors only during pre-registration.

**HIST 4580. Intellectual History of Europe, 19th and 20th Centuries. 3 Credits.**

Topics include: Romanticism, Darwin, Marx and Freud. Prerequisite: junior standing or departmental consent. May be restricted to History majors only during pre-registration.

**HIST 4610. Early Modern Britain, 1450-1688. 3 Credits.**

Study of English politics, society, economy, culture, and religion during primarily the Tudor and Stuart eras, from the establishment of the Tudor dynasty (1485) through the Glorious Revolution. Emphasis on social and religious history. Prerequisite: sophomore standing. May be restricted to History majors only during pre-registration.

**HIST 4620. Modern England. 3 Credits.**

Surveys British history in the 18th and 19th centuries. Emphasizes social and economic change. May be restricted to History majors only during pre-registration.

**HIST 4625. The Idea of Social Evolution in the Age of Darwin. 3 Credits.**

The purpose of this course is to explore the impact of the Darwin revolution in the life sciences on ideas about social evolution, from the Victorian Era to the present.

**HIST 4630. The Age of the Renaissance. 3 Credits.**

Major changes in European economic, social, political, religious, and intellectual life between 1250-1500. Humanism and Renaissance. The "Renaissance problem." May be restricted to History majors only during pre-registration.

**HIST 4640. The Age of the Reformation. 3 Credits.**

State of Europe about 1500. Political, diplomatic, social, and intellectual changes to 1648. Humanistic reform movements. Protestant-Catholic Reformation. Development of the modern state and international relations. May be restricted to History majors only during pre-registration.

**HIST 4650. Revolutionary France, 1789-1815. 3 Credits.**

Revolutionary upheavals of the revolutionary-Napoleonic era, which destroyed traditional French society and laid the basis for modern France. Prerequisite: junior standing or departmental consent. May be restricted to History majors only during pre-registration.

**HIST 4660. European Women in the 20th Century. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4660). Examines the history of European women from World War I to the present. The course focuses on wars, migration, and the changing nature of family, work and community. Prerequisite: junior standing. May be restricted to History majors only during pre-registration.

**HIST 4670. Germany in the Nineteenth Century. 3 Credits.**

Cultural, social and political history of Central Europe from 1800 to 1914. A case study in incomplete modernization, focused on industrialization, unification, cultural crisis and imperialism. May be restricted to History majors only during pre-registration.

**HIST 4680. Germany in the Twentieth Century. 3 Credits.**

Cultural, social and political history from 1914 to present day. Focus on world wars, national socialism, the holocaust, the cold war and the emergence of East and West Germany. May be restricted to History majors only during pre-registration.

**HIST 4700. Imperial Russia, 1682-1825. 3 Credits.**

Russia in the 18th and early 19th centuries, with special emphasis on the reigns of Peter I, Catherine II, and Alexander I. May be restricted to History majors only during pre-registration.

**HIST 4710. The Russian Revolution. 3 Credits.**

Analyzes the transformation of Russian society that produced the collapse of autocracy, efforts to create a parliamentary government, the Bolshevik seizure of power in 1917, and the civil war that followed. May be restricted to History majors only during pre-registration.

**HIST 4800. Modern Japan and China--A Comparative Survey. 3 Credits.**

A structured, comparative examination of the histories and cultures of Japan and China, from the mid-19th century to the present. Orientation towards broad social, intellectual and political developments. May be restricted to History majors only during pre-registration.

**HIST 4840. History of the Mongols. 3 Credits.**

In the 13th century, the Mongols went from warring tribes to the largest Eurasian empire in history. This course examines the Mongol tribes, Chinggis Khan's unification of the tribes, the Mongols rapid military victories across Eurasian and their equally rapid decline. May be restricted to History majors only during pre-registration.

**HIST 4850. Traversing the Muslim World. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 4850). The traveler's tale formed an important part of the medieval world's system of knowledge. This writing intensive seminar-style course examines a wide array of the most influential travelers in Muslim lands such as Ibn Fadlan, Ibn Battuta, Benjamin of Tudela and Marco Polo. Prerequisites: restricted to juniors and seniors only. May be restricted to History majors only during pre-registration.

**HIST 4860. Indian Army as Colonial Army. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 4860). This writing intensive seminar-style course examines how the Indian Army acted as a colonial army in the British Empire, including Africa, the Boxer Rebellion, and the World Wars. Focus is on the role of the Indian Army, impact of the Sepoy Mutiny, and martial race ideology. Prerequisites: restricted to juniors and seniors only. May be restricted to History majors only during pre-registration.

**HIST 4870. Southeast Asia Since the Eighteenth Century. 3 Credits.**

The general objective of this course is to introduce students to the fascinating world of Southeast Asia. We will look at the shared history of commodity, cultural, and religious exchanges that gave this region a collective character, as well as explore the historical conditions from which individual modern Southeast Asian state emerged. May be restricted to History majors only during pre-registration.

**HIST 4880. Chinese Migration Modern Times. 3 Credits.**

This course surveys Chinese emigration in the global context over the span of five centuries. We will pay special attention to the changing relationships between China and Chinese migrants. Our emphasis will be on history as a process of negotiation and contestation of heterogeneous groups or individuals through creative and selective activities. May be restricted to History majors only during pre-registration.

**HIST 4940. Internship in History. 3 Credits.**

Professional training in history and archive-related fields. Prerequisites: History Department Area of Concentration; junior or senior standing; departmental consent. Graded on S/U basis only.

**HIST 4960. Special Readings in History. 1-99 Credit.**

Individual work, with conferences adjusted to needs of student.

**HIST 4970. Undergraduate Seminar in Third World History. 3 Credits.**

Readings in selected problems in the history of Africa, Asia or Latin America with reports and discussion. Prerequisite: junior standing, departmental consent.

**HIST 4971. Undergraduate Seminar in European History. 3 Credits.**

Readings in problems in European history with reports and discussion. Prerequisite: junior standing, departmental consent.

**HIST 4972. Undergraduate Seminar in American History. 3 Credits.**

Readings in selected problems in American history with reports and discussion on selected topics. Prerequisite: junior standing, departmental consent.

**HIST 4980. Undergraduate Thesis in History. 3 Credits.**

Individually directed research leading to a senior thesis. Prerequisite: senior standing and departmental consent.

**HIST 4981. Undergraduate Thesis in History. 3 Credits.**

Continuation of History [HIST] 4980. Prerequisite: senior standing and departmental consent.

**HIST 4995. Honors Thesis in History. 3 Credits.**

Research and completion of the thesis required for graduation with Honors in History. Prerequisite: departmental consent.

**HIST 4996. Honors Thesis in History. 3 Credits.**

Continuation of History [HIST] 4995. Prerequisite: departmental consent.

**HIST 7000. Age of Jefferson. 3 Credits.**

Political, constitutional, cultural, and economic developments in United States during formative period of Republic, 1787-1828. Special attention to Constitutional Convention, formation of national political institutions. Prerequisite: graduate standing.

**HIST 7004. Topics in History - Social Science. 3 Credits.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Graduate students will be expected to complete additional reading and writing assignments commiserate with graduate level course requirements. Prerequisite: departmental consent. May be repeated to maximum of 6 hours.

**HIST 7010. The Age of Jackson. 3 Credits.**

This course will examine American politics, society and culture in the 1820's, 1830's, and 1840's. Considerable attention will be devoted to Andrew Jackson himself, as a figure who both shaped and represented his era, for better or worse. Graduate Standing Required.

**HIST 7020. United States History from 1800-1860. 3 Credits.**

American history from the Jeffersonian "revolution" in 1800 to the election of 1860 focuses on major discussion topics including the War of 1812, Jacksonian democracy, the growth of slavery, westward expansion, reform movements, and the coming of the Civil War. Prerequisite: graduate standing.

**HIST 7030. History of the Old South. 3 Credits.**

Study of the South to 1860. Prerequisite: graduate standing.

**HIST 7040. Houses Divided: Society and Politics in the Civil. 3 Credits.**

All major aspects of the period considered; rivalry between nationalizing and sectionalizing forces emphasized. Prerequisite: graduate standing.

**HIST 7050. American Colonial History to 1760. 3 Credits.**

Study of colonial America; special emphasis on creation of a native American culture prior to 1760. Prerequisite: graduate standing.

**HIST 7060. The Period of the American Revolution, 1760-1789. 3 Credits.**

Analysis of the Revolution, its causes and consequences, through establishment of the new government in 1789. Prerequisite: graduate standing.

**HIST 7070. Indians and Europeans in Early America. 3 Credits.**

A study of the cultural, political and often military struggle that took place for control of North America from contact through mid 19th century emphasizing native efforts to resist European domination and expansion in areas that became the U.S. and Canada. Prerequisite: graduate standing and History [HIST] 1100 or equivalent.

**HIST 7080. American Foreign Policy from Colonial Times to 1898. 3 Credits.**

(same as Peace Studies [PEA\_ST] 7080).

**HIST 7085. Problems in History. 1-99 Credit.**

(same as South Asia Studies [S\_A\_ST] 8085). Individual work not leading to dissertation. Prerequisite: graduate standing and instructor's consent.

**HIST 7100. American Cultural and Intellectual History to 1865. 3 Credits.**

Origins and growth of American values and ideas considered in their social context. Topics include: the work ethic, republican politics, revivalism, reform movements, sexual attitudes, literature in the marketplace, Afro-American and slave-holding subcultures. Prerequisite: graduate standing.

**HIST 7200. American Cultural and Intellectual History Since 1865. 3 Credits.**

Tensions and transformations in American culture to the present. Topics include: spiritual crisis in Christianity; rise of welfare state liberalism;



socialist and feminist alternatives; literature and the arts. Prerequisite: graduate standing.

**HIST 7210. Origins of Modern America, 1877-1919. 3 Credits.**

Political, social, economic, and intellectual evolution of America into a modern society, 1877-1918. Prerequisite: graduate standing.

**HIST 7220. U.S. Society Between the Wars 1918-1945. 3 Credits.**

Detailed examination of American history from end of World War I to end of World War II. Prerequisite: graduate standing.

**HIST 7230. Our Times: United States Since 1945. 3 Credits.**

Detailed examination of American history from end of World War II to the present. Prerequisite: graduate standing.

**HIST 7240. History of the New South. 3 Credits.**

Study of the South since 1860. Prerequisite: graduate standing.

**HIST 7250. U.S. Foreign Relations, 1898-1945. 3 Credits.**

A history of American Foreign Policy from the Spanish American War to the end of World War II. Prerequisite: graduate standing.

**HIST 7260. The Age of Ascendancy: U.S. Foreign Relations, 1945-Present. 3 Credits.**

(same as Peace Studies [PEA\_ST] 7260). Surveys the Cold War in Europe and Asia, the Korean and Vietnam Wars, and Middle East policy. Prerequisite: graduate standing.

**HIST 7270. African-Americans in the Twentieth Century. 3 Credits.**

(same as Black Studies [BL\_STU] 7270). Surveys the African-American experience from 1900 to the present. Attention is given to economic, political, social, and cultural trends. Prerequisite: graduate standing.

**HIST 7280. America in the Reagan Years. 3 Credits.**

Examines the major political, economic, social, and cultural currents and developments of the "Long Eighties," from Jimmy Carter's "malaise speech" of July 1979 to Bill Clinton's mid-1990s embrace of welfare reform and pronouncement that the era of big government was over.

**HIST 7310. Adoption Child Welfare and the Family, 1850-present. 3 Credits.**

(same as Women and Gender Studies [WGST] 7310) This interdisciplinary U.S. history course will address topics such as: changing legal and social meanings of adoption since 1850; historical connections between adoption and poverty, family, gender, race, sexuality, class, fertility, identity; and more recent issues such as transnational adoption. Graduate standing required.

**HIST 7410. Introduction to U.S. Social History. 3 Credits.**

Study of daily life and the ways ordinary Americans experienced historical change. Considers such topics as work, leisure, family and community. Compares how people's experiences varied by region, class, gender, ethnicity, and race. Prerequisite: graduate standing.

**HIST 7415. African Americans and American Justice. 3 Credits.**

(same as Black Studies [BL\_STU] 7415) This course provides opportunities to review and discuss selected court cases and legislation in which black men, women, or children were plaintiffs and defendants or affected by the laws. Graduate standing required.

**HIST 7420. American Urban History. 3 Credits.**

Growth, development and implications of the city in American history; historical analysis of urban problems. Prerequisite: graduate standing.

**HIST 7430. The Great West in American History. 3 Credits.**

Historical development of major regions, with emphasis on response to environment, public land policy, role of government in economic and

resource development, citizen action, and cultural pluralism. Prerequisite: graduate standing.

**HIST 7440. History of the American Environment. 3 Credits.**

A reading and discussion course exploring diverse responses to the changing American environment from early man to the present, including ecological, institutional, and philosophical aspects. Prerequisite: graduate standing.

**HIST 7470. Quantitative Methods in Historical Study. 3 Credits.**

Introduces quantitative approaches to the study of history. Emphasizes opportunities, limitations, and dangers involved in several common forms of quantitative study. Prerequisite: graduate standing.

**HIST 7480. War Crimes and Genocide. 3 Credits.**

This course will explore the development of international law, international consciousness, and U.S. foreign policy on the two distinct but often related issues of war crimes and genocide during the late 19th and throughout the 20th centuries.

**HIST 7500. Philip II and Alexander the Great of Macedonia. 3 Credits.**

Concentrates on the history and politics of Greece during reigns of these two kings along with Alexander's military conquests and various controversies from the period. Prerequisite: graduate standing or instructor's consent.

**HIST 7510. Crime and Punishment: Law in Classical Athens. 3 Credits.**

Examines the main principles of Athenian law and judicial procedures including history of law code and study of actual speeches from a variety of law suits and procedures. Prerequisites: graduate standing.

**HIST 7515. Power and Oratory in Ancient Greece. 3 Credits.**

Concentrates on the rise of oratory in Greece and how oratory was exploited for political ends. Special attention will be paid to the Athenian Democracy in the fifth and fourth centuries BC. Prerequisites: graduate standing required; instructor's consent.

**HIST 7530. The Roman Empire. 3 Credits.**

Roman imperialism; management of, and rebellion in, the Empire; cultural exchange between Rome and its provinces. Prerequisite: graduate standing.

**HIST 7540. The Later Roman Empire. 3 Credits.**

Political, religious and cultural life in Late Antiquity, from the "soldier emperors," to the barbarian kingdoms and early Byzantium. Prerequisite: graduate standing.

**HIST 7550. Age of the Vikings. 3 Credits.**

Scandinavia and Scandinavian expansion in the Central Middle Ages. Covers political, economic, religious, and cultural effects of the Viking movement. Prerequisites: History [HIST] 1500, 1540, 1600 or 2560 recommended; graduate standing or instructor's consent.

**HIST 7555. Medieval France. 3 Credits.**

This course covers the area that became the kingdom of France from the end of the Roman era until the end of the Hundred Years War; emphasize on political and cultural developments. Graduate standing required, consent of instructor required.

**HIST 7560. The Crusades. 3 Credits.**

Survey of the European crusading movement from its inception in the late eleventh century to its decline during the later Middle Ages. Prerequisites: graduate standing or instructor's consent.

**HIST 7570. Intellectual History of Europe, 17th and 18th Centuries. 3 Credits.**

The Enlightenment's attack on traditional Christian thought and values.  
Prerequisite: graduate standing.

**HIST 7580. Intellectual History of Europe, 19th and 20th Centuries. 3 Credits.**

Topics include: Romanticism, Darwin, Marx and Freud. Prerequisite: graduate standing.

**HIST 7610. Early Modern Britain, 1450-1688. 3 Credits.**

Study of English politics, society, economy, culture, and religion during primarily the Tudor and Stuart eras, from the establishment of the Tudor dynasty (1485) through the Glorious Revolution. Emphasis on social and religious history. Prerequisite: graduate standing.

**HIST 7620. Modern England. 3 Credits.**

Surveys British history in the 18th and 19th centuries. Emphasizes social and economic change. Prerequisite: graduate standing.

**HIST 7630. The Age of the Renaissance. 3 Credits.**

Major changes in European economic, social, political, religious, and intellectual life between 1250-1500. Humanism and Renaissance. The "Renaissance problem." Prerequisite: graduate standing.

**HIST 7640. The Age of the Reformation. 3 Credits.**

State of Europe about 1500. Political, diplomatic, social, and intellectual changes to 1648. Humanistic reform movements. Protestant-Catholic Reformation. Development of the modern state and international relations. Prerequisite: graduate standing.

**HIST 7650. Revolutionary France, 1789-1851. 3 Credits.**

Revolutionary upheavals of the revolutionary-Napoleonic era, which destroyed traditional French society and laid the basis for modern France. Prerequisite: graduate standing.

**HIST 7660. European Women in the 20th Century. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7660). Examines the history of European women from World War I to the present. The course focuses on wars, migration, and the changing nature of family, work and community. Prerequisite: graduate standing.

**HIST 7670. Germany in the Nineteenth Century. 3 Credits.**

Cultural, social and political history of Central Europe from 1800 to 1914. A case study in incomplete modernization, focused on industrialization, unification, cultural crisis and imperialism. Prerequisite: graduate standing.

**HIST 7680. Germany in the Twentieth Century. 3 Credits.**

Cultural, social and political history from 1914 to present day. Focus on world wars, national socialism, the holocaust, the cold war and the emergence of East and West Germany. Prerequisite: graduate standing.

**HIST 7700. Imperial Russia, 1682-1825. 3 Credits.**

Russia in the 18th and early 19th centuries, with special emphasis on the reigns of Peter I, Catherine II, and Alexander I. Prerequisite: graduate standing.

**HIST 7710. The Russian Revolution. 3 Credits.**

Analyzes the transformation of Russian society that produced the collapse of autocracy, efforts to create a parliamentary government, the Bolshevik seizure of power in 1917, and the civil war that followed. Prerequisite: graduate standing.

**HIST 7800. Modern Japan and China--A Comparative Survey. 3 Credits.**

A structured, comparative examination of the histories and cultures of Japan and China, from the mid-19th century to the present. Orientation towards broad social, intellectual and political developments. Prerequisite: graduate standing.

**HIST 7840. History of the Mongols. 3 Credits.**

In the 13th century, the Mongols went from warring tribes to the largest Eurasian empire in history. This course examines the Mongol tribes, Chinggis Khan's unification of the tribes, the Mongols rapid military victories across Eurasia and their equally rapid decline.

**HIST 7850. Traversing the Muslim World. 3 Credits.**

The traveler's tale formed an important part of the medieval world's system of knowledge. This writing intensive discussion-based course examines a wide array of the most influential travelers in Muslim lands such as Ibn Fadlan, Ibn Battuta, Benjamin of Tudela and Marco Polo.

**HIST 7860. Indian Army as Colonial Army. 3 Credits.**

This writing intensive discussion-based course examines how the Indian Army acted as a colonial army in the British Empire, including Africa, the Boxer Rebellion, and the World Wars. Focus is on the role of the Indian Army, impact of the Sepoy Mutiny, and martial race ideology.

**HIST 7870. Southeast Asia Since the Eighteenth Century. 3 Credits.**

The general objective of this course is to introduce students to the fascinating world of Southeast Asia. We will look at the shared history of commodity, cultural, and religious exchanges that gave this region a collective character, as well as explore the historical conditions from which individual modern Southeast Asian state emerged. Prerequisite: graduate standing required.

**HIST 7880. Chinese Migration in Modern Times. 3 Credits.**

This course surveys Chinese emigration in the global context over the span of five centuries. We will pay special attention to the changing relationships between China and Chinese migrants. Our emphasis will be on history as a process of negotiation and contestation of heterogeneous groups or individuals through creative and selective activities. Graduate Standing Required.

**HIST 8000. Studies in American Colonial History. 3 Credits.**

Readings in American history from beginning of English settlements to adoption of the Constitution. May be repeated to a maximum of 6 hours.

**HIST 8001. Seminar in the History of Colonial America. 3 Credits.**

Directed research in the colonial and revolutionary period of American history. May be repeated to a maximum of 6 hours.

**HIST 8004. Topics in History-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: graduate standing, and department consent. May be repeated to maximum of 6 hours.

**HIST 8010. Studies in American Religious History, 1750-1850. 3 Credits.**

This class will examine important ideas and trends in the field, with an emphasis on popular religious movements. This is a reading-based seminar, revolving around discussion of influential recent books. May be repeated to a maximum of 6 hours.

**HIST 8015. Seminar in American Religious History. 3 Credits.**

The purpose of this course is for students to write an original work of scholarship, such as might be publishable in an academic journal or serve as a dissertation or book chapter. The field is open to topics in American religious history, including the social, cultural, political and

intellectual history of American religion. Graded on A/F basis only.  
Graduate standing required.

**HIST 8020. Seminar in the National Period of United States History. 3 Credits.**

Directed research in the period 1787-1861. May be repeated to a maximum of 6 hours.

**HIST 8021. Studies in the Age of the Federalists and the Jeffersonians. 3 Credits.**

Directed readings in American history from the Constitution to the election of Jackson; class periods devoted to critical evaluation. May be repeated to a maximum of 6 hours.

**HIST 8022. Studies in the Age of Jackson 1824-1850. 3 Credits.**

Continuation of History 8021, from election of Jackson to Civil War. May be repeated to a maximum of 6 hours.

**HIST 8030. Studies in Sectional Controversy, Civil War and Reconstruction. 3 Credits.**

Directed readings and discussions of major issues in the period of national unification of the United States, from 1850 through 1877. May be repeated to a maximum of 6 hours.

**HIST 8031. Seminar in United States Sectionalism, Civil War & Reconstruction. 3-12 Credit.**

Directed original research on political and related topics of the period 1848-1877. May be repeated to a maximum of 6 hours.

**HIST 8085. Problems in History. 1-99 Credit.**

(same as South Asia Studies [S\_A\_ST] 8085). Individual work not leading to dissertation. Prerequisite: instructor's consent.

**HIST 8089. Masters Research in History. 1-99 Credit.**

Work equal to research done for a dissertation, but not leading to thesis. Prerequisite: instructor's consent.

**HIST 8090. Masters Research in History. 1-99 Credit.**

Graded on a S/U basis only.

**HIST 8210. Studies in Recent United States History. 3 Credits.**

Critical evaluation of writing in American history in period 1929-present. May be repeated to a maximum of 6 hours.

**HIST 8211. Seminar in Recent United States History. 1-12 Credit.**

Advanced seminar in American history from 1929 to present. May be repeated to a maximum of 12 hours.

**HIST 8220. Studies in American Religious History, 1850-2000. 3 Credits.**

The purpose of this course is to discuss important ideas and trends in the history of American religion from about 1850-2000. This period is currently one of the richest fields in American historical scholarship, and this is particularly the case for American religious history. Prerequisite: graduate standing required; consent required. Graded on A/F basis only.

**HIST 8400. Studies in U.S. Women's History. 3 Credits.**

Reading, discussion, and analysis of the historiography of the field. May be repeated to a maximum of 6 hours.

**HIST 8401. Seminar in U.S. Women's History. 3 Credits.**

Directed research and writing in American women's history. May be repeated to a maximum of 6 hours.

**HIST 8405. Studies in Gender. 3 Credits.**

Studies in recent research material focused on the analysis of the intersections of gender, race and class in particular times and places. May be repeated to a maximum of 6 hours.

**HIST 8410. Independent Readings for History Ph.D. Comprehensive Examination. 1-99 Credit.**

Independent readings for Ph.D. Comprehensives. Open only to graduate students formally admitted to candidacy for Ph.D. in history.

**HIST 8415. Studies in African-American History. 3 Credits.**

(same as Black Studies [BL\_STU] 8415). Readings on selected topics in African-American history from 1619 to the present, with emphasis on conflicting interpretations. May be repeated to a maximum of 6 hours.

**HIST 8416. Seminar in African-American History. 3 Credits.**

(same as Black Studies [BL\_STU] 8416). Directed research in selected topics in African-American history. May be repeated to a maximum of 6 hours.

**HIST 8425. Seminar in United States Immigration History. 3 Credits.**

The course will focus on historiography of American immigration, mainly European immigrants during 1820-1920. Special attention given to books and articles published in the past 25 years. May be repeated to a maximum of 6 hours.

**HIST 8432. Studies in Rural Social History of the United States. 3 Credits.**

This course surveys the historiography of rural social history of the United States using a comparative regional perspective and presenting a chronological overview of the nineteenth and twentieth centuries.

**HIST 8435. Seminar in American Cultural and Intellectual History. 1-12 Credit.**

Directed research and writing in American cultural and intellectual history. May be repeated to maximum of 6 hours.

**HIST 8436. Studies in American Cultural and Intellectual History. 3 Credits.**

Reading and discussion designed to promote critical understanding of theoretical and historiographical problems in American cultural and intellectual history. May be repeated to maximum of 6 hours.

**HIST 8440. Studies in American Western and Environmental History. 3 Credits.**

Readings, class discussion, and written analysis on topics in American Western and environmental history from early settlement to the present. May be repeated to a maximum of 6 hours.

**HIST 8441. Seminar in American Western and Environmental History. 3-6 Credit.**

Directed research in problems in American Western and environmental history. May be repeated to maximum of 6 hours.

**HIST 8445. Studies in World Environmental History. 3 Credits.**

Readings explore relationship between human agency and environmental change over the courses of world history and on various continents. Prerequisite: graduate standing. May be repeated to a maximum of 6 hours.

**HIST 8450. Studies in the History of the South. 3 Credits.**

Group readings and appraisal of controversial interpretations in Southern history. May be repeated to a maximum of 6 hours.

**HIST 8455. Studies in the History of American Diplomacy. 3 Credits.**

Readings in evolution of American diplomacy from the Revolution to present. May be repeated to a maximum of 6 hours.

**HIST 8456. Seminar in Recent American Diplomatic Problems. 3 Credits.**

Directed research in problems of 20th-century American diplomacy. May be repeated to a maximum of 6 hours.

**HIST 8480. Historiography. 3 Credits.**

Acquaints graduate students with examples of modern historical thought and practice by examining various conceptual approaches to the study of history. Departmental consent required. May be repeated to a maximum of six hours.

**HIST 8510. Seminar in Ancient History. 3 Credits.**

Readings and research on selected problems in ancient history. May be repeated to a maximum of 6 hours.

**HIST 8511. Studies in Ancient History. 3 Credits.**

Reading of standard works and recent scholarship on selected problems in ancient history. May be repeated a maximum of 6 hours.

**HIST 8531. Studies in English History. 3 Credits.**

Readings in historical literature covering period since 1660; particular reference to new interpretations of political, social developments. May be repeated to a maximum of 6 hours.

**HIST 8540. Seminar in Medieval Culture. 3 Credits.**

Investigates cultural developments in the medieval period. May be repeated to a maximum of 6 hours.

**HIST 8541. Studies in Medieval History. 3 Credits.**

Readings in medieval history and historiography with emphasis on current scholarship. May be repeated to a maximum of 6 hours.

**HIST 8542. Seminar in Medieval Paleography. 3 Credits.**

This course provides an introduction to medieval and Renaissance manuscript-sources and their use as research-tools in a fairly wide variety of sub-fields (e.g., archival study, scholastic text-analysis, vernacular literature). Graduate Standing Required. Department consent and competence in Latin grammar required. Graded A-F only.

**HIST 8550. Seminar in the Renaissance and Reformation. 3 Credits.**

Analyzes problems of the period 1300-1600; emphasizes intellectual history. May be repeated to a maximum of 6 hours.

**HIST 8551. Studies in Early Modern European History. 3 Credits.**

Readings in historical classics and current scholarship on Renaissance, Reformation, Baroque, and Enlightenment periods. Problem of modernity. May be repeated to a maximum of 6 hours.

**HIST 8570. Studies in Modern European History. 3 Credits.**

Readings in recent research material on selected topics. May be repeated to a maximum of 6 hours.

**HIST 8800. Studies in Latin American History. 1-6 Credit.**

Readings in standard and recent historical literature, with critical discussion of reports on special topics. May be repeated to a maximum of 6 hours.

**HIST 8820. Studies on India in World History. 3 Credits.**

This course is designed to introduce graduate students to major themes of South Asian history as well as to show how South Asian history may be integrated into world history survey course. Graduate standing required, consent of department required. Graded on A/F basis only.

**HIST 8830. Studies in Muslim History. 3 Credits.**

This course is designed to introduce graduate students to major themes in Muslim history, to supplement their current studies, and to provide a background necessary to teach surveys in world history, the modern

world, or interdisciplinary studies. Graduate standing required, consent of department required. Graded on A/F basis only.

**HIST 9089. PhD Research in History. 1-99 Credit.**

Work equal to research done for a dissertation, but not leading to thesis. Prerequisite: instructor's consent.

**HIST 9090. PhD Research in History. 1-99 Credit.**

Graded on a S/U basis only.

## Honors-General (GN\_HON)

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**GN\_HON 1010H. Career Explorations. 1 Credit.**

Colloquia in which experts from both the University and the Columbia communities discuss their specialties and answer students' questions on the nature and current status of their disciplines. Open primarily to freshmen. Graded on an S/U basis only. Honors eligibility required.

**GN\_HON 1030H. Honors Discussion Groups. 1-2 Credit.**

Informal discussion between students and faculty on various academic topics. Honors eligibility required. Graded S/U only.

**GN\_HON 1050H. Honors Seminar. 1-3 Credit.**

Freshman-sophomore seminar offering a small group opportunity to write about and discuss basic works chosen by instructor. Honors eligibility required.

**GN\_HON 1070H. Honors Elective Colloquium. 2-3 Credit.**

Honors eligibility required.

**GN\_HON 1080H. Honors Internship. 1-3 Credit.**

Independent study under the supervision of a regular faculty member. Prerequisite: written proposal with professor's approval submitted in advance to Director of the Honors College. Honors eligibility required.

**GN\_HON 1090H. Independent Study-Service Learning. 1-3 Credit.**

Students participate in community service activities, attend regular meetings, conduct research, submit four journals, a short bibliography and a research paper on their service in the community. Honors eligibility required.

**GN\_HON 2010. Honors Tutorial. 1-3 Credit.**

Small group of students (2-5) engage in collaborative work under faculty guidance. The focus is determined in advance by a faculty member and shaped through discussion with the enrolled students. Prerequisite: instructor's consent. Course may be repeated for credit.

**GN\_HON 2010H. Honors Tutorial. 1-3 Credit.**

Small group of students (2-5) engage in collaborative work under faculty guidance. The focus is determined in advance by a faculty member and shaped through discussion with the enrolled students. Course may be repeated for credit. Prerequisite: instructor's consent. Honors eligibility required.

**GN\_HON 2015H. Theory and Practice of Tutoring Writing Seminar. 3 Credits.**

(same as English [ENGLSH] 2015H). Addresses both the theory and practice of tutoring and the foundations of good writing. This course also qualifies students for a part-time job working as Writing Lab/Online Writery tutors in future semesters. Prerequisites: English [ENGLSH] 1000; instructor's consent.

**GN\_HON 2021. MU Community Engagement Project. 2-3 Credit.**

The MU Community Engagement Project offers students the opportunity to engage in academically-based community services; project sections

include tutoring and mentoring, public health policy and outreach, international services, and community development.

**GN\_HON 2021H. MU Community Engagement Project - Honors. 2-3 Credit.**

The MU Community Engagement Project offers students the opportunity to engage in academically-based community services; project sections include tutoring and mentoring, public health policy and outreach, international services, and community development. Honors eligibility required.

**GN\_HON 2022. HCCIP Head Start. 3 Credits.**

Students provide individualized attention to high-risk, low-income pre-school children 3-5 hours per week directing enrichment activities.

**GN\_HON 2022H. HCCIP Head Start - Honors. 3 Credits.**

Students provide individualized attention to high-risk, low-income pre-school children 3-5 hours per week directing enrichment activities. Honors eligibility required.

**GN\_HON 2024. HCCIP Public Health. 3 Credits.**

HCCIP Public Health course enhances and supports the service learning experience by exploring areas of public health and volunteerism for students considering health-related careers. Students work 3-5 hours per week on service projects.

**GN\_HON 2024H. HCCIP Public Health - Honors. 3 Credits.**

HCCIP Public Health course enhances and supports the service-learning experience by exploring areas of public health and volunteerism for students considering health-related careers. Students work 3-5 hours per week on service projects. Honors eligibility required.

**GN\_HON 2027. Honors College Community Involvement Program. 3 Credits.**

Course offers students the opportunity to become involved in the community, study service ethics, citizenship and leadership, and participate in the FIG program.

**GN\_HON 2027H. Honors College Community Involvement Program - Honors. 3 Credits.**

Course offers students the opportunity to become involved in the community, study service ethics, citizenship and leadership, and participate in the FIG program. Honors eligibility required.

**GN\_HON 2029. HCCIP Literacy Project. 3 Credits.**

A service-learning outreach program designed to assist members of the community and offer students problem solving and leadership. Graded on A/F basis only.

**GN\_HON 2029H. HCCIP Literacy Project - Honors. 3 Credits.**

A service-learning outreach program designed to assist members of the community and offer students problem solving and leadership. Graded on A/F basis only. Honors eligibility required.

**GN\_HON 2085H. Honors Problems. 1-3 Credit.**

Independent study under the supervision of a regular faculty member. Prerequisite: written proposal with professor's approval submitted in advance to Director of the Honors College. Honors eligibility required.

**GN\_HON 2111H. The Ancient World. 3 Credits.**

The reading list is comprised of the great writers of classical Greece and Rome such as Homer, Sophocles, Plato, Aristotle, Virgil and Apuleius, and of the biblical period, the authors of the Book of Job and the Gospel of Mark. Honors eligibility required.

**GN\_HON 2112H. The Middle Ages and the Renaissance. 3 Credits.**

The literature, art and philosophy which reflect the interaction of biblical thought with the classical past, and ultimately an emerging humanism, form the contents of the second semester. Readings include selections from such central figures as Aquinas, Chaucer, Dante, and Shakespeare. Special lectures are presented on the art, architecture and music of these eras. Honors eligibility required.

**GN\_HON 2113H. The Early Modern World: The 17th-19th Centuries Enlightenment. 3 Credits.**

The third segment of the Sequence treats the cultural developments in the West from the Baroque to the Enlightenment through Romanticism. The works of Cervantes, Descartes, Milton, Voltaire, Kant, Austen, Goethe, and Dickinson are among those studied. The music and visual arts of these periods are also included. Honors eligibility required.

**GN\_HON 2114H. The Modern Era. 3 Credits.**

The final semester of the Humanities Sequence deals with the intellectual and cultural developments from the mid-nineteenth to the late twentieth century. Lectures and discussions will be held on the philosophy of Marx, Nietzsche, Sartre and Hannah Arendt; on the literary works of Dickens, Dostoevsky, James Joyce, Virginia Woolf, T.S. Eliot, and Toni Morrison. Special lectures are presented on the music of the period. Honors eligibility required.

**GN\_HON 2117H. The Emerging Canons of the Americas. 3 Credits.**

Students will explore the issues of canonicity and the emerging works of Native American, Caribbean, Afro-Latin American, Asian American and Latino writers comparatively on the conceptions of colonialism, power and resistance, cultural and racial identity, hybridity, tradition and change. Honors eligibility required.

**GN\_HON 2120H. Honors Humanities Colloquium. 2-3 Credit.**

Honors eligibility required.

**GN\_HON 2230H. Honors Social Science Colloquium. 2-3 Credit.**

Honors eligibility required.

**GN\_HON 2243H. Human Sciences Sequence I: Personal Identity. 3 Credits.**

Part of the Honors College sequence on human nature, this course focuses on behavioral scientific studies of personal identity. Will draw on classic and modern works that investigate the self, its development, and its relationships to others. Honors eligibility required.

**GN\_HON 2244H. Human Sciences Sequence II: Identity in Groups. 3 Credits.**

Part of the Honors College sequence on human nature, this course focuses on behavioral scientific studies of identity in relation to groups. Will draw on classic and modern works that examine how people identify and are identified with groups, and the effects of those processes. Honors eligibility required.

**GN\_HON 2245H. Human Sciences Sequence III: Identity in Modern Nations. 3 Credits.**

Part of the Honors College sequence on human nature, this course focuses on social scientific studies of modern society and the individual's role in it. Will draw on classic and modern works that investigate the rise of modern society and its influences on its members. Honors eligibility required.

**GN\_HON 2246H. Human Sciences Sequence IV: Globalization and Social Identity. 3 Credits.**

Part of the Honors College sequence on human nature, this course focuses on social scientific studies of the forces of globalization and

their influences on the individual. Will draw on classic and modern works that investigate the interdependencies of modern global society. Honors eligibility required.

**GN\_HON 2310H. Honors Behavioral Science Colloquium. 2-3 Credit.**  
Honors eligibility required.

**GN\_HON 2450H. Hnrs Biological, Physical, Math (Computer Sci) Science Colloquium. 2-3 Credit.**  
Honors eligibility required.

**GN\_HON 2461H. Environment: From Molecules to the Cosmos. 3 Credits.**

Inquiry-based exploration of how the world was made, environments formed, life evolved, and how it works together to sustain life on Earth. Graded on A/F basis only. Honors eligibility required.

**GN\_HON 2462H. Energy: From Particles to Civilizations. 3 Credits.**  
Inquiry based exploration of energy, what it is, how it is used, and how it sustains our life on Earth. Graded on A/F basis only. Honors eligibility required.

**GN\_HON 2950H. Honors Preceptorship. 2-3 Credit.**  
Active participation in a professor's research for up to six hours a week. Prerequisite: written description of the work with professor's approval submitted in advance to Director of the Honors College. Honors eligibility required.

**GN\_HON 3028. Civic Leaders Internship. 3-6 Credit.**  
Students in any major may enroll in 3-6 credit hour internships with state government offices and agencies. Prerequisite: consent and application required.

**GN\_HON 3028H. Civic Leaders Internship - Honors. 3-6 Credit.**  
Students in any major may enroll in 3-6 credit hour internships with state government offices and agencies. Prerequisite: consent and application required. Honors eligibility required.

**GN\_HON 3070H. Honors Electives Colloquium. 2-3 Credit.**  
Honors eligibility required.

**GN\_HON 3120H. Honors Humanities Colloquium. 2-3 Credit.**  
Prerequisite: junior standing. Honors eligibility required.

**GN\_HON 3210H. Honors Behavioral Colloquium. 2-3 Credit.**  
Prerequisite: junior standing. Honors eligibility required.

**GN\_HON 3230H. Honors Social Science Colloquium. 2-3 Credit.**  
Prerequisite: junior standing required. Honors eligibility required.

**GN\_HON 3450H. Honors Biological, Physical, Math (Computer Sci.) Science Colloquium. 2-3 Credit.**  
Prerequisite: junior standing required. Honors eligibility required.

**GN\_HON 4070. Advanced Honors Elective Colloquium. 2-3 Credit.**  
These courses may be cross-listed with courses in graduate or professional programs or one-of-a-kind courses which may have no other more appropriate academic home. Interdisciplinary or experimental courses are encouraged. Limited to juniors and seniors.

**GN\_HON 4950H. Honors Preceptorship. 2-3 Credit.**  
Active participation in a professor's research for up to six hours a week. Prerequisite: written description of the work with professor's approval submitted in advance to Director of the Honors College. Prerequisite: junior standing required. Honors eligibility required.

## Hospitality Management (HSP\_MGMT)

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**HSP\_MGMT 1043. Introduction to Hospitality Management. 3 Credits.**

A basic course in hospitality management operations. Review development of the industry, current trends and an analysis of the various types of operations in the hospitality industry. Restricted to students with 75 hours or less.

**HSP\_MGMT 1133. Hospitality Law. 3 Credits.**

Law as it relates to the hospitality field; theories of recovery/liability; lawsuits and their prevention; familiarization with legal arguments, lawyers, litigation and threats of litigation. May be taken concurrently with HSP\_MGMT 1043.

**HSP\_MGMT 1505. Fundamentals of Sport Venue Management. 3 Credits.**

Familiarization of the history of sport venues, types of sport venues, governance, the operations of various departments commonly found in a sport venue, design and flow of sport venues, and the concept of the Total Guest Experience. Graded A-F only.

**HSP\_MGMT 1723. Private Club Management and Operation. 3 Credits.**

Clubs as a legal entity. Organizational structure, creed, charter, and by-laws; athletic activities, master and club calendars; food and beverage departments, budgets, taxes, and the future of clubs are discussed. Field trips to local area clubs are planned.

**HSP\_MGMT 1991. Food Service Sanitation Management. 1 Credit.**

Basic principles of food service sanitation safety. Meets Standards for National Sanitation Certification. Graded on S/U basis only.

**HSP\_MGMT 1995. Culinary Fundamentals. 3 Credits.**

Basic principles of food purchasing and selection, scientific principals and culinary fundamentals of food products in commercial food service operations. Prerequisite: Hospitality Management [HSP\_MGMT] 1991.

**HSP\_MGMT 2123. Food Service Operational Fundamentals. 2 Credits.**

A basic training and directed work experience in selected entry-level positions, allowing students to develop skills sets in service, point of sale systems, food production, inventory and storage, performance evaluation, professionalism, and positive work relations in both the "Front" and "Back of House". Prerequisites: HSP\_MGMT 1991; concurrent enrollment with HSP\_MGMT 2143 for Food and Beverage Management Emphasis students.

**HSP\_MGMT 2143. Introduction to Food Production and Service Fundamental. 2 Credits.**

This course provides students with information on the basic principles of effective food production and service management. The primary focus is on service management, menu planning, development and maintenance of quality standards throughout the food manufacturing cycle, and determination of recipe and total food costs. Prerequisites: HSP\_MGMT 1043; concurrent enrollment with HSP\_MGMT 2123 for Food and Beverage Management Emphasis students.

**HSP\_MGMT 2385. Problems in Hospitality Management. 1-99 Credit.**

Supervised study in a specialized phase of hospitality management. Prerequisite: Hospitality Management major and departmental consent. Open only to Freshman and Sophomore students.

**HSP\_MGMT 2401. Topics in Hospitality Management. 1-99 Credit.**

Instruction in specific subject matter areas in the field of hospitality management. Open only to Freshman and Sophomore students. Instructor's consent required.

**HSP\_MGMT 2550. Practicum in Sport Venue Management. 3 Credits.**

200 hours of practical experience in a minimum of 4 components/functions of a sport venue. Prerequisite: HSP\_MGMT 1505. Restricted to Hospitality Management Majors only. Graded S/U basis only.

**HSP\_MGMT 3153. Food Service Operations Management. 3 Credits.**

In-depth study of management of systems/techniques utilized to control food, beverage and labor costs in hospitality industry with emphasis on computer applications/problems solving. Prerequisites: HSP\_MGMT 1043, HSP\_MGMT 2143.

**HSP\_MGMT 3193. Hotel Organization and Structure. 3 Credits.**

Analysis of the operating and functional departments in a modern hotel and the study of the interrelationships among the departments; five-day off-campus seminar. Prerequisites: HSP\_MGMT 1043 and instructor's consent.

**HSP\_MGMT 3233. Professional Beverage Management. 3 Credits.**

This course provides an overview and analysis of the bar and beverage industry. Students will learn and explore the managerial and operational elements of professional beverage management. An emphasis will be placed on the legal aspects of beverage services, as well as provide training on responsible service of alcohol. In addition, sensory analysis will be used to pair food and beverages. The course will also give a better understanding of world beverages and the differences within each area. Students will apply knowledge and techniques of beverage service to menu and operational development.

**HSP\_MGMT 3343. Hotel Operations and Management. 3 Credits.**

An in-depth study of management processes in non-food functions of hotels. Prerequisites: HSP\_MGMT 1043.

**HSP\_MGMT 3385. Advanced Problems in Hospitality Management. 1-99 Credit.**

Advanced study in a selected field of Hospitality Management. Prerequisite: Hospitality Management major; open only to junior and senior students; instructor's consent required.

**HSP\_MGMT 3401. Advanced Topics in Hospitality Management. 1-99 Credit.**

Instruction in specific subject matter areas in the field of hospitality management. Open only to juniors and senior students; instructor's consent required.

**HSP\_MGMT 3410. Conference and Meeting Management. 3 Credits.**

An overview of convention and meeting planning to include group business market, the role of the event planner, the various techniques and services used to meet their needs, and technology used in the convention and meeting industry. Prerequisite: HSP\_MGMT 1043 (concurrent enrollment is allowed).

**HSP\_MGMT 3415. Current Issues in Meeting and Event Management. 1 Credit.**

A 1-credit guest speaker lecture class which provides a variety of professional topics for students who focus on convention and event

management area. Prerequisite: HSP\_MGMT 1043 (concurrent enrollment is allowed).

**HSP\_MGMT 3510. Guest Service Management: Delivering the Fan Experience. 3 Credits.**

Deliver the total sport fan experience through customer service from "driveway to driveway." Leadership in delivering customer service and meeting guest expectations. Service compliance standards, communication with patrons, and proper use of technology. Prerequisite: HSP\_MGMT 1043. Instructor's consent required. Graded A/F only.

**HSP\_MGMT 3515. Sport Venue Operation Management. 3 Credits.**

Management of the departments commonly found in sport venues: box office operations, food and beverage, maintenance and housekeeping, engineering, sales and sponsorship; technology, event production and game day operations; public vs. private events; crowd control; and legal compliance. Graded on A-F basis only. Prerequisite: HSP\_MGMT 1505; open only to junior and senior students.

**HSP\_MGMT 3525. Principles of Live Entertainment Management. 3 Credits.**

An in-depth study of business practices associated with the presentation of live entertainment events including family shows and musical performances. Course topics will include artist management, contracts and riders, financial management, event production, and tour scheduling. Graded on A-F basis only. Prerequisites: HSP\_MGMT 1505 or instructor's consent; junior or senior standing.

**HSP\_MGMT 3777. Management of Gaming Operations. 3 Credits.**

Examines the history and development of gaming operations including legal, economic and psychological forces. Prerequisite: Students must be age 21 or older.

**HSP\_MGMT 4191. Seminar in Professional Development. 1 Credit.**

Readings and discussion related to professional development for the industry. Prerequisite: HSP\_MGMT 1043.

**HSP\_MGMT 4243. Strategic Management in the Hospitality Industry. 3 Credits.**

Applies functions and tools of business management to the hospitality field. Prerequisites: HSP\_MGMT 3343, HSP\_MGMT 3153 and ACCTCY 2036.

**HSP\_MGMT 4253. Hospitality Human Resources Management. 3 Credits.**

Recruitment, training, management of personnel required for operations in a hospitality business at all employment levels. Prerequisite: HSP\_MGMT 1043 or instructor's consent. Restricted to Hospitality Management Majors during early registration.

**HSP\_MGMT 4273. Hospitality Sales and Marketing Management. 3 Credits.**

Marketing of hospitality services: human factors, consumer demand, planning, professional considerations. Discussion of traditional and current marketing methods. Prerequisites: Hospitality Management [HSP\_MGMT] 1043 and completion of a minimum of 45 hours. Restricted to Hospitality Management majors during early enrollment.

**HSP\_MGMT 4320. Destination Management. 3 Credits.**

An overview of the optimal planning, development, and marketing of destination image and position in the context of the overall management plan. Prerequisites: HSP\_MGMT 1043 (concurrent enrollment is allowed).

**HSP\_MGMT 4343. International Hotel Management. 3 Credits.**

This is an international hotel management course, which covers cultural aspects of hotel management, and current trends in the hotel

management worldwide. Prerequisites: Hospitality Management [HSP\_MGMT] 1043.

**HSP\_MGMT 4353. Hotel Finance Management. 3 Credits.**

This is a finance management course designed for students who may pursue a management career in the hotel industry. Prerequisites: HSP\_MGMT 1043, 3343.

**HSP\_MGMT 4390. Optimization and Management of Food and Agricultural Systems. 3 Credits.**

(same as F\_S 4390 and AG\_S\_M 4390). This course is designed to introduce the student to the concept of layers and interacting systems within an operation and the analytical methods of modeling and simulation to make effective management decisions for optimal system design and function. Prerequisite: MATH 1100.

**HSP\_MGMT 4520. The Business of Sport Venue Management. 3 Credits.**

Financial and accounting practices, understanding the economic impact of events on the community, HR and labor relations, venue sales & marketing, contracts, working with promoters, tenant and vendor relations, negotiations and conflict resolution as related to sport venues. Prerequisites: HSP\_MGMT 1505, HSP\_MGMT 3515, HSP\_MGMT 4253, HSP\_MGMT 4273, ACCTCY 2036 or FINANC 2000. Instructor's consent required. Graded A/F basis only.

**HSP\_MGMT 4525. Sport Venue Design and Risk Management. 3 Credits.**

The study of sport venue design and flow, creating and understanding computer-aided drawings (CADD). Emergency planning and preparedness strategies to include crowd control, law enforcement coordination, first responders and security & safety. Prerequisites: HSP\_MGMT 1505, HSP\_MGMT 3515. Instructor's consent required. Graded A/F only.

**HSP\_MGMT 4940. Field Training in Hospitality Management. 1-99 Credit.**

Advanced study, observation and employment in an area of hospitality. Written reports, faculty evaluation. Prerequisites: junior or senior standing and instructor's consent.

**HSP\_MGMT 4941. Internship in Hospitality Management. 1-12 Credit.**

Combines study, observation and employment in an area of hospitality. Written reports, faculty evaluation. Prerequisites: Completion of at least 75 hours.

**HSP\_MGMT 4963. Recent Trends in Hospitality Management. 1-2 Credit.**

For upper-level and graduate students who wish additional knowledge and understanding in specific subject matter areas.

**HSP\_MGMT 4980. Special Events Management. 3 Credits.**

An overview of managing special events to include event design feasibility studies, legal compliance, promotion, safety and security, logistic, staffing, financial control and technology. Prerequisite: HSP\_MGMT 3410 and HSP\_MGMT 4320.

**HSP\_MGMT 4985. Commercial Food Production Management. 5 Credits.**

Identifies and applies the skills necessary to plan, produce, and serve meals to customers in a commercial setting. Prerequisites: HSP\_MGMT 2123 and HSP\_MGMT 3153.

**HSP\_MGMT 4994. Lodging Management Leadership. 3 Credits.**

Capstone course for Hospitality Management majors focusing on lodging management. Applies previously learned hospitality theories and

principles to solving problems found in the lodging industry. Prerequisites: HSP\_MGMT 4253.

**HSP\_MGMT 7253. Hospitality Human Resources Management. 3 Credits.**

Recruitment, training management of personnel required for advanced position in hospitality operations. Prerequisites: graduate standing; instructor's consent.

**HSP\_MGMT 7273. Hospitality Sales. 3 Credits.**

Marketing of Hospitality services: human factors, consumer demand, planning, professional considerations. Promotional methods, advertising, selling, merchandising, public relations and sales promotion. Prerequisites: graduate standing; instructor's consent.

**HSP\_MGMT 7320. Destination Management. 3 Credits.**

This course provides an overview of hospitality and tourism destination management using a system approach that integrates a variety of hospitality and tourism organizations and business. Prerequisites: HSP\_MGMT 4980 or equivalent. Consent of instructor required. Graduate standing required. Graded A/F only.

**HSP\_MGMT 7343. International Hotel Management. 3 Credits.**

Course designed for graduate students pursuing a managerial position in the Hospitality Industry to understand the value and the competitive advantage of global hotel management. Prerequisites: HSP\_MGMT 1043 and FINANC 2000. Instructor's consent required. Graded on A/F basis only. Graduate Standing Required.

**HSP\_MGMT 7353. Hospitality Financial Management. 3 Credits.**

A finance management course designed for students who may pursue a management career in the hospitality industry. Prerequisites: graduate standing; instructor's consent.

**HSP\_MGMT 7390. Optimization and Management of Food and Agriculture Systems. 3 Credits.**

(same as F\_S 7390 and AG\_S\_M 7390). This course is designed to introduce the student to the concept of layers and interacting systems within an operation and the analytical methods of modeling and simulation to make effective management decisions for optimal system design and function. Prerequisite: graduate standing; instructor's consent.

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## Human Development And Family Studies (H\_D\_FS)

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**H\_D\_FS 1520. Drop-In Child Care Programs. 3 Credits.**

Examination of appropriate planning for and experience in a drop-in child care program. Prerequisites: Human Development and Family Studies [H\_D\_FS] 3420 or equivalent and instructor's consent.

**H\_D\_FS 1600. Foundations of Family Studies. 3 Credits.**

Introduction to family studies discipline and profession. Introduces historical changes in families, diversity by race, ethnicity, class and sexual orientation, and interaction of families with neighborhoods, schools, the workplace, and larger systems.

**H\_D\_FS 1600H. Foundations of Family Studies - Honors. 3 Credits.**

Introduction to family studies discipline and profession. Introduces historical changes in families, diversity by race, ethnicity, class and sexual orientation, and interaction of families with neighborhoods, schools, the workplace, and larger systems. Honors eligibility required.



**H\_D\_FS 1610. Intimate Relationships and Marriage. 3 Credits.**

Examination of issues pertaining to intimate and marital relationships such as relationship foundation and dissolution processes, love, sex, behavioral scripts, and conflict. Diversity related to race, ethnicity, gender, and sexual orientation is explored.

**H\_D\_FS 2085. Problems in Human Development and Family Studies. 1-99 Credit.**

Graded on S/U basis only.

**H\_D\_FS 2200. Research Methods in Human Development and Family Studies. 3 Credits.**

Introduction to research methods in the social sciences. Emphasis on both qualitative and quantitative methods, as well as applied research and program evaluation. Prerequisite: sophomore standing.

**H\_D\_FS 2300. Multicultural Study of Children and Families. 3 Credits.**

Study of cultural variation in family life around the world and within America (e.g.: African-American, Hispanic American). Attention is paid to the external conditions that affect the internal workings of these families.

**H\_D\_FS 2400. Principles of Human Development. 4 Credits.**

Concepts and principles basic to an understanding of human development and learning throughout the life span. Prerequisite: English [ENGLSH] 1000.

**H\_D\_FS 2400H. Principles of Human Development - Honors. 4 Credits.**

Concepts and principles basic to an understanding of human development and learning throughout the life span. Prerequisite: English [ENGLSH] 1000. Honors eligibility required.

**H\_D\_FS 2450. Human Sexuality Across the Life Span. 3 Credits.**

An introductory survey of human sexuality including gender, love and intimacy, sexual expression and variation, sexual orientation, contraception, pregnancy and birth, sexually transmitted infections, sexual coercion, and sex in society. Sexuality within the context of intimate relationships across the life course will be emphasized.

**H\_D\_FS 3085. Problems in Human Development and Family Studies. 1-99 Credit.**

Independent work on special problems in human development and family studies. Prerequisite: instructor's consent. Graded on S/U basis only.

**H\_D\_FS 3090. Research Experience in Human Development and Family Studies. 1-6 Credit.**

Student training and engagement in research with a H\_D\_FS faculty member. Students learn about the research process and methods, and develop research skills (e.g., data collection, entry, coding, analysis) through hands-on work. Prerequisite: Human Development and Family Studies [H\_D\_FS] 2200; instructor's consent. Graded on S/U basis only. May be repeated for credit.

**H\_D\_FS 3420. Early and Middle Childhood. 3 Credits.**

Emotional, cognitive, and physical development of the child before puberty. Observation is integral part of course. Cannot receive credit for more than one of the following: Psychology [PSYCH] 2410, Human Development and Family Studies [H\_D\_FS] 3420, or Education, School and Counseling Psychology [ESC\_PS] 2500. Restricted to Education, HDFS and Pre-HDFS majors during preregistration period.

**H\_D\_FS 3430. Adolescence and Young Adulthood. 3 Credits.**

Physical, intellectual, and psychosocial maturation of adolescents and young adults within the context of life long developmental sequelae. Restricted to HDFS and Pre-HDFS majors during pre-registration period.

**H\_D\_FS 3440. Adulthood and Aging. 3 Credits.**

Examination of biological, cognitive, psychological and social changes experienced across adulthood.

**H\_D\_FS 3500. Infant-Toddler Development and Programs. 6 Credits.**

Applied cognitive, language, and social development of infants and toddlers. Emphasizes development in a child care setting and staff relations. Co-requisites: Human Development and Family Studies [H\_D\_FS] 3420.

**H\_D\_FS 3510. Curriculum and Activities for the Early Childhood Setting. 3 Credits.**

Development of curriculum for children birth through 5 in preschool setting. Also emphasizes the development of program activities for children birth through 5; and 6 through 10 in after-school care settings. Prerequisites: may be taken concurrently with Human Development and Family Studies [H\_D\_FS] 3420 and 3500 and instructor's consent.

**H\_D\_FS 3530. Foundations of Community-Based Programs for Children and Youth. 3 Credits.**

Examines non-academic community-based programming for children and youth. Experience working with these age groups. Prerequisites: Human Development and Family Studies [H\_D\_FS] 3420 or equivalent or instructor's consent. Graded on A/F basis only.

**H\_D\_FS 3600. Working With Parents. 3 Credits.**

Lecture format presenting stages of parenthood, parenting styles, the impact of relationships and culture on parenting and challenges of parenting. Developing practical field skills working with families in a service learning experience. Prerequisite: Human Development and Family Studies [H\_D\_FS] 3420.

**H\_D\_FS 3700. Child Development Laboratory. 6 Credits.**

Experience working with young children (ages 2-6 years), and applying developmentally appropriate practice. Focus on general guidance, curriculum planning, family and staff relations. Prerequisites: Human Development and Family Studies [H\_D\_FS] 3500 or equivalent and instructor's consent.

**H\_D\_FS 3720. Student Teaching Prekindergarten. 6 Credits.**

Experience working with children (2-5 years), using general guidance principles and methods for fostering creativity. Prerequisites: Human Development and Family Studies [H\_D\_FS] 3420 or equivalent and instructor's consent.

**H\_D\_FS 3730. Field Training Practicum. 3 Credits.**

Field training experiences under supervision. Prerequisite: advisor's consent. May be repeated for credit. Graded on A/F basis only.

**H\_D\_FS 3800. Children's Play. 3 Credits.**

This course is an examination of the complex phenomenon of play in children's lives. Emphasis is placed on the value of play in developmental, social, and cultural contexts. Topics include the exploration of play theories and supporting empirical evidence, play materials, various environments, violence and conflict resolution, and therapeutic uses of play. Observation and assessment of children at play and analysis of play environments is required. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2400, 3420, Psychology [PSYCH] 2410 or Education, School and Counseling Psychology [ESC\_PS] 2500 or equivalent, junior standing. Enrollment is restricted to H\_D\_FS and Pre H\_D\_FS majors during preregistration period.

**H\_D\_FS 3960. Readings in Human Development and Family Studies. 1-99 Credit.**

Readings in recent research; critical discussions.

**H\_D\_FS 4001. Topics in Human Development and Family Studies. 1-99 Credit.**

Selected current topics in field of interest.

**H\_D\_FS 4085. Problems in Human Development and Family Studies. 1-99 Credit.**

Independent work on special problems in human development and family studies. Prerequisites: instructor's consent. Graded on S/U basis only.

**H\_D\_FS 4090. Advanced Research in Human Development and Family Studies. 1-6 Credit.**

Advanced training and engagement in research with a H\_D\_FS faculty member. Student develops research skills (e.g., data collection, entry, coding, analysis) and works semi-independently on own research project. Prerequisite: Human Development and Family Studies [H\_D\_FS] 2200 and 3090; instructor's consent. Graded on S/U basis only. May be repeated for credit.

**H\_D\_FS 4100. Children in Health Care Settings. 3 Credits.**

Overview of the medical conditions and treatments commonly encountered by children and adolescents in health care settings and their typical reactions to them. Introduction to the philosophy and the role of the child life profession. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2200, 2400 and 3420, or equivalent. Restricted to Human Development and Family Studies [H\_D\_FS] and Pre- Human Development and Family Studies [H\_D\_FS] majors during pre-registration period.

**H\_D\_FS 4110. Child Life Theory and Practice. 3 Credits.**

Focuses on theoretical foundations and principal intervention strategies used in Child Life professional practice. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2200, 3420, 3500 or 3700, and instructor's consent.

**H\_D\_FS 4130. Child Life Practicum. 3 Credits.**

Observation of Child Life staff at Children's Hospital and experience helping children and adolescents cope with hospitalization. Prerequisites: Human Development and Family Studies [H\_D\_FS] 3500 and 3700, consent required.

**H\_D\_FS 4200. Latino/a Youth and Families. 3 Credits.**

Current issues in theory, methods, and research in U.S. Latino/a youth and families are examined from a social and developmental psychological perspective. The course is an advanced level study, with a particular focus on history, theories, methods, research, and applied social issues. Topics will include, parenting, siblings, youth development and adjustment, stress, risky behaviors, gender issues, assessment, study design, cultural values, intervention programs, and immigration issues. Prerequisites: Pre-H\_D\_FS and H\_D\_FS majors must complete H\_D\_FS 1600, H\_D\_FS 2200, H\_D\_FS 2300, H\_D\_FS 2400 .

**H\_D\_FS 4300. Black Families. 3 Credits.**

(same as Black Studies [BL\_STU] 4300). Emphasis is on the unique social, economic, religious, educational, and political environments that have affected the structure and function of the Black family. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2200 or equivalent, and junior standing.

**H\_D\_FS 4400. Childhood Death and Bereavement. 3 Credits.**

An exploration of issues that arise for children and families when facing life-threatening illness and death. The course also includes an examination of coping and helping strategies for dying and grieving children. Prerequisites: Human Development and Family Studies

[H\_D\_FS] 2200, 2400, 3420 and instructor's consent. Restricted to HDFS and Pre-HDFS majors during pre-registration period.

**H\_D\_FS 4420. Environmental Influences on Lifespan Cognition. 3 Credits.**

This course covers the change and growth of cognition through the lifespan with particular attention to how the environment influences cognition (including perception, language memory, attention executive functions, and problem solving). Prerequisite: Pre-HDFS and HDFS Majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300, 2400 and 3420.

**H\_D\_FS 4570. Development and Administration of Child Services Programs. 3 Credits.**

The development of leadership and management skills for administering community-and hospital-based programs for children. Includes an overview of office policy and procedure, staff and volunteer management, public relations, budgeting, accounts, accountability, and quality assurance. Prerequisites: Pre-HDFS and HDFS Majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300, 2400 and 3700.

**H\_D\_FS 4610. Stress in Families. 3 Credits.**

Introduction to the study of stressor events in families, such as poverty, violence within families, substance abuse, and health problems. Emphasis is on both prevention and coping. Prerequisites: Pre-HDFS and HDFS majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300 and 2400.

**H\_D\_FS 4620. Family Interaction. 3 Credits.**

Analysis of intrafamilial interaction from a systems perspective; includes comparative study of family paradigms, family subsystems, goals, and resources, boundaries, and patterns of feedback. Prerequisites: Pre-HDFS and HDFS majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300 and 2400.

**H\_D\_FS 4630. The Process of Divorce. 3 Credits.**

Examination of theory and research related to marital dissolution. The impact of divorce on children and adults, and divorce intervention strategies are considered. Prerequisites: Pre-HDFS and HDFS majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300 and 2400.

**H\_D\_FS 4640. Interpersonal Relationships. 3 Credits.**

In-depth examination of interpersonal relationships, including theoretical perspectives, research methods, relationship forms, relationship processes, and how context affects relationships. Students are introduced to the field of close relationships. Prerequisites: Pre-HDFS and HDFS majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300 and 2400.

**H\_D\_FS 4655. History of the Family in Russia. 3 Credits.**

Survey of family relations in Russia from the Kievan period. Materials drawn from child development and family studies, education, history, sociology, and literature. Prerequisite: 3 hours in Social/Behavioral Sciences.

**H\_D\_FS 4655H. History of the Family in Russia - Honors. 3 Credits.**

Survey of family relations in Russia from the Kievan period. Materials drawn from child development and family studies, education, history, sociology, and literature. Prerequisite: 3 hours in Social/Behavioral Sciences. Honor eligibility required.

**H\_D\_FS 4680. Family Communication. 3 Credits.**

(same as Communications [COMMUN] 4520). Analysis of the functions and processes of communication within families. Prerequisite: junior standing or departmental consent. May be restricted to Communication majors only during early registration.

**H\_D\_FS 4700. Children and Families in Poverty. 3 Credits.**

Study of the extent, distribution, and implications of poverty on children and families. Examination of myths and realities, social conditions, policies, and programs that contribute to or reduce poverty and its consequences. Prerequisites: Pre-HDFS and HDFS majors must complete Human Development and Family Studies [H\_D\_FS] 1600, 2200, 2300 and 2400.

**H\_D\_FS 4720. Child and Family Advocacy. 2-3 Credit.**

Study of the processes of social policies, legislation, and regulations affecting children and families at the local, state and federal levels. The course emphasizes current issues and need for citizen involvement. There will be sections restricted to Human Development and Family Studies [H\_D\_FS] majors and to Education majors. The H\_D\_FS section will be for 3 credits and the Education will be for 2 credits. Prerequisites: Pre-HDFS and HDFS majors must complete H\_D\_FS 1600, 2200, 2300 and 2400.

**H\_D\_FS 4800. Program and Curriculum Design for FACS Education in Middle and Secondary Schools. 3 Credits.**

What should a teacher do about planning for student learning in FACS? Includes objectives, lesson designs, resources, learner diversity, thinking skills, reasoning processes, articulation, legislation. Prerequisites: Teacher Development Program [TDP] 2000 and Teacher Development Program [TDP] 2020 or equivalent. Admission to Phase II, and instructor's consent.

**H\_D\_FS 4820. Assessment in Family and Consumer Sciences Education. 2 Credits.**

What should a teacher do to determine the extent to which program/lesson objectives have been achieved? Includes the selection, design, and use of a wide variety of assessment tools and techniques, and the impact of assessment on the evaluation of learners and program design. Prerequisites: admission into Phase II, Human Development and Family Studies [H\_D\_FS] 4800, and instructor's consent.

**H\_D\_FS 4830. Methods of Teaching FACS in Middle and Secondary Schools. 3 Credits.**

What should a teacher do to help students achieve learner objectives? Includes classroom management strategies, choosing and using instructional methods to stimulate thinking skills and reasoning processes, communication skills, professionalism, and public relations. Prerequisites: admission into Phase II, and instructor's consent.

**H\_D\_FS 4940. Field Experience in Family and Consumer Sciences. 1 Credit.**

Students will observe and assist in FACS classroom. Prerequisite: to be taken concurrently with Human Development and Family Studies [H\_D\_FS] 4800, and instructor's consent.

**H\_D\_FS 4941. Field Experience in Family and Consumer Sciences. 1 Credit.**

Students will be involved in real-world experiences in a FACS classroom. Prerequisites: to be taken concurrently with Human Development and Family Studies [H\_D\_FS] 4830; requires instructor's consent.

**H\_D\_FS 4942. Student Teaching FACS in Middle and Secondary Schools. 1-15 Credit.**

What guided practicum experiences will directly contribute to success as a classroom teacher? Students will teach for sixteen weeks within the state of Missouri under the supervision of an experienced FACS teacher. Prerequisites: Human Development and Family Studies [H\_D\_FS] 4800, 4820, 4830, English [ENGLSH] 1000, admittance to Phase III, and instructor's consent.

**H\_D\_FS 4970. Families and Lifespan Development Capstone. 4 Credits.**

Focus on integrating, extending, critiquing, and applying knowledge gained in the Families and Lifespan Development option within a family and lifespan development educational framework. Prerequisites: senior standing and instructor's consent. Graded on A/F basis only.

**H\_D\_FS 4971. Child Development and Education Capstone. 9 Credits.**

Practical experience working with young children (up to 10) in out-of-home care facilities. Program planning for children and working with parents. Lab hours required. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2200, 3500 and 3700, or equivalent and instructor's consent.

**H\_D\_FS 4993. Internship in Human Development and Family Studies. 1-99 Credit.**

Internships or field training experiences under supervision. Graded on S/U basis only. Prerequisite: Human Development and Family Studies [H\_D\_FS] 2200 or equivalent and instructor's consent.

**H\_D\_FS 7001. Topics in Human Development and Family Studies. 1-99 Credit.**

Selected current topics in field of interest. Prerequisite: Graduate standing required.

**H\_D\_FS 7085. Problems. 1-99 Credit.**

Independent work on special problems in human development and family studies. Prerequisites: instructor's consent. Graduate standing required. Graded on S/U basis only.

**H\_D\_FS 7100. Children in Health Care Settings. 3 Credits.**

Overview of the medical conditions and treatments commonly encountered by children and adolescents in health care settings and their typical reactions to them. Introduction to the philosophy and the role of the child life profession. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 2400 and 2420, or equivalent.

**H\_D\_FS 7110. Child Life Theory and Practice. 3 Credits.**

Focuses on theoretical foundations and principal intervention strategies used in Child Life professional practice. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 2420, 2500 and instructor's consent.

**H\_D\_FS 7130. Child Life Practicum. 3 Credits.**

Observation of Child Life staff at Children's Hospital and experience helping children and adolescents cope with hospitalization. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 2500 and 3500, consent required.

**H\_D\_FS 7231. Foundations of Youth Development. 1 Credit.**

This course provides an introduction to the field of youth development and the professions that include youth work. This course is designed to provide a foundation of knowledge that students will need to begin any course in the Great Plains IDEA Youth Development programs. Graduate

standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7233. Basic Grant Development and Management. 3 Credits.**

This course introduces students to grant development and management. This short-course is not intended to cover all aspects of grant development and management, but it will help students gain confidence in their grant development abilities and inspire them to learn more. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7252. Adult Development. 3 Credits.**

This course presents a life-span, multidisciplinary developmental framework that considers sociohistorical influences, individual differences, and concern for promoting optimal functioning. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7253. Physical Health and Aging. 3 Credits.**

This course identifies the basic physiologic changes during aging and their effects on health and disease. The focus will be on successful aging with special emphasis on physical activity and nutrition. Practical application to community settings is addressed. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7255. Aging Policy. 3 Credits.**

Policy development in the context of the economic status of the elderly populations. Retirement planning and the retirement decision; Social Security and public transfer programs for the elderly; intrafamily transfers to/from the elderly; private pensions; financing medical care for the elderly; prospects and issues for the future. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7256. Environments and Aging. 3 Credits.**

Examination of attributes of physical environments that support special needs of older people and application of this knowledge to the design and management of housing, institutional settings, neighborhoods and communities. Graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7257. Aging and the Family. 3 Credits.**

Theories and research related to personal and family adjustments in later life affecting older persons and their intergenerational relationships. Related issues including demographics are also examined through the use of current literature. Graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7259. Mental Health and Aging. 3 Credits.**

Student is introduced to the range of issues utilizing several theoretical perspectives and the systems framework. Major mental, emotional, and psychiatric problems encountered in old age are examined, along with normal processes of aging individual's personality, mental and brain functions. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7260. Women and Aging. 3 Credits.**

Women and aging is the study of theory, research and application of issues related to women and the aging experience. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7261. Biological Principles of Aging. 3 Credits.**

This course will give an overview of the normal aging process of the human body systems, environmental factors influencing normal aging, diseases and disorders associated with aging. A special topics unit will include but is not limited to interviews and observations dealing with the aging process in humans. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7262. Long-Term Care Administration. 3 Credits.**

Provides information for persons interested in leadership role in long-term care, or for those considering careers intersecting with senior living organizations. Also considers long-term care options. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 7300. Black Families. 3 Credits.**

(same as Black Studies [BL\_STU] 7300). Emphasis is on the unique social, economic, religious, educational, and political environments that have affected the structure and function of the black families. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2200 or equivalent, and graduate standing.

**H\_D\_FS 7400. Childhood Death and Bereavement. 3 Credits.**

An exploration of issues that arise for children and families when families when facing terminal illness or death. The course also includes an examination of coping and helping strategies for dying and grieving children. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 2400 and 2420.

**H\_D\_FS 7470. Problems of Development in Multicultural Context. 3 Credits.**

Within the context of socio-cultural diversity, this course covers developmental problems from conception to early adulthood. Theoretical and empirical contributions to classification, assessment, intervention, and public policy are emphasized. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2400, 1600, 2300, and 2420, or instructor's consent.

**H\_D\_FS 7500. Developing Plans of Care for Community-Dwelling Older Adults. 3 Credits.**

This applied course focuses on conducting geriatric assessments across multiple domains in order to develop holistic plans of care for older adults. Designed for students with some familiarity with the large age-graded income and health programs (e.g., Social Security, Medicare), the course examines the broad range of community resource programs designed to support more specific medical, psychosocial, and functional needs. Although service delivery varies by community, students will be trained to seek out those that are locally provided, up to and including resources providing a transitional bridge to respite and long-term care services. Prerequisite: Bachelor or Master's degree in Human Services, Social Work, Mental Health, Nursing, Physical Rehabilitation, or Psychology. Must be enrolled in Graduate Certificate in Geriatric Care Management Program. Graded on A/F basis only.

**H\_D\_FS 7520. Ethical, Legal, and Business Considerations in Geriatric Care Management. 3 Credits.**

This applied eight-week course addresses multiple issues that geriatric care managers must consider in their work with the vulnerable older population. Topics include the ethics of care management, developing cultural and spiritual competencies, legal requirements in both the fee-for-service and nonprofit settings, as well as business aspects for those considering independent practice in this growing field, including

national certification. May be repeated for credit. Prerequisites: Human Development and Family Studies [H\_D\_FS] 7500, 8021 and Personal Financial Planning [FINPLN] /H\_D\_FS 7510; Bachelor or Master's degree in human services, social work, mental health, nursing, physical rehabilitation or psychology required; must be enrolled in Graduate Certificate in Geriatric Care Management program. Graded on A/F basis only. Graduate Standing required.

**H\_D\_FS 7570. Development and Administration of Child Services Programs. 3 Credits.**

The development of leadership and management skills for administering community-and-hospital-based programs for children. Includes an overview of office policy and procedures, staff and volunteer management, public relations, budgeting, accounts, accountability, and quality assurance. Prerequisites: Human Development and Family Studies [H\_D\_FS] 2200 or equivalent, 3600 or 3700, or instructor's consent.. Graded A/F only. Graduate Standing Required.

**H\_D\_FS 7583. Personal Financial Issues of Older Adults. 3 Credits.**

(same as Personal Financial Planning [FINPLN] 7583). Principles and practice of personal finance relevant to assessing and improving the financial security of older individuals. Topics covered include sources of income, management of cash flow, credit use and abuse, risk exposure, investment management, housing, and financial planning. Financial vulnerabilities of seniors will be explored. Prerequisites: Bachelor or Master's degree in human services, social work, mental health, nursing physical rehabilitation or psychology; must be enrolled in Graduate Certificate in Geriatric Care Management program. May be repeated for credit. Graded on A/F basis only.

**H\_D\_FS 7600. Resilience in Families. 3 Credits.**

Exploration of the evolution of a resilience approach to the study of families and human development. Using a lifespan approach, students will explore resilience across time as well as within special populations such as families experiencing crisis and trauma, culturally diverse families, and military families. Graded on A/F basis only.

**H\_D\_FS 7610. Stress in Families. 3 Credits.**

Introduction to the study of stressor events in families, such as poverty, violence within families, substance abuse, and health problems. Emphasis is on both prevention and coping. Prerequisite: graduate standing.

**H\_D\_FS 7630. The Process of Divorce. 3 Credits.**

Examination of theory and research related to marital dissolution. The impact of divorce on children and adults, and divorce intervention strategies will be considered. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 1600, and 2200 or equivalent; or instructor's consent.

**H\_D\_FS 7640. Interpersonal Relationships. 3 Credits.**

In-depth examination of interpersonal relationships, including theoretical perspectives, research methods, relationship forms, relationship processes, and how context affects relationships. Students will also be introduced to the field of close relationships. Prerequisites: graduate standing.

**H\_D\_FS 7650. Family Crisis Intervention. 3 Credits.**

Individuals and families in crises are examined. Focus is on grief and loss, substance abuse, family violence, and suicidal ideation. Examination of evidence-based preventions and treatments and community resources for those affected by stress, trauma, and crises. Graded on A/F basis only.

**H\_D\_FS 7690. Family Resource Management. 3 Credits.**

Survey course of personal finance and family resource management literature to provide an overview of how individual and family members develop and exercise their capacity to obtain and manage resources to meet life needs. Resources include the self, other people, time, money, energy, material assets, space, and environment. Graded on A/F basis only.

**H\_D\_FS 7720. Child and Family Advocacy. 2-3 Credit.**

Study of the processes of social policies, legislation, and regulations affecting children and families at the local, state and federal levels. The course emphasizes current issues and need for citizen involvement. There will be sections restricted to Human Developmental and Family Studies [H\_D\_FS] majors and to Education [EDUC] majors. The Human Developmental and Family Studies [H\_D\_FS] section will be for 3 credits and Education [EDUC] will be for 2 credits. Prerequisite: graduate standing.

**H\_D\_FS 7750. Physical Function and Older Adults. 3 Credits.**

(Same as Family and Community Medicine [F\_C\_MD] 7750, Architectural Studies [ARCHST] 7640, Health Management and Informatics [HMI] 7750, Nursing [NURSE] 7750, Public Health [P\_HLTH] 7750, and Social Work [SOC\_WK] 7752). This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graded A-F only. Graduate Standing Required.

**H\_D\_FS 7751. Psychosocial Function and Older Adults. 3 Credits.**

(same as Architectural Studies [ARCHST] 7650, Family Community Medicine [F\_C\_MD] 7751, Health Management and Informatics [HMI] 7751, Nursing [NURSE] 7751, Public Health [P\_HLTH], 7751 and Social Work [SOC\_WK] 7751). This course takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**H\_D\_FS 7800. Program & Curriculum Design for FACS Education in Middle & Secondary School. 3 Credits.**

What should a teacher do about planning for student learning in FACS? Includes objectives, lesson designs, resources, learner diversity, thinking skills, reasoning processes, articulation, legislation. Prerequisites: graduate standing and Teacher Development Program [TDP] 2000 and 2020 or equivalent. Admission to Phase II, and instructor's consent.

**H\_D\_FS 7820. Assessment in Family and Consumer Sciences Education. 2 Credits.**

What should a teacher do to determine the extent to which program/ lesson objectives have been achieved? Includes the selection, design, and use of a wide variety of assessment tools and techniques, and the impact of assessment on the evaluation of learners and program design. Prerequisites: graduate standing and admission into Phase II, Human Development and Family Studies [H\_D\_FS] 4800, and instructor's consent.

**H\_D\_FS 7830. Methods of Teaching FACS in Middle and Secondary Schools. 3 Credits.**

What should a teacher do to help students achieve learner objectives? Includes classroom management strategies, choosing and using instructional methods to stimulate thinking skills and reasoning processes, communication skills, professionalism, and public relations.

Prerequisites: graduate standing and admission into Phase II, and instructor's consent.

**H\_D\_FS 7940. Field Experience in Family and Consumer Sciences Education. 1 Credit.**

Students will observe and assist in FACS classroom. Prerequisite: to be taken concurrently with Human Development and Family Studies [H\_D\_FS] 4800, graduate standing, and instructor's consent.

**H\_D\_FS 7941. Field Experience in Family and Consumer Sciences. 1 Credit.**

Students will be involved in real-world experiences in a FACS classroom. Prerequisites: to be taken concurrently with Human Development and Family Studies [H\_D\_FS] 4820, 4830, graduate standing; requires instructor's consent.

**H\_D\_FS 7942. Student Teaching FACS in Middle and Secondary Schools. 15 Credits.**

What guided practicum experiences will directly contribute to success as a classroom teacher? Students will teach for sixteen weeks within the state of Missouri under the supervision of an experienced FACS teacher. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 4800, 4820, 4830, instructor's consent. Graduate standing required.

**H\_D\_FS 8001. Topics in Human Development and Family Studies. 1-99 Credit.**

Selected current topics in field of interest.

**H\_D\_FS 8012. Family Dynamics and Intervention. 3 Credits.**

(same as Nursing [NURSE] 8010). Theories of family function and dysfunction; techniques of assessment; models of family intervention. Practicum with selected families. Prerequisite: Nursing [NURSE] 7100.

**H\_D\_FS 8085. Problems in Human Development and Family Studies. 1-99 Credit.**

Independent work on special problems in human development and family studies. Prerequisite: instructor's consent. Graded on S/U basis only.

**H\_D\_FS 8087. Seminar in Human Development and Family Studies. 1-99 Credit.**

Seminar in selected topics in human development and family studies.

**H\_D\_FS 8090. Research in Human Development and Family Studies. 1-99 Credit.**

Independent research not leading to a thesis. Report required. Graded S/U Only.

**H\_D\_FS 8100. Foundations and Principles of Family and Community Services. 3 Credits.**

This course provides an introduction to the field of family studies and related professions that involve working with individuals and families in communities. This course is designed to provide a foundation of knowledge that students will need in the Great Plains IDEA family and Community Services program. This course is organized around theory, research, and practice of Family Studies. Graded on A/F basis only.

**H\_D\_FS 8110. Developmental Perspectives on Health and Illness. 3 Credits.**

Seminar on child and adolescent development as applied to illness and hospitalization, with a focus on applying psychosocial research and theory in work with pediatric populations. Prerequisite: instructor consent; coursework in human development and experience with pediatric populations. Graded on A/F only. May be repeated for credit.

**H\_D\_FS 8200. Research Methods in Human Development and Family Studies. 3 Credits.**

Examination of the rationale for conducting scientific research; various research methods pertinent to the study of individuals over the life span, close relationships, marriages, and families; hypothesis formulation; selection of appropriate designs, instrumentation, and analysis. Prerequisite: instructor's consent.

**H\_D\_FS 8210. Theories of Human Development. 3 Credits.**

Major theories of life span human development. Attention given to structure, content, and major research critiqued for theoretical strengths. Prerequisite: 6 hours of 300-level Behavioral Sciences courses or instructor's consent.

**H\_D\_FS 8220. Family Theories. 3 Credits.**

Reviews existing family theories, their assumptions, values, propositions, and applications. Examines processes of theory testing and construction and linkages between theory and research. Prerequisite: graduate standing or instructor's consent.

**H\_D\_FS 8221. Gerontechnology. 3 Credits.**

Population aging is combining with technological advancement to create and change the world of modern older people, their families, and their communities. This course takes an interdisciplinary approach to the understanding of the biological, environmental, and social spheres where technology and gerontology meet. Graded on A/F basis only. Graduate standing required.

**H\_D\_FS 8222. Creativity and Aging. 3 Credits.**

What happens to creativity as a person ages? This unique class will help students to understand developmental and pathological changes in the brain that can lead to changes in creative output over time. Through hands-on experiences and direct association with older adults, students will grow an appreciation for creativity produced and inspired by older people. This course is intended to provide experiences that will help the student to be able to create art programs for older adults. Graded on A/F basis only.

**H\_D\_FS 8231. Management and Leadership. 3 Credits.**

This course serves as an overview of management and leadership concepts related to the operational and administrative competencies necessary in effective community-based family and youth organizations and agencies. It is designed to provide students with foundational skills and knowledge to manage day-to-day functions related to organizational systems such as human resource management, financial management, risk management, strategic planning, governance and advisory structures, and marketing. Graded on A/F basis only.

**H\_D\_FS 8232. Youth Professionals as Consumers of Research. 3 Credits.**

This course will help youth development professionals understand and evaluate the quality of research reports. Students will learn the basics of quantitative and qualitative research approaches that will enable them to understand, evaluate, and critique research articles reported in newspaper, journals or other sources. Prerequisites: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8234. Adolescents and their Families. 3 Credits.**

This course explores adolescent development in the context of the family. The bi-directional influences between adolescents and their families will be examined. Implications for professionals working with youth and families will be explored and highlighted. Prerequisite: graduate

standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8235. Administration and Program Management. 3 Credits.**

This course introduces students to the development, administration and management of youth-serving organizations. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8236. Federal and State Policies that Impact Youth Development. 3 Credits.**

This course examines various federal and state policies that effect developmental opportunities for youth. Course participants will also examine not only how policies are developed, but also why. Prerequisites: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8237. Youth Cultures and the Cultures of Youth. 3 Credits.**

This course examines the cultural contexts that affect youth from within and outside the family. Students will study social, ethnic, and educational processes that affect youth, and they will examine how history has shaped the current cultural climate of the U.S. Prerequisite: graduate standing. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8238. Program Design, Implementation and Evaluation. 3 Credits.**

The course will discuss program design, implementation, and outcome evaluation. This course will focus on planning, designing logic models, and evaluating program. Students will evaluate a community-based project. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8239. Community Youth Development. 3 Credits.**

This course focuses on community youth development from a strength-based or developmental asset approach. This approach encompasses both individual development and interrelationships with social environments. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8240. Youth Development. 3 Credits.**

This course introduces the developmental period of adolescence. Emphasis will be on developmental tasks of this life stage and influences of family and home, school, peers and other contextual forces. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8251. Perspectives in Gerontology. 3 Credits.**

An overview of current aging issues including the prevailing focus of gerontology theory and research, critical social and political issues in aging, the interdisciplinary focus of gerontology, career opportunities, and aging in the future. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8253. Physical Health in Aging. 3 Credits.**

This course identifies the basic physiologic changes during aging and their effects on health and disease. The focus will be on successful aging with special emphasis on physical activity and nutrition. Practical application to community settings is addressed. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate program.

**H\_D\_FS 8254. Gerontology Research Methods and Program Evaluation. 3 Credits.**

Overview of program evaluation, research methods and grant writing in gerontology. Includes application of quantitative and qualitative methods in professional settings. Prerequisite: graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8258. Professional Seminar in Gerontology. 3 Credits.**

An integrative experience for gerontology students designed to be taken near the end of the degree program. By applying knowledge gained in earlier course work, students strengthen skills in ethical decision-making behavior, apply these skills in gerontology-related areas such as advocacy, professionalism, family and workplace issues. Prerequisite: Completion of all other gerontology program coursework. Graduate standing required. Priority given to students in the Great Plains Idea Group master's and certificate programs.

**H\_D\_FS 8300. Advanced Seminar on Multicultural Families. 3 Credits.**

Advanced study of multicultural (racial, ethnic, social) families within American society. Attention is focused on each group's unique cultural heritage and social environment. Prerequisites: graduate standing and instructor's consent.

**H\_D\_FS 8400. Programs for Young Children. 3 Credits.**

An examination of program models that serve as a framework for curriculum in programs for children birth through age 5.

**H\_D\_FS 8420. Cognitive Development. 3 Credits.**

(Same as Psychology [PSYCH] 8420). Study of the development of reasoning, perception and language. Prerequisite: graduate standing.

**H\_D\_FS 8430. Temperament and Personality Development. 3 Credits.**

(same as Psychology [PSYCH] 8430). Intended for graduate students in psychology and related fields. This course is a survey of theory and research in the area of temperament and personality development, with emphasis on child development. Prerequisite: instructor's consent.

**H\_D\_FS 8440. Social and Emotional Development. 3 Credits.**

(Same as Psychology [PSYCH] 8440) Seminar on emotional and social development in children, with focus on research and theory on the impact of various family, school, and societal factors. Prerequisite: graduate standing.

**H\_D\_FS 8450. Adolescence and Emerging Adulthood. 3 Credits.**

Seminar on development during adolescence and emerging adulthood from biological, cognitive, psychsocial, and cultural perspectives, and with a focus on health-related attitudes and behaviors. Prerequisite: graduate standing.

**H\_D\_FS 8460. Life Course Perspective. 3 Credits.**

Seminar on the life course perspective, an interdisciplinary approach to the study of lives over time and the interplay between human lives and social institutions. Deals with how individual lives are shaped by social change and social structure. Prerequisite: graduate standing.

**H\_D\_FS 8470. Identity Development. 3 Credits.**

Uses an Eriksonian framework to explore research regarding developmental tasks related to identity, such as attachment, self-esteem, moral behavior, achievement, and the formation of an abstract sense of self. Also considers such issues as gender identity, ethnic identity, and sexual identity. Prerequisite: graduate standing or instructor's consent.

**H\_D\_FS 8510. Parenting Education. 3 Credits.**

Study of theories, models, research and skills regarding parenting effectiveness and parent-child relations in the context of Western and Eastern cultures. Included are comparisons of the relative strengths and weaknesses of various parenting approaches, historical perspective on parenthood and children, parenting roles, strategies for contemporary parenting, developmental interaction from infancy through adulthood and selected special concerns of parents. A Bio-Ecological Systems approach will be utilized in this course. Graded on A/F basis only.

**H\_D\_FS 8520. Lifespan Development. 3 Credits.**

This course covers the human development including the cognitive, social-emotional, motor, language, and moral domains from both a lifespan and a bio-ecological perspective. Course content focuses on the major theories of development as well as current research on the micro-macro interrelationship. Students who complete this course will have a better understanding of individual human developmental processes and their relationship with context and within family and community matters. Graded on A/F basis only.

**H\_D\_FS 8610. Remarriage & Stepfamilies: Development, Dynamics, & Intervention. 3 Credits.**

The processes of remarriage and reconstituted family dynamics; special developmental needs and intervention models will be studied. The impact on children is considered. Prerequisite: instructor's consent.

**H\_D\_FS 8630. Gendered Relations in Families. 3 Credits.**

(same as Women and Gender Studies [WGST] 8630). From a feminist perspective, the roles of gender in shaping family life experience and of family life experience in shaping gender will be explored. Prerequisite: graduate standing; instructor's consent. Graded on A/F basis only.

**H\_D\_FS 8640. Family Interaction. 3 Credits.**

Examination of intrafamilial interaction. Includes an overview of theories used to study family interaction, critical review of the assessment of family interaction; and examination of contemporary research on family interaction focusing on intra and intergenerational relationships. Prerequisites: graduate standing and Human Development and Family Studies [H\_D\_FS] 1600 and 2200 or equivalent; or instructor's consent.

**H\_D\_FS 8710. Children, Families and Public Policy. 3 Credits.**

Seminar on societal issues relating to children and families, with focus on the development of public policies. Prerequisites: graduate standing and instructor's consent.

**H\_D\_FS 8770. Poverty. 3 Credits.**

Implications of poverty for child, adult, and family functioning. Poverty-related policies and programs.

**H\_D\_FS 8960. Readings in Human Development and Family Studies. 1-99 Credit.**

Readings in recent research; critical evaluation. Prerequisites: graduate standing and instructor's consent.

**H\_D\_FS 8972. Internship in Human Development and Family Studies. 1-99 Credit.**

Internships and/or field training experiences under supervision. Prerequisites: graduate standing and instructor's consent. Graded on S/U basis only.

**H\_D\_FS 9090. Research in Human Development and Family Studies. 1-99 Credit.**

Independent research leading to thesis or dissertation. Graded on S/U basis only.

**H\_D\_FS 9100. Teaching Practicum. 2-6 Credit.**

Supervised experience in teaching various audiences, including college students, professionals, and community residents. Prerequisite: graduate standing and instructor's consent. Graded on S/U basis only.

**H\_D\_FS 9130. Writing Research Proposals: Skill Building. 3 Credits.**

(same as Nursing [NURSE] 9132) This course teaches the components of writing a research proposal for external funding. Prerequisites: Human Development and Family Studies [H\_D\_FS] 9200 and graduate level statistics course. Instructors permission required. PhD Students only. Graded on S/U basis only.

**H\_D\_FS 9131. Responsible Conduct of Research in Health and Social Sciences. 1 Credit.**

(same as Nursing [NURSE] 9131) This course examines professional research ethics including the rights of human subjects. Graded on an S/U basis only. Graduate Standing Required. Instructor's permission required.

**H\_D\_FS 9200. Advanced Research Methods in Human Development and Family Studies. 3 Credits.**

(same as Nursing [NURSE] 9410). Examination of issues related to the study of individuals and their families: measurement, designs, and interpretation of statistical analyses. Statistics are placed in perspective through readings and discussions of the relationships between theory, research design, and data analyses. Prerequisite: Human Development and Family Studies [H\_D\_FS] 8200 or instructor's consent.

**H\_D\_FS 9210. Research Practicum in Human Development and Family Studies. 2-6 Credit.**

Independent research activities in conjunction with faculty. Prerequisite: instructor's consent. Graded on S/U basis only.

**H\_D\_FS 9400. Macro Social Theory. 3 Credits.**

(Same as SOC\_WK 9400) An in-depth examination of human development and social environmental theories appropriate to social welfare practice in formal organizations, interorganizational combinations, communities, and larger political entities. Students may not receive credit for both H\_D\_FS 9400 and SOC\_WK 9400.

**H\_D\_FS 9420. Qualitative Methods. 3 Credits.**

(same as Nursing [NURSE] 9420) Examines the following selected qualitative research approaches appropriate for the study of nursing phenomena and the extension or modification of scientific knowledge so as to be relevant to nursing: case study research methods, verbal qualitative approaches, and nonverbal qualitative approaches. Prerequisite: Nursing [NURSE] 7150 and doctoral status (or permission of faculty). Graded on A/F basis only.

**H\_D\_FS 9550. Meta Analysis Research. 3 Credits.**

(Same as Nursing [NURSE] 9550). Examines quantitative synthesis including research questions, search strategies, coding issues, meta-analysis statistical procedures, and interpretation of findings. Emphasizes conceptual understanding and practical methods. Prerequisites: 6 hours of graduate statistics; Human Development and Family Studies [H\_D\_FS] 9200 or graduate level quantitative methods course. Graded on A-F only basis.

**H\_D\_FS 9560. Qualitative Systematic Reviews. 3 Credits.**

(Same as Social Work [SOC\_WK] 9560 and Nursing [NURSE] 9560) Examine and carry out elements of qualitative systematic reviews: topic/problem identification, data collection, and analysis. Understand how to limit threats to validity and maximize generalizability. Prerequisite: Human Development and Family Studies [H\_D\_FS] 9420 or equivalent.



**H\_D\_FS 9700. Social Welfare Policy Seminar. 3 Credits.**

(Same as Social Work [SOC\_WK] 9700) Critical examination of comparative models of social policy development; preparation of a professional social work policy analysis in the student's area of interest/specialization. Graduate Standing Required.

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## Industrial And Manufacturing Systems (IMSE)

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**IMSE 1000. Introduction to Industrial Engineering. 1 Credit.**

Introduction to industrial engineering profession, the IMSE department, and the core topics of industrial engineering. Introduction to problem solving, ethics and industrial engineering design and analysis techniques.

**IMSE 1010. Experimental Course. 1-99 Credit.**

For freshman-level students. Content and credit to be listed in the Schedule of Courses.

**IMSE 1087. Undergraduate Seminar. 0 Credits.**

Seminars are held monthly to provide a forum for departmental communication of upcoming opportunities (jobs, speakers, deadlines, etc.), speakers from industry to provide educational context, and student interaction. Required every semester of enrollment for graduation. Graded on S/U basis only.

**IMSE 2030. Fundamentals of Systems Design and Analysis. 3 Credits.**

Develop an understanding of a systems approach to the design and operation of modern industrial organizations: systems structure and function, system specification, structured problem solving and system design methodology.

**IMSE 2110. Probability and Statistics for Engineers. 3 Credits.**

Introduction to data analysis, probability concepts, random variables, parameter estimation and hypothesis testing. Prerequisite: Mathematics [MATH] 1500.

**IMSE 2210. Linear Algebra for Engineers. 3 Credits.**

Study of quantitative methods necessary for analysis, modeling and design of optimal industrial systems. Prerequisite: Computer Science [CMP\_SC] 1001, 1040, 1050 and Mathematics [MATH] 1700.

**IMSE 2410. Introduction to Information Technologies. 1 Credit.**

A survey of current technologies and their use. Different technologies will be reviewed. Examples: web search strategies, common application tools, searching and sorting on the WWW, upcoming trends and directions in information technologies. This is a web-based self-study course with instructor's guidance.

**IMSE 2710. Engineering Economic Analysis. 3 Credits.**

Fundamentals of engineering economic decision making. Includes time value of money, breakeven analysis, capital budgeting, replacement, after-tax analysis, inflation, risk, sensitivity analysis and multi-attribute analysis. Prerequisite: sophomore standing.

**IMSE 2810. Performance Measurement and Ergonomics. 3 Credits.**

Design of man-machine systems considering capabilities and limitations of the human component. Method of measuring human performance in man-machine systems; includes lab. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 2110.

**IMSE 3001. Topics in Industrial and Manufacturing Systems Engineering. 0-4 Credit.**

Current and new technical developments in industrial engineering. Prerequisite: instructor's consent. May be repeated to 6 hours.

**IMSE 3030. Manufacturing and Supply Systems. 3 Credits.**

Provide a structured approach for the design and optimization of a system throughout its lifecycle: techniques following the logical sequence of strategic analysis, system design, implementation, and monitoring. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 2030.

**IMSE 3810. Ergonomics and Workstation Design. 3 Credits.**

Ergonomics and human factors theories applied to the design of man-machine systems. Discussion of ergonomic methods for measurement, assessment, and evaluation, with major topics including workstation design, environmental stresses, and workplace safety. Includes lab. Prerequisites: Engineering [ENGINR] 1200.

**IMSE 4001. Topics in Industrial and Manufacturing Systems Engineering. 3 Credits.**

Current and new technical developments in industrial engineering.

**IMSE 4085. Problems in Industrial Engineering. 1-4 Credit.**

Supervised investigation in industrial engineering presented in form of an engineering report.

**IMSE 4110. Engineering Statistics. 3 Credits.**

Understanding and application of statistical analysis techniques. Emphasis on hypothesis testing, regression analysis, analysis of variance (ANOVA) and design of experiments (DOE). Prerequisites: Grade of C- or better in Industrial and Manufacturing Systems Engineering [IMSE] 2110.

**IMSE 4210. Linear Optimization. 3 Credits.**

Theory and application of linear optimization. Prerequisite: grade of C- or better in Industrial and Manufacturing Systems Engineering [IMSE] 2210.

**IMSE 4230. Operations Research Models. 3 Credits.**

Formulates probabilistic models and determines optimal control policies for queueing and inventory systems. Introduces Markov chains and dynamic programming. Prerequisites: grade of C- or better in Industrial and Manufacturing Systems Engineering [IMSE] 2110 and 2210.

**IMSE 4280. Systems Simulation. 3 Credits.**

Discrete-event stochastic systems modeling and experimentation using simulation software. Statistical design and analysis including distribution fitting and alternative comparison methodologies. Prerequisites: grade of C- or better in Industrial and Manufacturing Systems Engineering [IMSE] 4110, Computer Science [CMP\_SC] 1040 or 1050.

**IMSE 4310. Integrated Production Systems Design. 3 Credits.**

Design and operation of production systems, including lean production concepts, just-in-time/kanban, facility layout and material flow issues. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4210, 4280.

**IMSE 4330. Material Flow and Logistics System Design. 3 Credits.**

Modeling and analysis of structural and operational issues associated with material-flow system design including facility location, warehouse/inventory systems, and distribution/transportation systems. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4210, 4280.

**IMSE 4350. Production and Operations Analysis. 3 Credits.**

Quantitative methods for forecasting, scheduling, and production control in manufacturing and service systems. Use of Enterprise Resource

Planning (ERP) systems. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4210 and 4230.

**IMSE 4385. Lean Six Sigma Green Belt Project. 1 Credit.**

Application of the Lean Six Sigma methodology in an industry-based project. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4310.

**IMSE 4410. Management Information Systems Design. 3 Credits.**

MIS concepts and management issues, HTML for web pages and eShop (front-office operations), back-office operations using relational databases, introduction to SQL. Prerequisite: Computer Science [CMP\_SC] 1040 or 1050 and junior standing required.

**IMSE 4420. Web-Based Information Systems. 3 Credits.**

Data models, design of databases using E-R, UML (Access/Oracle), web databases, web servers and interfaces (Visual Basic, JavaScript), E-commerce infrastructure (PDM, STEP, XML), data mining for management information and services. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4410 and instructor's consent.

**IMSE 4550. Computer Aided Design and Manufacturing. 4 Credits.**

Product realization process from design, process planning, to manufacturing. Includes CE, DFS/DFM, CAD, CAPP, CNC, and survey of manufacturing methods. Prerequisites: Junior Standing.

**IMSE 4560. Introduction to Rapid Prototyping. 3 Credits.**

Course covers all five MU systems: FDM, SLS, SLA, Polyjet, 3DP. Students will learn fundamental rapid prototyping and related concepts, and design and produce models from each system. Graded on A-F basis only. Prerequisite: Sophomore standing or higher.

**IMSE 4570. Computer Integrated Manufacturing Control. 3 Credits.**

Implementation of computer integrated manufacturing (CIM) and automation at the shop floor level. Covers essential components of machine sensing and actuation (including programmable robots), information representation and processing, data communication and networking. Prerequisite: Junior Standing.

**IMSE 4610. Engineering Quality Control. 3 Credits.**

Analysis of quality in manufacturing including control charts, sampling plans, process capability, experimental design; introduction to system reliability. Overview of Six Sigma and DMAIC methodology. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4110.

**IMSE 4750. Entrepreneurial Innovation Management: Enterprise Conception. 3 Credits.**

(same as Management [MANGMT] 4750). Develop a new business and technology plan including marketing, finance, engineering, manufacturing, and production concepts in this joint College of Engineering and College of Business course. Prerequisite: sophomore standing.

**IMSE 4755H. Entrepreneurial Innovation Management: Enterprise Conception-Honors. 3 Credits.**

Develop a new business and technology plan including marketing, finance, engineering, manufacturing, and production concepts in this joint College of Engineering and College of Business course. Prerequisite: sophomore standing. Honors eligibility required.

**IMSE 4760. Entrepreneurial Innovation Management: Enterprise Design. 3 Credits.**

(same as Management [MANGMT] 4760). Expand on Industrial Manufacturing and Systems Engineering [IMSE] 4750 business/technology plan into an operations plan; advertising facilities layout,

selling and distribution channels, product designs, accounting procedures, manufacturing processes, and prototypes. Prerequisite: Industrial Manufacturing and Systems Engineering [IMSE] 4750.

**IMSE 4765H. Entrepreneurial Innovation Management: Enterprise Design-Honors. 3 Credits.**

(same as Management [MANGMT] 4765H). Expand on Industrial Manufacturing and Systems Engineering [IMSE] 4755H business/technology plan into an operations plan; advertising facilities layout, selling and distribution channels, product designs, accounting procedures, manufacturing processes, and prototypes. Prerequisite: Industrial Manufacturing and Systems Engineering [IMSE] 4755H. Honors eligibility required.

**IMSE 4770. Entrepreneurial Innovation Management: Enterprise Operations. 3 Credits.**

(same as Management [MANGMT] 4770). Perform the day-to-day operations for an enterprise by managing all business processes including finance, manufacturing, sales and delivery. Prerequisite: Junior Standing.

**IMSE 4775H. Entrepreneurial Innovation Management: Enterprise Operations-Honors. 3 Credits.**

Perform the day-to-day operations for an enterprise by managing all business processes including finance, manufacturing, sales and delivery. Honors eligibility required. Prerequisite: Junior Standing.

**IMSE 4970. Capstone Design I. 1 Credit.**

Overview of professional engineering issues such as ethics, team dynamics, communication, and project management. Includes team-based industrial assessments to develop skills in problem/opportunity identification. Prerequisite: Senior Standing.

**IMSE 4980. Capstone Design II. 3 Credits.**

Industry-based team design experience structured to integrate material presented throughout the Industrial and Manufacturing Systems Engineering [IMSE] curriculum. Must immediately follow Industrial and Manufacturing Systems Engineering [IMSE] 4970. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 3810, 4310, 4970.

**IMSE 4990. Undergraduate Research in Industrial Engineering. 0-6 Credit.**

Independent investigation or project in industrial engineering. May be repeated to 6 hours.

**IMSE 4995. Undergraduate Research Industrial Engineering - Honors. 0-6 Credit.**

Independent investigation or project in industrial engineering. Prerequisite: honors student in Industrial Engineering. May be repeated to 6 hours.

**IMSE 7001. Topics in Industrial and Manufacturing Systems Engineering. 3 Credits.**

Current and new technical developments in industrial engineering. Prerequisite: graduate standing.

**IMSE 7110. Engineering Statistics. 3 Credits.**

Understanding and application of statistical analysis techniques. Emphasis on hypothesis testing, regression analysis, analysis of variance (ANOVA) and design of experiments (DOE). Prerequisites: grade of C- or better in Industrial and Manufacturing Systems Engineering [IMSE] 2110. Graduate Standing Required.

**IMSE 7210. Linear Optimization. 3 Credits.**

Theory and application of linear optimization. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 2210.

**IMSE 7230. Operations Research Models. 3 Credits.**

Formulates probabilistic models and determines optimal control policies for queueing and inventory systems. Introduces Markov chains and dynamic programming. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 2110 and 2210.

**IMSE 7280. Systems Simulation. 3 Credits.**

Discrete-event stochastic systems modeling and experimentation using simulation software. Statistical design and analysis including distribution fitting and alternative comparison methodologies. Prerequisites: grade of C- or better in Industrial and Manufacturing Systems Engineering [IMSE] 4110, Computer Science [CMP\_SC] 1040 or 1050. Graded on A/F basis only.

**IMSE 7310. Integrated Production Systems Design. 3 Credits.**

Design and operation of production systems, including lean production concepts, just-in-time / kanban, facility layout and material flow issues. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4210, 4280. Graduate Standing Required.

**IMSE 7330. Material Flow and Logistics System Design. 3 Credits.**

Modeling and analysis of structural and operational issues associated with material-flow system design including facility location, warehouse/inventory systems, and distribution/transportation systems. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4210, 4280. Graduate Standing Required.

**IMSE 7350. Production and Operations Analysis. 3 Credits.**

Quantitative methods for forecasting, scheduling, and production control in manufacturing and service systems. Use of Enterprise Resource Planning (ERP) systems. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4210 and 4230. Graduate Standing Required.

**IMSE 7385. Lean Six Sigma Green Belt Project. 1 Credit.**

Application of the Lean Six Sigma methodology in an industry-based project. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4310. Graduate Standing required.

**IMSE 7410. Management Information Systems Design. 3 Credits.**

MIS concepts and management issues, HTML for web pages and eShop (front office operation), back-office operations using relational databases, introduction for SQL. Class graded A-F only. Prerequisites: Computer Science [CMP\_SC] 1040 or 1050.

**IMSE 7420. Web-Based Information Systems. 3 Credits.**

Data models, design of databases using E-R, UML (Access/Oracle), web databases, web servers and interfaces (Visual Basic, JavaScript), E-commerce infrastructure (PDM, STEP, XML), data mining for management information and services. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4410 and instructor's consent. Graduate Standing Required.

**IMSE 7550. Computer Aided Design and Manufacturing. 4 Credits.**

Product realization process from design, process planning, to manufacturing. Includes CE, DFS/DFM, CAD, CAPP, CNC, and survey of manufacturing methods. Graduate Standing Required.

**IMSE 7570. Computer Integrated Manufacturing Control. 3 Credits.**

Implementation of computer integrated manufacturing (CIM) and automation at the shop floor level. Covers essential components of machine sensing and actuation (including programmable robots), information representation and processing, data communication and networking. Graduate Standing Required.

**IMSE 7610. Engineering Quality Control. 3 Credits.**

Analysis of quality in manufacturing including control charts, sampling plans, process capability, experimental design; introduction to system reliability. Overview of Six Sigma and DMAIC methodology. Prerequisite: graduate standing and Industrial and Manufacturing Systems Engineering [IMSE] 4110/7110.

**IMSE 7750. Entrepreneurial Innovation Management: Advanced Enterprise Conception. 3 Credits.**

Develop a new business and technology plan (including marketing, finance, engineering, manufacturing, and production concepts) in this joint College of Engineering/College of Business course.

**IMSE 7760. Entrepreneurial Innovation Management: Advanced Enterprise Design. 3 Credits.**

Expand on Industrial and Manufacturing Systems Engineering [IMSE] 7750 business and technology plan into a business operation plan: advertising designs, facilities layout, selling and distribution channels, product designs, accounting procedures, manufacturing processes, and product prototypes. Prerequisite: IMSE 7750.

**IMSE 7770. Entrepreneurial Innovation Management: Advanced Enterprise Operations. 3 Credits.**

Perform the day-to-day operations for an enterprise by managing all business processes including finance, manufacturing, sales, and delivery. Graduate Standing Required.

**IMSE 8001. Advanced Topics in Industrial & Manufacturing Systems Engineering. 3 Credits.**

Current and new technical developments in industrial engineering.

**IMSE 8030. Advanced Manufacturing and Supply Systems. 3 Credits.**

The design, regulation, and optimization of manufacturing and supply systems through systems analysis.

**IMSE 8070. Research Methods in Industrial & Manufacturing System Engineering. 1 Credit.**

Development of research approach. Selection of topic area including techniques of literature search with special emphasis on problem definition. Topics pertinent to planning, organizing and carrying out industrial engineering research or design project.

**IMSE 8085. Problems in Industrial and Manufacturing Systems Engineering. 1-99 Credit.**

Supervised investigation in industrial engineering to be presented in the form of an engineering report.

**IMSE 8087. Industrial Engineering Graduate Seminar. 0 Credits.**

Selected topics in industrial engineering; oral presentations and engineering reports.

**IMSE 8110. Engineering Experimentation. 3 Credits.**

Application of advanced statistical methods for the analysis of engineering design and experimental problems. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4110/7110.

**IMSE 8210. Operations Research-Discrete Models. 3 Credits.**

Applications of discrete operations research methods, including linear programming, fuzzy sets, integer programming, and meta-heuristics. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4210/7210.

**IMSE 8220. Nonlinear Optimization. 3 Credits.**

Introduces computational non-linear mathematical programming procedures their use in solving complex industrial systems design

problems. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4210/7210.

**IMSE 8230. Operations Research-Stochastic Models. 3 Credits.**

Theory and applications of stochastic processes; includes continuous time Markov chain, Markov decision process, queueing theory, and stochastic manufacturing systems. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4230/7230.

**IMSE 8280. Advanced Systems Simulation. 3 Credits.**

Theory and practice of dynamic modeling and statistical experimentation. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 3280.

**IMSE 8310. Advanced Integrated Production Systems. 3 Credits.**

Advanced study of the design and operation of flow shop, job shop, and cell-based production systems, including scheduling, layout and material flow issues. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4310/7310.

**IMSE 8370. Supply Chain Modeling and Analysis. 3 Credits.**

Theory and application of supply chain networks, integration of production and inventory control methods. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 8210, 8230.

**IMSE 8410. Advanced Management Information Systems Design. 3 Credits.**

Develops requirements for management information, staffing, cost estimating, evaluation, and the design of management communication systems; includes case studies. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 3410.

**IMSE 8550. Advanced CAD/CAM. 3 Credits.**

Covers the state-of-the-art in CAD/CAM and explores the latest developments, residual problems, and new direction in CAD/CAM. Includes sculptured surface modeling, rapid prototyping and manufacturing, integrated process planning, shape analysis, machine intelligence. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4550/7550.

**IMSE 8610. Advanced Quality Systems. 3 Credits.**

Advanced process control charts, empirical model-building, fractional factorial designs and Taguchi techniques as tools for process and product improvement, professional ethics in quality management; TQM and ISO 9000. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4610, 8110.

**IMSE 8730. Strategic Enterprise Management. 3 Credits.**

Topics including enterprise strategies, process and content models, strategy implementation, value chain analysis, business processes, systems engineering approaches, business process reengineering, and dynamic systems modeling.

**IMSE 8810. Human Factors. 3 Credits.**

Human factors inputs, outputs and environment and their influence on design and evaluation of man and machine systems.

**IMSE 8850. Health Care Systems Design and Analysis. 3 Credits.**

Health care systems design principles and major problems, basic organization within health care system, alternative system design strategies, factors affecting design process success.

**IMSE 8990. Research-Masters Thesis in Industrial Engineering. 1-99 Credit.**

Independent investigation in field of industrial engineering to be presented as a thesis. Graded on S/U basis only.

**IMSE 9210. Advanced Linear Optimization. 3 Credits.**

Advanced study of linear programming, including optimization and its application including large-scale optimization, primal-dual methods, decomposition, interior point methods, convex analysis, and integer programming. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 4210/7210.

**IMSE 9230. Stochastic Service Systems. 3 Credits.**

Development and application of stochastic models in the design of service systems in which either demands for service or services supplies, or both, have a probabilistic nature. Prerequisite: Statistics [STAT] 4750, Industrial and Manufacturing Systems Engineering [IMSE] 8230.

**IMSE 9250. Dynamic Programming. 3 Credits.**

Introduces theory and computational aspects of dynamic programming; its application to sequential decision problems. Prerequisites: Industrial and Manufacturing Systems Engineering [IMSE] 4210/7210 and 4230/7230.

**IMSE 9260. Integer and Combinatorial Optimization. 3 Credits.**

Theory, solution methodology, and application of integer and combinatorial optimization. Prerequisite: Industrial and Manufacturing Systems Engineering [IMSE] 8210.

**IMSE 9990. Research-Doctoral Dissertation in Industrial Engineering. 1-99 Credit.**

Independent investigation in field of industrial engineering to be presented as a dissertation. Graded on S/U basis only.

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## Information Science And Learning Technologies (IS\_LT)

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**IS\_LT 1111. Information Use and Student Success. 1 Credit.**

In this course, students will learn to frame meaningful questions, gain knowledge and skills to succeed academically, understand the structure and content of information resources, evaluate information, and use information resources as genuine learning tools.

**IS\_LT 1111H. Information Use and Student Success - Honors. 1 Credit.**

In this course, students will learn to frame meaningful questions, gain knowledge and skills to succeed academically, understand the structure and content of information resources, evaluate information, and use information resources as genuine learning tools. Honors eligibility required.

**IS\_LT 4360. Introduction to Web Development. 3 Credits.**

Basic web design and HTML. Covers file transfer and UNIX/LINUX servers management. Develops understanding of web graphic formats. Emphasizes user interface, navigation, and instructional design in building web sites. Online. Graded on A/F basis only.

**IS\_LT 4361. Introduction to Digital Media. 3 Credits.**

Hands-on approach to multimedia production techniques. Develops understanding of image software, video software, scanners, digital cameras, digital video cameras, and graphics tablets. Graded on A/F basis only.

**IS\_LT 4364. Flash Authoring. 3 Credits.**

Teaches skills required to plan, develop and evaluate a multimedia project using digital authoring software. Emphasizes instructional design and user interface issues. Course is production-based. Graded on A/F basis only.

**IS\_LT 4370. Intermediate Web Development. 3 Credits.**

Development of design and web authoring skills. Interactivity through use of cgi scripts and javascript. Design capabilities using Style Sheets. Gain expertise required for the production of HTML documents incorporating these advanced techniques. Prerequisite: Information Science and Learning Technology [IS\_LT] 4360 or instructor's consent.

**IS\_LT 7085. Problems in Information Science and Learning Technology. 1-99 Credit.**

Independent, directed study on a topic in the field of information science and learning technologies. Prerequisite: graduate standing and departmental consent.

**IS\_LT 7301. Introduction to Information Technology. 3 Credits.**

The nature of information and information transfer in the institutional setting; covers the culture of information in society, standards for information processing and transfer, and networking in communications perspectives of information providing agencies. Prerequisite: graduate standing.

**IS\_LT 7302. Organization of Information. 3 Credits.**

An overview of the research that addresses information-seeking behavior and the history, background, and development of catalogs and indexes. Prerequisite: graduate standing.

**IS\_LT 7305. Foundations of Library and Information Science. 1 Credit.**

The course introduces students to the background, contexts, organizations, and key issues and terms related to library and information science and the information professions. Prerequisite: graduate standing.

**IS\_LT 7310. Seminar in Information Science and Learning Technology. 1-3 Credit.**

Discussion and critical study of current developments in the field of information science and learning technologies. Prerequisite: graduate standing.

**IS\_LT 7312. Principles of Cataloging and Classification. 3 Credits.**

Theory and practice of cataloging and classification of library materials using current standards and tools. Principles, developments, and trends in cataloging and access to library data. . Prerequisite: Information Science and Learning Technology [IS\_LT] 7305.

**IS\_LT 7313. Managing Collections and Access. 3 Credits.**

Selection of materials for libraries and information agencies, policies for collection management, freedom and diversity of information, access to information and evaluation of collections and access. Prerequisite: graduate standing.

**IS\_LT 7314. Reference Sources and Services. 3 Credits.**

General reference sources with emphasis on print sources. principles, developments and trends in reference services and reference service organization. Prerequisite: graduate standing.

**IS\_LT 7315. Management of Information Agencies. 3 Credits.**

Concepts of management applied to libraries and information systems; management tools, programming, models and simulation in an environment of an information producing or disseminating agency. Prerequisite: graduate standing.

**IS\_LT 7334. Library Information Systems. 3 Credits.**

Focuses on the automated library systems marketplace. Covers integrated online library systems from the systems, functional and user perspective. Includes management approaches for procurement and operation of such systems. Prerequisite: graduate standing.

**IS\_LT 7350. Special Readings in Information Science and Learning Technologies. 1-99 Credit.**

Prerequisites: graduate standing and departmental consent.

**IS\_LT 7357. Web Application Development I. 3 Credits.**

Students learn to develop Web applications to support online learning and collaboration using ASP.Net, PHP, or Java. In this course students will learn fundamental Web programming principles and develop web applications. Specific concepts taught in this course include: reading and writing files to a server, interacting with users through web forms, storing and retrieving data in relational databases (MS SQL, MySQL, or Oracle), objected-oriented programming, and web application security. Also available as 4357 for undergraduate credit. Prerequisites: Intermediate Web Development.

**IS\_LT 7358. Web Application Development II. 3 Credits.**

Building on Web Application Development I, this course covers advanced Web programming techniques and focuses on developing Web-based learning applications. With intensive programming, students will analyze and learn how the applications in existing learning environments operate and interact, and then develop learning applications of their own. Specific concepts covered in this course include task analysis, algorithms, APIs, user rights and permissions, data integrity, flexible design, code documentation, Web Services, Web for mobile handheld devices or Ajax. Also available as 4358 for undergraduate credit. Prerequisites: Web Application Development I.

**IS\_LT 7359. Database Development. 3 Credits.**

Students in this course will learn how to design and develop flexible and efficient data structures to support database driven web applications. Students will develop applications using database management systems, using the Structured Query Language (SQL), and using one of the following programming languages: Perl, PHP, or Java. Specific concepts covered in this course include database data types, table design, SQL statements, optimization, normalization, and security. Prerequisite: Information Science and Learning Technology [IS\_LT] 7357.

**IS\_LT 7360. Introduction to Web Development. 3 Credits.**

Basic web design and HTML. Covers file transfer and UNIX/LINUX servers management. Develops understanding of web graphic formats. Emphasizes user interface, navigation, and instructional design in building web sites. Online. Graded on A/F basis only. Prerequisite: graduate standing.

**IS\_LT 7361. Introduction to Digital Media. 3 Credits.**

Hands-on approach to multimedia production techniques. Develops understanding of image software, video software, and scanners, digital cameras, digital video cameras, graphics tablets. Graded on A/F basis only. Prerequisite: graduate standing.

**IS\_LT 7364. Flash Authoring. 3 Credits.**

Plan, develop, and evaluate a multimedia project using digital authoring software (Macromedia Flash). Emphasizes scripting and user interface issues for web-based animations. Course is production-based. Graded on A/F basis only. Prerequisite: graduate standing.

**IS\_LT 7366. Technology Leadership in Schools. 3 Credits.**

Develop skills, knowledge, and values needed to provide leadership in schools. Analyzes characteristics of effective leaders, focusing on staff development. Explores technology and school reform, technology integration, and current issues. Online. Graded on A/F basis only. Prerequisite: graduate standing.

**IS\_LT 7368. Technology Across the Curriculum. 3 Credits.**

The emphasis in this course is on using technologies to enhance and support student collaboration and learning in K-23 classrooms. Prerequisite: admission to the Teaching Fellowship Program.

**IS\_LT 7370. Intermediate Web Development. 3 Credits.**

Development of design and web authoring skills. Interactivity through use of cgi scripts and javascript. Design capabilities using Style Sheets. Gain expertise required for the production of HTML documents incorporating these advanced techniques. Prerequisite: graduate standing and Information Science and Learning Technology [IS\_LT] 7360 or instructor's consent.

**IS\_LT 7377. Introduction to Technology in Schools. 3 Credits.**

Study of theories and practices associated with educational technology. Explores basic instructional design processes and strategies for integrating technology into teaching and learning. Provides an overview of the EdTech field and a survey of emerging trends. Prerequisites: teaching experience or instructor's consent; graduate standing required.

**IS\_LT 7378. Electronic Portfolio Development. 3 Credits.**

Prerequisite: graduate standing and instructor's consent.

**IS\_LT 7380. School Library Practicum. 1-3 Credit.**

Directed, project-based experience in school libraries. Prerequisites: admission to MA, initial certification or 24 completed LIS credit hours taken at MU; instructor permission.

**IS\_LT 7381. Practicum in Information Agencies. 1-3 Credit.**

Provides a supervised work experience for master's degree students in a public, academic, or special library. Prerequisite: Information Science and Learning Technologies [IS\_LT] 7301, 7302 or 7312, 7314, 7315. Graded on S/U basis only.

**IS\_LT 7466. Computers as Cognitive Tools. 3 Credits.**

Computer-based cognitive tools provide multiple formalisms for representing student knowledge and engage learners in critical, creative, and complex thinking. Cognitive tools include databases, semantic networks, spreadsheets, expert systems, systems modeling, and microworlds, information interpretation and visualization, knowledge construction, and conversation. Prerequisite: graduate standing.

**IS\_LT 7822. College Teaching with Technology I. 1 Credit.**

(same as Education Leadership and Policy Analysis [ED\_LPA] 7822). Examines the use of educational technologies, both classroom-based (e.g., student response systems) and online (e.g., course management systems), to assist in the dissemination of course resources and the facilitation of student interaction.

**IS\_LT 7823. College Teaching with Technology II. 1 Credit.**

(same as Education Leadership and Policy Analysis [ED\_LPA] 7823). Integrates learning technologies into the traditional framework of a face-to-face course by creating a course website and developing technical proficiency with relevant educational technologies. Prerequisite: College Teaching I or instructor's consultation.

**IS\_LT 9085. Problems in Information Science and Learning Technology. 1-99 Credit.**

Independent, directed study on a topic in the areas of information science and learning technologies. Prerequisite: graduate standing; departmental consent.

**IS\_LT 9090. Research in Information Science and Learning Technologies. 1-99 Credit.**

Dissertation research. Graded on S/U basis only. Prerequisite: Doctoral Committee Chair's consent.

**IS\_LT 9404. School Library Administration. 3 Credits.**

Program development, budget process, planning cycle, evaluation; resources and services for diverse school stakeholders. Effects of national, state, district guidelines, standards and policies on P-12 School libraries. Course maybe repeated for credit.

**IS\_LT 9406. Curriculum and the School Library. 3 Credits.**

Focuses in integrating the school library program and collections with curriculum emphasizes diverse student learning styles, role of the school librarian as teacher; use of electronic resources for research, teaching and learning.

**IS\_LT 9408. Information Policy. 3 Credits.**

Examination of the roles of private and public sectors in information policy formation. Includes consideration of social, economic, political and technological issues.

**IS\_LT 9409. Seminar in Digital Libraries. 3 Credits.**

This course is a project-based learning environment that combines Instructor-prepared content, group-based student projects, and threaded asynchronous discussions on selected topics relating to the design, development, and implementation of practical digital libraries. Research directives within the broad domain of digital library development are also covered.

**IS\_LT 9410. Seminar in Information Science and Learning Technology. 1-3 Credit.**

Discussion and critical study of current developments in information science and learning technologies.

**IS\_LT 9412. Information Storage and Retrieval. 3 Credits.**

Introduces students to concepts and terminology associated with the storage and retrieval of bibliographic information. Emphasizes design of applied database management systems.

**IS\_LT 9413. Management of Electronic Resources. 3 Credits.**

This course explores electronic resources (primarily subscription journals and databases) in terms of products, pricing, in-house management of resources, both technical and organizational, licensing, configuring databases and organizing websites for the end user, statistical reporting, and future trends. Graduate Standing Required.

**IS\_LT 9414. Internet Reference. 3 Credits.**

Learn to examine and evaluate web sites, about different search engines, and how to use web sites to answer basic reference questions. Prerequisite or corequisite: Information Science and Learning Technology [IS LT] 7314.

**IS\_LT 9417. Technology Action Research. 3 Credits.**

Study of concepts associated with action research; and the processes and procedures for conducting action research. Culminating project is the development of an action research project. Prerequisite: 12 credit hours completed prior to enrolling.

**IS\_LT 9420. Information in the Disciplines. 3 Credits.**

Provides an understanding of how and why information is produced, stored and communicated in various intellectual disciplines. Students evaluate examples of these activities in specific disciplines.

**IS\_LT 9423. Ethics and Information. 3 Credits.**

This course introduces basic concepts of ethics and focuses on applying ethical norms to the production, dissemination, and use of information. The information services offered by libraries are also examined within the context of ethics. Graduate Standing Required.

**IS\_LT 9428. The History of Books and Printing: The Printed Book. 3 Credits.**

Focuses on the social, cultural, intellectual, and religious elements of books and print culture. The impact on communication and society is especially emphasized. Prerequisites: departmental consent.

**IS\_LT 9431. Children's Library Materials. 3 Credits.**

Evaluation and selection of materials for children birth-age 13 (Grade 6). Early literacy, emergent readers, reader response theory; social, cultural contexts of readers and reading, trends in publishing.

**IS\_LT 9432. Online Searching. 3 Credits.**

Search strategies and techniques for commercial online databases. The course first covers the basic concepts of online information retrieval and then focuses on selection and online searching in the most prominent social science, science, humanities, and numerical databases. Prerequisite: Information Science and Learning Technology [IS\_LT] 4301/7301 and 4314/7314.

**IS\_LT 9433. Youth Services in Libraries. 3 Credits.**

Examines physical, mental, and emotional development of youth birth through high school. Emphasis on community analysis, outreach services, program design and techniques. Graded on A/F basis only.

**IS\_LT 9434. Teen Library Materials. 3 Credits.**

Evaluation, selection of print, alternate formats for teens, 13-18 (Grades 7-12). Personal, social, popular culture contexts of teen readers and texts; emphasizes reader response; challenges common assumptions about teens and reading.

**IS\_LT 9435. Adult Services in Libraries. 3 Credits.**

Library services to adults, including special populations. Emphasis on information needs of adults, organization and management of adult services.

**IS\_LT 9437. Reader Advisory Services. 3 Credits.**

Examination of value and role of leisure reading and leisure reading materials. Coverage of reader advisory techniques, support processes, and resources for providing reader advisory services to various audiences. Graded on A/F basis only.

**IS\_LT 9440. Learning with the Internet. 3 Credits.**

Explores the potential of the Internet to support inquiry-based learning through collaborative activities, research, and authoring/publishing. Investigates goals and strategies of online learning. Examines learning theories and models of teaching/learning in relation to selected Internet activities for K-12 students.

**IS\_LT 9443. The Academic Library. 3 Credits.**

Development, objectives, organization and structure, nature of the collections and responsibility for their development, philosophy of library services, measurement and standards of library effectiveness.

**IS\_LT 9444. The Public Library. 3 Credits.**

Objectives, relations with other institutions, scope of library services, public relations, standards. w, alt. s.

**IS\_LT 9445. Special Libraries and Information Centers. 3 Credits.**

Goals of special librarianship including information provision, management styles. Library functions as performed in special libraries. Contributions of special libraries, such as information analysis centers, information brokering, and accountability for and evaluation of services.

**IS\_LT 9446. International and Comparative Librarianship. 3 Credits.**

International libraries, intercultural information concerns, how information agencies differ between nations and global information issues. Course

presents various countries, their information infrastructures and the influence of information and communication technologies. Graduate Standing Required.

**IS\_LT 9449. Business Information Resources. 3 Credits.**

The course covers the basic concepts of business information and the information searching techniques used for specific business information needs (finding company information, industry information, investment information, statistical information, marketing information, etc.) Graduate Standing Required.

**IS\_LT 9450. Introduction to Research in Library and Information Science. 3 Credits.**

Examination of the nature, utility, and methodologies of research in the profession. Emphasis is on understanding and evaluating potential and actual research.

**IS\_LT 9452. Library Use Instruction. 3 Credits.**

This course considers learning theory applicable to instruction, learning styles, teaching methods, and appropriate evaluation of library use instruction. Students learn strategies for incorporating library instruction into the institutional curriculum.

**IS\_LT 9453. Planning and Evaluation of Information Services. 3 Credits.**

The course focuses on the complexity of the planning process in libraries and other information agencies, including the influence of external environments (upper administrations, user communities, information producers) on planning. Internal elements of the organization (staffing, services, finances) are discussed, as are external elements (requirements of a parent organization, legal constraints, etc.). The role of evaluation of personnel, budgets, facilities, access to information, and services is integrated into the process of providing service. Graduate Standing Required.

**IS\_LT 9454. Copyright in Libraries. 3 Credits.**

An introductory and practical course covering the foundations of copyright, fair use, e-reserves, related laws including DMCA and TEACH and managing copyright in the public and school environments. Graduate Standing Required.

**IS\_LT 9455. Formative and Summative Evaluation. 3 Credits.**

Study of the process of gathering data and making judgments about the effectiveness of instructional programs that uses technology. Covers techniques of a formative evaluation process to revise instruction. Culminating project is planning and conducting a portion of a summative evaluation of instructional program.

**IS\_LT 9456. Designing Computer Support for Collaborative Learning. 3 Credits.**

Students will examine the theoretical bases for using collaboration and social interaction as methods for learning, and learn key methods and approaches for designing computer supported collaborative learning. Graded A?F only.

**IS\_LT 9457. Designing Computer Support for Cooperative Work. 3 Credits.**

Study of the tools and methods of groupware and communities of practice, including their psychological, social and organizational effects. Students focus on designing and developing improved tools and methods. Graded on A/F basis only.

**IS\_LT 9458. Technology and Assessment. 3 Credits.**

Learn how to assess specific types of knowledge, using technology to enhance the process. Explore innovative tools and means of assessment

that help teachers individualize and differentiate instruction to improve learning. Develop technology-enhanced assessment of student learning. Graded on A/F basis only.

**IS\_LT 9459. Designing Direct Instruction. 3 Credits.**

This course focuses on strategies for implementing a systems approach to designing instruction. Emphasis is placed on learning-prerequisite analysis, part-to-whole content organization, and a presentation-practice-feedback instructional sequence. Prerequisite: graduate standing. Graded on A/F basis only.

**IS\_LT 9461. Interaction Design. 3 Credits.**

Students will learn the basic concepts of interaction design, then focus on usability engineering and prototyping principles to support the design process for learning and performance based technologies.

**IS\_LT 9467. Technology to Enhance Learning. 3 Credits.**

Strategies for integrating technology into the teaching and learning process, with a focus on enhancing how students think rather than what they think. Special attention given to supporting higher order thinking and problem solving with technology. Prerequisite: graduate standing.

**IS\_LT 9468. Learning and Task Analysis. 3 Credits.**

Multiple methods for conducting task analysis for learning to identify learning processes, learning topics, and learning experiences, including procedural, prerequisites, cognitive simulations, case libraries, environmental analysis, and decision making.

**IS\_LT 9469. Designing Electronic Performance Support Systems. 3 Credits.**

Performance support systems (PSS) are technology systems that support human activity within the complexities of organizational requirements and processes. Students build competency for designing PSS.

**IS\_LT 9471. Instructional Systems Design. 3 Credits.**

Development of skills and knowledge related to the systematic design of instruction. Emphasis is placed on content analysis, instructional strategies, and formative evaluation. Prerequisites: course in Curriculum or Instruction or instructor's consent.

**IS\_LT 9472. Designing and Modeling Systems. 3 Credits.**

Examination of living systems, general systems theory, and the art and practice of the learning organization.

**IS\_LT 9473. Project Management. 3 Credits.**

This course introduces the learner to the necessary and practical project management concepts and skills that lead to reductions in project cycle time while maintaining control over budget, resources, risk, and delivered value. This course proposes to integrate practical project management skills within the project management lifecycle (i.e., initiating, planning, executing, controlling, and closing).

**IS\_LT 9474. Needs Assessment for Learning and Performance. 3 Credits.**

Analyze learning and performance needs and opportunities using a systemic framework and associated strategies and techniques. Develop needs assessment instruments, collect data, and prepare recommendations for improvement. Prerequisite: graduate standing.

**IS\_LT 9475. Diffusion of Educational Innovations. 3 Credits.**

In-depth analysis of innovation development and adoption processes in educational organizations, including schools, universities, and training centers.

**IS\_LT 9476. Instructional Design Models and Strategies. 3 Credits.**

This course introduces learners to fundamentals concepts of instructional design strategies. To provide an anchor for the design concepts and strategies studied, the course offers a project and case-based approach to learning instructional design skills. Emphasis is placed on the design of learning resources most appropriate for the goals of the instruction being created and implementing these strategies and tactics in an instructional program.

**IS\_LT 9478. Designing Problem-Based Learning Environments. 3 Credits.**

Based on theories of situated learning, constructivism, everyday cognition, case-based reasoning, and activity theory, students will design and develop a learning environment that engages learners in constructive learning and problem solving with emphasis on assessing higher-order learning. Graded on A/F basis only.

**IS\_LT 9480. Internship in Information Science and Learning Technologies. 1-99 Credit.**

Provides internship experience under supervision in advanced levels of practical experience in Information Science and Learning Technology Research and Teaching. Graded on S/U basis only. Prerequisite: School director's consent.

**IS\_LT 9483. Capstone: Online Educator Focus Area. 1 Credit.**

Culminating course for Online Educator focus in Educational Technology graduate degree. Design/develop/evaluate an online course or rework existing course. Analyze evaluation data from two external reviewers (novice/expert). Write paper describing results and modifications. To be taken during last semester of student's program. Graded on S/U basis only.

**IS\_LT 9484. Teaching Online Courses. 3 Credits.**

Examines emerging issues in teaching and learning online; instructor and student roles; instructional strategies for supporting diverse learners; methods of student assessment; online communication; classroom management; characteristics of online learning management systems. May be repeated for credit.

**IS\_LT 9485. Designing and Implementing Online Courses. 3 Credits.**

Students will practice designing online lessons for meaningful learning outcomes such as knowledge construction, building models, knowledge transmission, and community building and working collaboratively, and learn essential online course implementation skills. Graduate standing required.

## **Information Technology (INFOTC)**

**INFOTC 1001. Topics in Information Technology. 3 Credits.**

Topics may vary from semester to semester. May be repeated upon consent of department.

**INFOTC 1610. Introduction to Entertainment Media. 3 Credits.**

This course is an introduction to the basic fundamentals of entertainment products such as postproduction technology, camera and lighting technology, audio creation and mixing technology, and broadcast technology. Computer programs designed for visual special effects are used.

**INFOTC 2001. Topics in Information Technology. 3 Credits.**

Topics may vary from semester to semester. May be repeated upon consent of department. Graded on A/F basis only.



**INFOTC 2600. Digital Multimedia. 3 Credits.**

This course introduces broad views of concepts, software, hardware, and solutions in entertainment media applications. It will examine career options in fields such as information technology, news, film production and postproduction, website design, advertising, or communication.

**INFOTC 2610. Audio/Video I. 3 Credits.**

This is an introductory course on digital audio and video editing. Background presented in the course will include an overview of the techniques used in modern Non-Linear video editing, and understanding of block editing, and why it is essential when using modern digital technology. The course is hands-on with students at workstations, learning the software directly at the keyboard, and working on assignments in a lab context.

**INFOTC 2620. Computer Modeling and Animation I. 3 Credits.**

Introduction to the field of computer modeling and animation with an emphasis on tools. Learn programming methods for developing customized modeling and animation algorithms. Prerequisites: Computer Sciences [CMP\_SC] 1050, and 2050 concurrently. Graded on A/F basis only.

**INFOTC 2810. Fundamentals of Network Technology. 3 Credits.**

This course includes an overview of networking and the common wireless standards. Prerequisites: Computer Sciences [CMP\_SC] 1050. Graded on A/F basis only.

**INFOTC 2910. Cyber Security. 3 Credits.**

This course covers numerous platform-independent security topics including threats, problem ports and services, theory and practice of defense in security, intrusion detection, data security, securing remote access, user education and support, designing a secure network and security management. Prerequisites: Computer Sciences [CMP\_SC] 1050, Information Technology [INFOTC] 2810. Graded on A/F basis only.

**INFOTC 3001. Topics in Information Technology. 3 Credits.**

Topics may vary from semester to semester. May be repeated upon consent of department. Graded on A/F basis only.

**INFOTC 3610. Audio/Video II. 3 Credits.**

This course presents broad professional techniques for completing an off-line edit and the progression to online and finishing, adding depth to topics introduced in A/V I. Students will gain experience in editing techniques involving dialogue, action, documentaries, music videos, and multi-camera projects. The course also introduces special effects, audio finishing, clip and media management, and use of various media formats. Prerequisites: Information Technology [INFOTC] 2610 and co-requisites Computer Sciences [CMP\_SC] 2050.

**INFOTC 3620. Computer Modeling and Animation II. 3 Credits.**

This course covers advanced methods for modeling and animation with an emphasis on computer science theory and virtual reality. Prerequisites: Information Technology [INFOTC] 2620 and Computer Science [CMP\_SC] 2050. Graded on A/F basis only.

**INFOTC 3630. Introduction to Game Design. 3 Credits.**

This class will focus on the theory, design, and implementation of games. Students will learn about designing and implementing vital components for modern game engines, with respect to data structures, algorithms, content, development tools, and optimization strategies. In addition, students will use the Valve Source Engine (used to power Half-Life 2) to develop their own mod. The final project is a fully functional game. Prerequisite: Information Technology [INFOTC] 2620, Computer Science [CMP\_SC] 2050.

**INFOTC 3640. Digital Effects. 3 Credits.**

This course is an introduction to the fundamentals of digital motion picture effects technology. This course is designed for a student interested in pursuing a career in information technology, news, film production and film postproduction, website design, or communication. Prerequisites: Information Technology [INFOTC] 1610 or 2610.

**INFOTC 3850. Computer System Administration. 3 Credits.**

This course will cover network management tools, network maintenance, data management, remote access management, management tasks, responsibilities and ethics, required plans and policies, design of a well-managed network. Some work will be done in both Windows and Linux environments. Prerequisites: Computer Science [CMP\_SC] 2050, junior standing. Graded on A/F basis only.

**INFOTC 4001. Topics in Information Technology. 3 Credits.**

Topics may vary from semester to semester. May be repeated upon consent of department. Graded on A/F basis only.

**INFOTC 4390. Database Administration. 3 Credits.**

This course is designed to give a firm foundation in Database Administrators' tasks. The primary goal is to give necessary knowledge and skills to setup, maintain and troubleshoot an Oracle database. This is an instructor-led course featuring lecture and hands-on exercises. Online demonstration and written practice sessions reinforce the concepts and skills introduced. The course defined objectives are designed to support preparation for the Oracle Certified Professional examination. Prerequisites: CMP\_SC 4380.

**INFOTC 4400. C#/.NET Development. 3 Credits.**

Learn how to develop and debug multi-threaded Windows desktop applications based on the object-oriented (OO), Model-View-Controller (MVC), and Model View ViewModel (MVVM) paradigms using C#, .NET, Windows Presentation Foundations (WPF), and Visual Studio. Prerequisite: Computer Science [CMP\_SC] 2050. Graded on A/F basis only.

**INFOTC 4500. Team-Based Mobile Device Application Development. 3 Credits.**

This is a multi-disciplinary, team-based course on developing applications for mobile devices. Teams will be comprised of students who are software developers and students who are designers. Prerequisites: Computer Science [CMP\_SC] 2050 (for CMP\_SC/INFOTC majors) and instructor's consent. Graded on A/F basis only.

**INFOTC 4630. Game Design II. 3 Credits.**

This course explores 1) the manual and procedural development of static and dynamic game content, 2) programming for gameplay, interactivity, UI, game Artificial Intelligence, and 3) algorithms, ADTs, and research vital to game design. Prerequisite: Information Technology [INFOTC] 3630.

**INFOTC 4640. Digital Effects II. 3 Credits.**

This course builds on fundamentals of digital motion picture effects technology learned in Digital Effects I. Computer programs designed for digital visual special effects in film and broadcast are integrated throughout the course. Prerequisites: Information Technology [INFOTC] 3640.

**INFOTC 4650. Shader Programing. 3 Credits.**

The focus of this course is modern computer graphics algorithms and programming, with an emphasis on games, shader languages, (GLSL and Cg) and Graphical Processor Units (GPUs). Prerequisites: Computer Science [CMP\_SC] 2050, Information Technology [INFOTC] 2620.

## **Integrative Neuroscience (NEUROSCI)**

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### **NEUROSCI 7990. Non-Thesis Research in Neuroscience. 1-3 Credit.**

The course is intended primarily for post-baccalaureate students who have not entered a formal graduate program but who are performing neuroscience research. Graduate standing required. Consent of instructor required. Graded on A/F basis only.

### **NEUROSCI 8020. Advances in Neuroscience and Neuropathology. 1-3 Credit.**

In depth review of recent advances in basic neuroscience research as well as pathological conditions affecting nervous systems at the cellular and systems level, and the methods and techniques used to study the nervous system. Graduate standing required. Graded on A/F basis only.

### **NEUROSCI 8090. Thesis Research in Neuroscience. 1-6 Credit.**

The course is intended primarily for graduate students who are working with mentors in departments that do not offer courses (e.g. Radiology). Graduate standing required. Consent of instructor required. Graded on A/F basis only.

### **NEUROSCI 8187. Neuroscience Journal Club. 1 Credit.**

In depth readings and presentations/discussions of neuroscience journal articles including recent advances in basic neuroscience research, pathological conditions affecting nervous systems, and neuroscience techniques. Graduate Standing required. Graded on S/U basis only. May be repeated for credit.

### **NEUROSCI 8440. Integrative Neuroscience I. 3 Credits.**

(same as BIO\_SC 8440). Organization, development and function of the nervous system focusing on cellular and molecular processes. Graduate standing required. Graded on A/F basis only.

### **NEUROSCI 8442. Integrative Neuroscience II. 3 Credits.**

(same as BIO\_SC 8442). Organization and function of the nervous system at the systems level to examine processes of behavior and cognition. Graduate standing required. Graded on A/F basis only.

### **NEUROSCI 9090. Thesis Research in Neuroscience. 1-6 Credit.**

The course is intended primarily for graduate students who are working with mentors in departments that do not offer courses (e.g. Radiology). Graduate standing required. Instructor consent required. Graded on A/F basis only.

## **Interdisciplinary Studies (INTDSC)**

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### **INTDSC 1001. Proseminar in Interdisciplinary Studies. 1 Credit.**

Lecture/discussion survey of time-management, note taking techniques, in the context of the three courses that are part of a Freshman Interest Group. Regular use of library, electronic mail and computing facilities is stressed. Elective credit only; students cannot receive credit for Interdisciplinary Studies [INTDSC] 2001 and Interdisciplinary Studies [INTDSC] 1001 or 1150. Graded on S/U basis only.

### **INTDSC 1020. University Freshmen Seminar. 1 Credit.**

(same as Student Success Center [SSC] 1020). To maximize student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by collegiate life. Attainment of an appropriate balance between personal freedom and social responsibility underlies all seminar activities. Prerequisite:

Restricted to first time college student. No credit for students who have earned credit for Agriculture, Food and Natural Resources [AFNR] 1115, Interdisciplinary Studies [INTDSC] 1001, Information Science and Learning Technology [IS\_LT] 1110, Education Leadership and Policy Analysis [ED\_LPA] 3100 or an equivalent first year orientation course at another institution. Credit restrictions that apply to orientation classes apply to this course. Students are not allowed to be enrolled in Student Success Center [SSC] 1020 and Student Success Center [SSC] 1150 in the same semester.

### **INTDSC 1940. Internship. 0-1 Credit.**

Limited to freshmen/sophomores who are "undecided" or otherwise not accepted into a major. Graded on S/U basis only.

### **INTDSC 2001. Proseminar in Interdisciplinary Studies. 1 Credit.**

Lecture/discussion survey of a range of issues of special importance for transfer students new to the University. Elective credit only; no credit for Interdisciplinary Studies [INTDSC] 1001 and/or Student Success Center [SSC] 1150. Graded on A/F basis only.

### **INTDSC 2940. Internship in Interdisciplinary Studies. 1-6 Credit.**

Internship limited to students pursuing the BA in Interdisciplinary Studies degree. Graded on S/U basis only.

### **INTDSC 2960. Readings in Interdisciplinary Studies. 1-6 Credit.**

Independent readings with supervisory faculty member. Open only to Interdisciplinary Studies majors. May be repeated up to a maximum of 6 hours.

### **INTDSC 4940. Internship in Interdisciplinary Studies. 1-6 Credit.**

Internship limited to students pursuing the BA in Interdisciplinary Studies degree. Graded on S/U basis only. Departmental Consent Required.

### **INTDSC 4960. Readings in Interdisciplinary Studies. 1-6 Credit.**

Independent readings with supervisory faculty member. Open only to Interdisciplinary Studies majors. May be repeated up to a maximum of 6 hours.

### **INTDSC 4970. Service Learning Project.. 3-6 Credit.**

Independent readings with supervisory faculty member; Students will engage in service activities, directly relevant to their areas of academic emphasis, in community not-for-profit agencies. At the same time as participants work in the community, they will research their agency and organization, undergo mock employment interviews, create a cover letter and resume based on the professional skills they have gained through their service, and reflect on careers and leadership in public service. Restricted to Interdisciplinary [INTDSC], General [G\_STDY] and International [INTL\_S] studies students. Graded A-F only.

### **INTDSC 4971. Capstone Internship in Interdisciplinary Studies. 1-6 Credit.**

Internship experience which serves as the student's capstone experience. Program advisor must approve internships. Graded on S/U basis only. Section 2 of this course will be designated for Service Learning Capstone experience.

## **Internal Medicine (IN\_MED)**

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### **IN\_MED 6002. Internal Medicine Clerkship. 6 Credits.**

Internal Medicine Clerkship.

### **IN\_MED 6012. Rural Internal Medicine Clerkship. 6 Credits.**

Rural Internal Medicine Clerkship.

**IN\_MED 6102. Remediation 6002 Internal Medicine Clerkship. 6 Credits.**

Internal Medicine Clerkship Remediation. Prerequisite: 6002 Internal Medicine Clerkship, received unsatisfactory grade.

**IN\_MED 6261. ABS Medicine Investigation. 5 Credits.**

ABS Medicine Investigation.

**IN\_MED 6263. ABS Internal Medicine Research. 5-10 Credit.**

ABS Internal Medicine Research.

**IN\_MED 6265. ABS IN MED RSCH/REVIEW. 5 Credits.**

ABS in Medicine Research Review.

**IN\_MED 6267. ABS Quality Improvement and Patient Safety. 5 Credits.**

ABS Quality Improvement and Patient Safety.

**IN\_MED 6365. ABS Internal Medicine Research and Review. 5-10 Credit.**

ABS Internal Medicine Research and Review.

**IN\_MED 6450. DERMATOLOGY I. 5 Credits.**

Dermatology I.

**IN\_MED 6500. Cardiology Consultation Service. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: On the inpatient cardiology consultation block, the senior student gains experience in cardiology consultation at either the University Hospital or the Harry S Truman VA Hospital. Through active participation in the consult service the student is provided the opportunity to acquire knowledge of cardiovascular anatomy, physiology, cardiovascular pharmacology, prevention of cardiovascular disease, risk factors for cardiac disease, lipid disorders, chronic coronary artery disease management and its complications, cardiac arrhythmias and conduction abnormalities, hypertension, valvular heart disease, cardiomyopathy, pericardial disease, pulmonary heart disease, peripheral vascular disease, cerebral vascular disease, adult congenital heart disease, and pre- and post-operative assessment of patients with or without cardiac problems. Evaluations: Students will be evaluated using the standard department student elective evaluation form submitted to the Internal Medicine Education Office. Each faculty working with the student will have the opportunity to contribute to the final grade. The final evaluation will be based on student performance on the cardiology consultation service and active participation in the cardiology conferences. Students' skills in performing a history and physical exam, the quality of their presentation, the quality of their knowledge base, the quality of their interactions will constitute the basis of grade assignment. Notes: Objectives will be met by: Student participation in M-F rounds with cardiology faculty and cardiology post-doctoral fellows. Students do not take call during this rotation and there are no required weekend hours. Students will have the opportunity to assist with patients on the cardiology service. Students are assigned patients and are expected to thoroughly review the patient's record (old & new), elicit a pertinent history, perform a physical exam, review pertinent laboratory, radiology and cardiology procedures and to present these findings to the attending cardiologist. Students are expected to follow assigned patients on a daily basis and to participate in the management plan. Students are expected to actively participate in Cardiology conferences from Monday through Friday at 7:30 a.m. On Mondays and Tuesdays interesting EKGs, echoes, graphic material or research efforts are presented. The Wednesday conference is a combined conference with Thoracic Surgery and Cardiology and centers around case presentations. The Thursday conference is Cardiology Grand Rounds where a clinical or

basic science cardiovascular topic is reviewed by the Cardiology faculty or guest faculty. The Friday conference is the Clinical conference in which a case is presented with a review of literature. Students also have the opportunity to learn to interpret EKGs with faculty and fellows after each morning conference held in Diagnostic Cardiology, room 1E-66.

**IN\_MED 6507. Endocrinology/Metabolism. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: The Endocrinology rotation is designed to enable the student to deal with clinical problems in Diabetes endocrinology and metabolism with particular emphasis on the more common problems in an ambulatory setting. During the rotation the student will have the opportunity to see patients with a wide range of endocrine disorders. These patients will be used as the focus for teaching with the emphasis placed on differential diagnosis, pathophysiology, management, and how the disorder affects the patient as a whole. By the end of the rotation the student should be able to evaluate and manage (with supervision) patients with: 1. Diabetes Mellitus 2. Hypoglycemia 3. Thyroid disorders including goiters, thyroid nodules, hyperthyroidism and hypothyroidism 4. Adrenal disorders including adrenal incidentalomas, Cushing and Hyperaldosteronism 5. Pituitary problems including hypopituitarism, conditions due to pituitary hormone excess that including Cushing's disease, acromegaly and prolactinoma. 6. Calcium abnormalities including hyperparathyroidism, hypoparathyroidism, hypercalcemia, hypocalcaemia and osteoporosis. 7. Polycystic ovarian syndrome. Evaluations: The course grade will be based on students' skill in performing a history and physical exam, the quality of the presentation, the quality of their knowledge base and the quality of their interactions. An exit interview will take place on the last day of the block. There is no exam at the end of this rotation. Notes: Students will have an orientation on the first day in room D109. During the elective rotation students will participate in all clinical activities of the division. Clinics: The Endocrine Service has a strong ambulatory curriculum with daily outpatient clinics held in the Cosmopolitan International Diabetes and Endocrinology Center. These clinics provide the student with the opportunity to evaluate patients with a wide variety of endocrine disorders. Students are assigned patients and are expected to thoroughly review the patients' record (old and new), elicit a pertinent history, perform a physical exam, and review pertinent laboratory and radiology testing and to present results to the attending endocrinologist.. If interested, students can get involved in inpatient consultations in conjunction with the fellow on call. The student may evaluate inpatients referred for consultation (UHC, VA hospital and MMMH) and present them to the attending physician during attending rounds. Students will be given interesting articles related to Diabetes Mellitus and Endocrinology to read during the rotation. The student will be given handouts about common Endocrine problems with case discussions. Tuesday afternoon - Students will participate in the following presented by faculty, Fellows and staff: 1) Case Conference 2) Journal Club 3) Research Conference and 4) Endocrine Board Review Recommended Reading and References: Williams Textbook of Endocrinology (up to date) Students are encouraged to do Medline and PubMed searches. Each student can have a 1/2 day per week for independent study.

**IN\_MED 6508. General Internal Medicine Outpatient. 5 Credits.**

General Internal Medicine Outpatient.

**IN\_MED 6509. Internal Medicine Off-Site Elective. 5 Credits.**

Internal Medicine Off-Site Elective.

**IN\_MED 6511. Quality Improvement and Patient Safety. 5 Credits.**

Quality Improvement and Patient Safety.

**IN\_MED 6513. Infectious Diseases. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: The goals of the Infectious Diseases elective will be to: 1. Teach the student how to be an effective consultant. 2. Assist the student in his/her knowledge of disease processes. 3. Help the student improve his/her history taking and physical examination skills. 4. Enhance the student's knowledge regarding the use of antimicrobial agents. 5. Improve the student's understanding of the diagnosis and management of commonly-encountered infectious diseases with attention to the use of the history and readily available laboratory tests. Evaluations: The student will be evaluated predominantly by his/her performance on the consultation service. In addition, at the end of the rotation the student will be given a written examination which will consist of multiple choice questions. The material covered on the examination will be comprehensive and is designed to test general knowledge of infectious diseases. The written exam constitutes approximately 10% of the grade. Notes: The student's major responsibilities during an infectious diseases elective rotation will involve participation in the consultation process. The student's experience will be supplemented by conferences and selected readings. Specific activities include the following: 1. Infectious Diseases Consultation Service The student will have the opportunity to see and evaluate at least one patient per day. Attending rounds will be held 6 days per week. At attending rounds, the student will present his/her patients to the attending physician. At the time of presentation, the student should also have a plan for diagnosis and therapy. The student will see patients in consultation, make daily rounds on his/her patients and be present at the attending physician rounds. He/she will be responsible for a daily update of his/her patients to the attending. 2. Student Lecture Series This 12-lecture series, specifically designed for students, features lecture discussions by faculty and fellows concerning the diagnosis and treatment of common infectious diseases. Topics included in the lecture series are: 1) use of antibiotics (I, II and III); 2) anti-tuberculosis and antifungal; 3) pneumonias; 4) skin/soft tissue infections; 5) sexually transmitted diseases; 6) urinary tract infections; 7) infectious endocarditis; 8) central nervous system infections; 9) acute infectious diarrheas; 10) AIDS. Conferences Case Review Conference During this conference, the consultation service presents cases that have been unusually perplexing or complicated for review by the entire division. Students may be called upon to present cases at this conference. Journal Club This conference consists of a review of recent journal articles pertaining to infectious diseases and is led by faculty and fellows. Didactic Conference The Didactic Conference is an in-depth review of a topic by a faculty or fellow. 4. Student Syllabus The infectious diseases student syllabus is a practical guide to the diagnosis and treatment of common infectious diseases. Written by the infectious diseases faculty, it parallels the student lecture series in scope and content. 5. Reprint File The Division maintains a reprint file of over 4,000 articles on various aspects of infectious diseases. Arranged topically, these reprints have become a popular and easily accessible resource for students rotating on the service.

**IN\_MED 6515. Problems in Medical Ethics. 5 Credits.**

Problems in Medical Ethics.

**IN\_MED 6517. Geriatrics-Internal Medicine Elective. 5 Credits.**

Geriatrics-Internal Medicine Elective.

**IN\_MED 6671. General Medicine - Offsite. 5 Credits.**

This course was established to accommodate fourth year medical students who wish to take an elective at another medical institution. There is no specific maximum number of students who will be permitted to enroll in this course.

**IN\_MED 6700. Cardiology Consultation Services - Rural. 5 Credits.**

Cardiology Consultation Services - Rural.

**IN\_MED 6702. Immunology/Rheumatology - Rural. 5 Credits.**

Immunology/Rheumatology - Rural.

**IN\_MED 6704. General Internal Medicine Outpatient - Rural. 5 Credits.**

General Internal Medicine Outpatient - Rural.

**IN\_MED 6705. Pulmonary Medicine - Rural. 5 Credits.**

Rural Pulmonary Medicine general elective. Prerequisites: Internal Medicine [IN\_MED] 6002. Restricted to fourth year medical student.

**IN\_MED 6707. General Internal Medicine Outpatient - Rural. 5 Credits.**

The 4th year medical student will work with an IM community-based faculty member at a rural training site. Students will see patients in clinic, perform the history and physical examination, and develop an assessment and plan for these patients on their own. They will then discuss with the community-based faculty member and see the patient together. The 4th year student will complete oral presentations and document encounters as directed by the community-based faculty member. Prerequisites: Internal Medicine [IN\_MED] 6002, 4th year medical student. Course may be repeated for credit.

**IN\_MED 6750. DERMATOLOGY 1-RURAL. 5 Credits.**

Dermatology 1 - Rural.

**IN\_MED 6800. Coronary Care Unit. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: During the Coronary Intensive Care Unit rotation, the medical student is provided the opportunity to acquire knowledge in the evaluation and management of acute and chronic coronary artery disease, life threatening cardiac arrhythmias, acute severe congestive heart failure, acute valvular disease, acute infective endocarditis, hypertensive emergencies, cardiac tamponade, aortic dissection, aortic pulmonary embolism, life threatening complications of cardiac therapy, hypotension, and shock. The Coronary Intensive Care rotation allows the student to evaluate and treat these patients in close conjunction with medical residents, cardiology fellows and cardiology faculty. Evaluations: Students will be evaluated using the standard Department student elective evaluation form submitted to the Internal Medicine Education Office. Each faculty working with the student will have the opportunity to contribute to the final grade. The final evaluation will be based on student performance on the cardiology consultation service and active participation in the cardiology conferences. Students' skills in performing a history and physical exam, the quality of their presentation, the quality of their knowledge base, the quality of their interactions will constitute the basis of grade assignment. Notes: The objectives will be met by students functioning as a junior intern with responsibility for performing history, and physical examinations, and making daily assessments of patients in the Coronary Intensive Care Unit and the Cardiology Ward. Students will have the opportunity to assist with patients on the cardiology service. Students are assigned patients and are expected to thoroughly review the patient's record (old & new), elicit a pertinent history, perform a physical exam, review pertinent laboratory, radiology and cardiology procedures and to present these findings to the attending cardiologist. Students are expected to follow assigned patients on a daily basis and to participate in the management plan. Rotations are available at the University Hospital. Students will make daily rounds with residents, fellows, faculty, and nurses. Call is optional. Students are expected to actively participate in Cardiology conferences from Monday through Friday

at 7:30 am. On Mondays and Tuesdays presentations of interesting EKGs, echoes, graphic material or research efforts are presented. The Wednesday conference is a combined conference with Thoracic Surgery and Cardiology with case presentations. The Thursday conference is Cardiology Grand Rounds. A clinical or basic science cardiovascular topic is reviewed by the Cardiology faculty or guest faculty. The Friday conference is the Clinical conference in which a case is presented with a review of the literature. Students have the opportunity to learn to interpret EKGs with faculty and fellows after each morning conference held in Diagnostic Cardiology, room 1E-66.

**IN\_MED 6801. Diabetes Mellitus Externship. 5 Credits.**

Diabetes Mellitus Externship.

**IN\_MED 6802. Gastroenterology. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: Medical students will be assigned to the inpatient GI consultation service, where they will see and evaluate patients, read about their problems, and present them to the GI fellow and/or teaching attending. They should attend all endoscopic procedures on the patients they follow on the inpatient service. They should also attend a sampling of outpatient procedures each week in the Endoscopy Center. As time permits, they may be assigned to one or more GI clinics during the rotation as well. Medical students will be expected to attend all GI conferences during the rotation. These are held on Tuesdays, Wednesdays, and Thursdays, and are detailed on the monthly GI calendar. Students are also encouraged to attend Internal Medicine Grand Rounds and Internal Medicine Morning Report. They may also be assigned to give one formal presentation during their rotation. It is recommended that they read the entire GI-Liver section of the Internal Medicine textbook that they used on their third-year Internal Medicine Clerkship. Evaluations: Ongoing feedback is provided to the student during the rotation. At the end of the rotation, a formal written evaluation will be prepared by the inpatient attending, in conjunction with the GI fellow with whom the resident/medical student worked with. Conference participation is factored in. There is no written or oral examination. Notes: The following are the educational purposes of the rotation: 1. They will gain exposure and acquire experience in the evaluation and management of adult patients with a broad range of acute and chronic GI problems. 2. They will develop an appreciation of standard GI endoscopic procedures, such as how they are done, indications, contraindications, potential findings, limitations, and complications. 3. Medical knowledge is enhanced in a number of ways-- through patient care contacts, by attending teaching rounds, by reading about the problems and conditions their patients have, and through teaching conferences they attend and participate in during the rotation. It is also recommended that the student read the entire GI-liver section of the Internal Medicine textbook that they used on their third-year Internal Medicine rotation. 4. The rotation will provide medical students with exposure to practice-based learning and improvement that involves the investigation and evaluation of care for their patients, the appraisal and assimilation of scientific evidence, and improvement in patient care. The rotation will also provide them with exposure to systems-based practice as manifested by actions that demonstrate an awareness and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. 5. As medical students go about their supervised clinical duties they will develop improved communication skills that result in effective exchange of information and collaboration with patients, their families, and other health professionals. 6. The rotation will provide medical students with the ability to develop competence in professionalism, manifested through a commitment to

carrying out professional responsibilities, adherence to ethical principles, and sensitivity to patients of diverse backgrounds. Teaching Methods-- The principle teaching method is case-based discussions by medical student with the fellow and attending physician on the consult service. Residents and medical students initially evaluate the patient, including performing a history and physical exam, and gathering appropriate laboratory and x-ray data. They should do preliminary educational reading about the case at this point. The case is then presented to the GI fellow and/or attending. The fellow/attending verify key portions of the history and physical exam. The fellow and attending also provides teaching and discussion on pertinent clinical and pathophysiologic aspects of the case. Medical students are also expected to attend various endoscopic procedures, such as EGD, PEG placement, colonoscopy, capsule endoscopy, and ERCP. Teaching on this rotation is also supplemented by conference attendance, conference discussions, and by independent self-learning. Lines of Supervision-- The inpatient service has a designated GI fellow and attending physician who are responsible for the supervision of the medical student. The GI fellow will assign inpatient consults for the medical student to see. Cases will generally first be presented to the GI fellow, and then later to the attending on teaching rounds. Educational Resources to be Used--Medical students are encouraged to read the entire GI-liver sections of the internal medicine textbook they own and use. In addition, GI division libraries contain a number of GI-liver textbooks and other educational resources. The University of Missouri Health Sciences Library contains a vast array of helpful reference books, journals, interlibrary loan services, and the like. Medline searches can be conducted on-line (via the internet) through the Health Sciences Library website. UpToDate Online is available to all medical students, and is a tremendous clinical and educational resource. Met Research and Writing Projects.-- Students interested in performing a research project, writing up a case report, or writing a review article for publication may discuss matters with a faculty member. Generally, this should be done well in advance of when the student wants to do the project. Contact information-- On the first weekday of the rotation, the medical student should report to Sharon Young in room M580 at 8:00 am for their schedule and rotation materials (phone number 882-7758). The student may also contact Dr. John Marshall or Dr. Jamal Ibdah if they have questions.

**IN\_MED 6803. Subinternship in Internal Medicine. 5 Credits.**

Prerequisites: Internal Medicine Clerkship and M4 status. Goals/Objectives: The internal medicine subinternship builds on the skills begun during the internal medicine clerkship and prepares the student for the internship year. 1. Students will refine and further develop skills in: a. Physical exam, history taking, chart review, and written notes; b. Problem list development and management plan; data interpretation and synthesis; c. Oral presentation; d. Interpersonal relations with patients, families, staff and peers ; e. Time management i. Self-directed learning ii. Evidence-based medicine 2. Expand knowledge base in general internal medicine 3. Assume primary responsibility for inpatient care 4. Further develop in the role of primary care giver Evaluations: Patient management skills, medical record keeping, presentation skills, knowledge base, and ability to handle responsibility will be carefully observed by both the senior ward resident and the attending physician. Students will receive constructive feed-back/suggestions for improvement throughout the rotation from both the attending and the senior ward resident. The attending, with input from the senior ward resident and the third year students, will report the final scores using the Department of Internal Medicine standard electives evaluation form. Students will meet with the attending physician at the end of the block to discuss their performance. Students will not receive elective credit for three

weeks rotations. Notes: CLINICAL COMPETENCIES Communication - Interns play a key role in communicating aspects of patient care to patients and healthcare providers, often in diverse clinical situations. Specific learning objectives: Coordination of care - Interns plan a central role in coordinating a patient's care, both during hospitalization and upon transition from the inpatient to outpatient setting. This involves communication between the patient and his/her family, colleagues, consultants, members of the health care team, and other hospital personnel. Appropriate management and coordination is essential to ensure optimal patient care. Specific learning objectives: Information management - The subinternship presents an opportunity for fourth year medical students to gain experience with procedures that are commonly performed by interns and residents. Specific learning objectives CURRICULUM 1. Core Reading: Students should have access to a comprehensive medicine text such as Harrison's or Cecil's and will be required to read on their patients' problems and present their conclusions in a clear and concise manner. Subinterns are encouraged to expand their data base by reading standard text and current journal articles on each of their patient's problems including the inactive problems. Additional topics may be assigned. 2. Conferences: Students will attend house staff morning report and resident noon conferences daily. In addition, faculty and residents will conduct teaching rounds 2-5 times weekly. 3. Training Problems: Students will work through a series of training problems of commonly encountered internal medicine chief complaints involving history taking and physical examination, test interpretation, communication and relationships with colleagues, and therapeutic decision making. Attendings and residents may incorporate these training problem modules in teaching rounds. The training problems are listed below: a. Abdominal Pain b. Acute Gastrointestinal Bleeding c. Acute Pulmonary Edema d. Acute Renal Failure e. Altered Mental Status f. Arrhythmias g. Chest Pain h. Drug Withdrawal i. Electrolyte Disorders j. Fever k. Glycemic Control l. Hypertensive Urgencies and Emergencies m. Nausea and Vomiting n. Pain Management o. Respiratory Distress p. Seizures q. Shock.

**IN\_MED 6804. Geriatrics - Internal Medicine @ VA. 5 Credits.**

Geriatrics - Internal Medicine @ VA.

**IN\_MED 6805. Hematology and Medical Oncology Chronic Care. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: The specific objective of the course is to assist the student in developing a greater understanding for the care of chronically ill patients with hematologic and neoplastic diseases. Evaluations: The student's evaluation is based predominantly on his/her performance in presentation and in written chart notes of patients under the student's care. This evaluation will be by the attending physician with whom the student has worked. The standard department student elective evaluation form will be used to document student performance. Notes: The curriculum in hematology and medical oncology chronic care consists primarily of the inpatient service on the Ellis Fischel Cancer Ward at University Hospital and outpatient experience at the Ellis Fischel Cancer Center. Conferences and an opportunity for independent study in the learning center will supplement the student's educational experience. When feasible, advance arrangements may be made for a student to work predominantly with an attending physician of his/her choice. Students will have the opportunity to assist with the management of patients on the medicine Hematology-Medical Oncology inpatient service. Students are expected to thoroughly review the patient's records (old and new), elicit a pertinent history, perform an appropriate physical exam, assemble pertinent lab data and present these findings to the attending hematologist/oncology.

Following a thorough discussion, a consensus opinion is written and recorded in the patient's chart. The student is expected to read the standard oncology or hematological textbook, and to present their conclusion in a clear and concise manner to the attending.

**IN\_MED 6806. Immunology/Rheumatology. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: Traditional education in medical school is oriented to acute episodic care. However, it should be appreciated that arthritis and musculoskeletal diseases constitute a significant percentage of the total visits to primary care physicians (published estimates range from 8 to 20%). The Immunology and Rheumatology elective provides a unique opportunity for medical students to increase their understanding regarding patients with these diseases. The overall curricular objectives of this elective include: 1. Basic Information. The student should be able to: a. Perform a medical history and screening physical examination with attention to symptoms and signs of rheumatic disease. Understand the basic pathophysiology and clinical diagnosis of common arthritic and musculoskeletal diseases in adults. b. Understand the natural history of rheumatic diseases, particularly rheumatoid arthritis, soft tissue rheumatism, degenerative joint disease, systemic lupus erythematosus and spondyloarthropathies. c. Understand the short and long term management of rheumatic conditions and apply these principles together with overall clinical judgment in the management of individual patients. These therapeutic measures include: 1. drug therapy, 2. physical rehabilitative measures, and 3. surgical intervention. d. Learn the uses and pitfalls of laboratory tests in practice. e. Formulate ways to approach the emotional problems of patients with chronic disease. f. Understand the value of the comprehensive approach in arthritis treatment including patient education, the role of the allied health professional and community resources. 2. Skills. The student should be able to: a. Perform a thorough musculoskeletal examination and be able to correctly interpret the physical findings. b. Identify the following changes on x-rays: i. Joint space narrowing ii. Erosions iii. Osteophytes and syndesmophytes iv. Chondrocalcinosis and other changes associated with crystal-induced arthropathies v. Juxta-articular osteopenia vi. Soft tissue swelling c. The student may get the opportunity to aspirate joints or inject soft tissue. The student should be able to interpret synovial fluid findings 3. Basic Attitudes and Behavior. The student should: a. Develop a positive approach to the patient with arthritis; learn to make specific diagnoses, to use optimal therapy, and to appreciate the necessity of patient education and attending to the emotional needs of the patient with a chronic disease. b. Recognize limitations and utilize consultation with the rheumatologist, orthopedist, psychiatrist, physiatrist, and other specialists as indicated. c. Be able to work with allied health professionals and utilize community resources effectively in managing patients. d. Take an interest in community health programs and in the education of professionals and the public. e. Develop a strong motivation for continuing education. "Evaluations: Personal discussions with faculty will be utilized to provide the student with an indication of progress or deficiencies. Students' skill in performing a history and physical exam, the quality of their knowledge base, and the quality of interactions will constitute the basis of grade assignment. We have a set of goals for teaching by fellows and faculty. Students will be asked to complete an evaluation form to provide us with their assessment of the effectiveness of this program in stimulating their learning in the area of arthritis and musculoskeletal disease. Notes: A four-week curriculum is offered. Specific experiences which will be utilized to pursue the above objectives include: 1. Rheumatology Inpatient and Outpatient Consult Service: a. The student will evaluate patients seen in consultation, present them to the Fellow and Attending physicians, and accompany the Rheumatology Fellow and Attending on

consult rounds in the University Hospital and VA Hospital. b. The student will be instructed in the proper examination of joints with appropriate "hands on" teaching. c. The student will learn the basic treatment for patients with rheumatic diseases. 2. Rheumatology Clinics: The student is expected to attend the UMC Fellows Clinic 2-3 times where he/she evaluates new patients, presents them to the attending, formulates a diagnostic and treatment plan, and follows up that patient as time allows. The student is encouraged to accompany an attending in one of their weekly clinics. 3. Student Didactic Sessions and Conferences: Didactic lectures and focus groups on common and important rheumatological topics will be presented by Immunology/Rheumatology Division members for students and house officers during the block during: a. Specifically appointed didactic sessions b. Rheumatology Grand Rounds c. Didactic Weekly Review Course d. Basic Science - Immunology Update - Journal Club Meeting ie. Rheum Team Conference Topics could include: RA, OA, antiphospholipid antibodies, MCTD, autoantibiotics, scleroderma, SLE, pediatric rheumatology, and psychological aspects of rheumatologic diseases. 4. Conferences include: a. Rheumatology Grand Rounds - (usually at 3:00 pm on Thursdays) features weekly case presentations that illustrate important aspects of adult and pediatric rheumatologic disease. This will also include some didactic sessions on radiology, pathology, physical medicine, and physical therapy. b. Rheumatology Basic Science Immunology Journal Club (Weekly on Thursday at 2:00 pm, see detailed schedule available in I & R Office).patient with rheumatic disease. (Usually monthly, Thursday at 4:00 pm--check detailed schedule available in I&R office). 5. Basic Educational Materials This monthly meeting focuses on the review, by faculty and fellows, of important articles from the Immunology and Rheumatology literature., basic science review, divisional research interests/topics. b. Rheumatology Conference This monthly multi-disciplinary offers the opportunity to observe the interrelationship of the disciplines most critical patient with rheumatic disease. The Primer on Rheumatic Disease, a syllabus on arthritis and rheumatism b. A CD ROM with selected readings, list of objectives, x-ray findings and problem cases c. The American College of Rheumatology (ACR) case curricula, x-ray collections and disease review CDs are made available for review and will be the basis of some specialty didactic sessions. d. CD-ROMs i. CD-ROMs for evaluating basic rheumatologic diseases and pathology, radiology of such diseases. ii. CD-ROM - Case Review (ACR) iii. CD-ROM - Radiology Review (ACR).

#### **IN\_MED 6807. Medical Intensive Care. 5 Credits.**

Prerequisites: Internal Medicine Clerkship; M4 status. Goals/Objectives: 1. Under the supervision of the medical critical care attending, the medical students are part of a team providing assessment, management, and follow-up of critically ill patients. Students will be intimately involved in this multidisciplinary approach to patient care. As a member of the ICU patient management team, the student will work collaboratively with residents, fellows, medical attendings, nurses, pharmacists, respiratory therapists and the nutritional support staff. The team will work in a coordinated fashion with consulting physicians and services, social services, physical therapy workers, and the radiology and pathology laboratory departments, and chaplain services. 2. To become familiar with the basic pathophysiology and management of common diseases encountered in the critical care setting including: a. Multi-organ system dysfunction and acute respiratory distress syndrome (ARDS) b. States of hypoperfusion or shock c. Sepsis and other systemic manifestations of infection and inflammation d. Nosocomial and community acquired infections e. Gastrointestinal hemorrhage and ischemia f. Acute exacerbations of chronic airflow obstruction such as COPD and asthma g. Acute renal failure and means of renal replacement therapy h. Electrolyte abnormalities and acid-base disorders, including diabetic

ketoacidosis and hyperosmolar states i. Neurologic emergencies such as cerebral vascular accidents j. Toxicologic emergencies such as overdoses and poisoning k. Cardiac abnormalities such as pulmonary edema, and acute heart failure l. Acute and acute-on-chronic respiratory failure and mechanical ventilation management (noninvasive and invasive) 3. To gain experience and understanding (including indications, alternatives, and estimation of risks and benefits) of both invasive and noninvasive procedures used to monitor and manage critically ill patients. Common procedures include central venous lines, pulmonary artery catheters (Swan-Ganz catheters), and arterial lines. 4. To gain knowledge of the unique pharmacological agents including vasoactive, inotropic, sedative, analgesic, and neuromuscular blocking agents used in the critical care environment. 5. To understand the principles and gain experience in application of integrated physiology in: a. hemodynamic monitoring and concepts of oxygen delivery and consumption b. assisted ventilation, including principles of oxygenation, ventilation, and cardiopulmonary interactions c. renal replacement therapies d. nutritional assessment and support (enteral and parenteral) e. interpretation of radiographs and use of both invasive and noninvasive radiographic techniques f. application of echocardiography g. endoscopic studies 6. To gain insight and experience with the basic ethical principles such as patient autonomy and concept of futility care. To understand the humanistic aspects of death and dying and the psychosocial needs of patients and their families, as well as the special contribution of members of the health care team including nurses, social service workers, and chaplains. Assume role as a team member in end-of-life care and decision-making. 7. To develop and utilize interpersonal skills to work with and to communicate effectively with all team members, patients, and their families. Leadership skills necessary to direct the overall care of critically ill patients will be developed. 8. To integrate basic sciences, physiology, clinical sciences and bedside management, ethical, and socioeconomic aspects of patient care to allow delivery of comprehensive care to critically ill patients. 9. To gain insight in concepts of goal-directed care, cost effective care and resource utilization. Evaluations: Students are evaluated by their clinical performance during the month. Key aspects include: 1. Clinical knowledge, bedside skills, procedure skills, and admission and daily notes 2. Participation and contribution during rounds 3. Interpersonal skills with patients, family members, and other team members Evaluation is by means of the standard Department of Medicine student evaluation form. The attending and the fellow both contribute to this evaluation. There is no written examination. The final letter grade will be determined by all of the faculty. The course grade will be based on students' skill in performing a history and physical exam, the quality of the presentation, the quality of their knowledge base, and the quality of their interactions. Students will not receive credit for three weeks rotations. Notes: Conferences: Students are expected to attend and participate in the various conferences. (For a current list of conferences, see the monthly calendar in MA419.) Educational Resources: A variety of resources are available during this rotation. Each student will be expected to learn from: a. Attendance and participation in daily work rounds, attending rounds, conferences, didactic lectures, daily note writing and chart review. Students will have the opportunity to assist with patient management in the ICU. Students are assigned patients and are expected to thoroughly review the patients record (old and new), elicit a pertinent history, perform a physical exam, review pertinent laboratory, radiology, and other procedures and to present these findings to the attending and critical care team. Students are expected to follow assigned patients on a daily basis and to participate in the management plan for these patients. b. Experience from direct patient management, collaboration with team members and with consultants. In

addition, pertinent journal articles and standard critical care textbooks and monographs will be made available. Students will be expected to become familiar with the use of computerized literature searches in critical care medicine. While "handbooks," such as those authored by Marino or Marini and Wheeler, may be of benefit, these should be secondary references. c. Experience of patient-focused care and communication with family members and significant others, and surrogate decision makers.

**IN\_MED 6808. Nephrology Advanced Elective. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: This elective builds on the knowledge and skills students have acquired in the third year course in Internal Medicine. Students will have the opportunity to perform histories and physicals, participate in the decision-making process of patient management, and be responsible for daily follow-up in patients with fluid and electrolyte problems, acid-base disturbances, acute and chronic renal failure and a variety of renal diseases. The focus in these areas will be at a much higher level of responsibility and management than in the third-year course. Specific learning objectives: To develop the student's clinical skills in the diagnosis and management of patients with a variety of fluid and electrolyte, acid-based and renal problems in both the inpatient and outpatient settings. To expand the student's knowledge base in fluid and electrolyte disorders, acid-base disturbances, a variety of renal diseases including renal failure. To expand the student's knowledge of the proper use of special renal laboratory tests. To allow the student exposure to the treatment regimens for patients with renal failure and patients pre- and post-renal transplantation. Evaluations: Students will have direct discussions with their attendings about their performance at mid-block and at the conclusion of the block. The Department of Internal Medicine provides an evaluation form which is completed by the attendings with whom the student has worked. Students have the opportunity to review and discuss these evaluation forms. Evaluation is based on the student's skills in performing a history and physical examination, the quality of their presentation, the quality of their knowledge base, the quality of their interactions and input, and their overall interest and industry. Notes: CURRICULUM: Students will be assigned to a team consisting of one attending plus fellows and residents. Students will work up patients independently then review their findings with the team at attending rounds. Special division activities that impact on student education include the following: Nephrology Consultations: Students are assigned patients in which nephrology consultation is requested. The student will make the initial workup of these patients. This will include performing a chart review, physical examination and urinalysis on the patient, and studying any special radiological procedures that may have been performed. The student will be expected to make formal presentations to the attending physician on the consult service and then follow each patient on a daily basis as necessary. Students will participate in the management plan development on their patients. Attending rounds will be held on a daily basis. A variety of formats will be used by the attending physician, but attending rounds will encompass a review of old patients, presentation of new patients, and didactic conferences. Didactic Discussions: Students are expected to attend all conferences and lectures in the division. Students will have didactic sessions with faculty to discuss reading assignments and fluid and electrolyte problem solving. Conference descriptions along with the conference schedules are available in the Nephrology Office. Sample Conference Descriptions: Dialysis & Transplant Evaluation Conference: This conference is every Wednesday starting at 12 noon in the acute dialysis conference room, 4W40. The conference focuses on patients with chronic renal failure and in need of dialysis and or transplantation, who have recently been

evaluated by the nephrology service. Students will be expected to make patient presentations when they are assigned patients that are discussed at this conference. Pathology Conference: This conference is on Wednesday of every week at 12:30 pm, in room MA223. Students will be responsible for presenting patients and assisting with the organization of this conference. Biopsies will be presented when available. If biopsy cases are not available, teaching cases will be discussed. Night and Weekend Call: Students will have the option of being called for nighttime and weekend patient-care opportunities with the Fellow and/or Faculty member on call. Call is optional and not required. Learning Resources: Students will have access to the Nephrology Division Library containing Nephrology texts and journals.

**IN\_MED 6809. Pulmonary Medicine Diagnostic Services. 5 Credits.**

Prerequisites: Internal Medicine Clerkship. Goals/Objectives: The Pulmonary Medicine Service is designed to allow students to participate in the diagnosis and care of hospitalized patients with an acute pulmonary problem as well as continuity follow up of existing known disease processes. This service evaluates and assists in management of adult patients at the University or VA Medical Centers. Either rotation includes intensive care unit patients with primary surgical or cardiac diagnoses, the rotation at the VA Medical Center also includes intensive care unit patients with primary medical diagnoses. The team consists of 1 Attending, 1 Fellow, and student(s). In general, 1-2 internal medicine residents are also team participants. The rotation will introduce the student to major clinical entities including the diagnosis and management of infectious lung disorders, neoplasms of the lungs, chronic obstructive pulmonary disease, asthma, acute respiratory failure, occupational pulmonary disease and interstitial lung disorders. The student will be introduced to the variety of diagnostic tests including radiographic studies, fiberoptic bronchoscopy, pulmonary function testing, cardiopulmonary exercise testing, surgical lung biopsy, thoracentesis and pleural biopsy, and arterial blood sampling. Students also participate in consultation on patients requiring outpatient pulmonary clinic evaluation. Each student is encouraged to spend extra time in the pulmonary function lab, and have pulmonary function tests and cardiopulmonary exercise tests done on themselves, depending on available time. Each student rotating through the pulmonary service will be expected to evaluate and present patients fully on a daily basis to the pulmonary consult team, including the attending physician. The student will have an opportunity to assist fellows and faculty with procedures such as bronchoscopy and thoracentesis. Students will have the opportunity to interpret pulmonary function tests, chest radiographs and other radiographic studies such as computed tomography and nuclear medicine studies of the thorax. 1. Conferences Chest Radiology Conference (1st Tuesday of each month, 12:00 - 1:00 pm in M253). Educational films and diagnostic dilemmas are presented in coordination with Pulmonary and Radiology Attending Faculty and Fellows in a clinically oriented fashion. Lung Pathology Conference (3rd Monday of each month, 12:00 - 1:00 pm in MA223). Common and unusual lung and pleural biopsy specimens of current clinical cases are reviewed in coordination with Pulmonary and Pathology Department Attendings, Residents, and Fellows. Chest/Thoracic Surgery Conference (1st & 3rd Wednesday of each month, 5:00 - 6:00 pm, MA406B). Routine and Challenging cases are openly presented with chest x-rays and CAT scan for a multidisciplinary approach to patient care management. Pulmonary Fellows Seminar (Monday and Wednesday, 12:00 - 1:00 pm in conference room C5005; July through September) . Fellows and faculty members discuss current didactic subjects, research interests, or review state-of-the-art literature in the field of pulmonary, critical care, and environmental medicine. Additional Weekly Conferences are available (See Monthly Calendar



in MA-419). 2. Reading A collection of pertinent articles, monographs and textbooks of pulmonary diseases are available for review. Students are encouraged to perform literature searches on matters of clinical concern on the service. An intensive review of the pulmonary sections of the internal medicine textbook each student has selected as a primary reference is recommended. 3. Ambulatory experience Three MU pulmonary and one weekly VA subspecialty clinic, are available to meet the various needs and interests of the students. Students are expected to participate actively in the VA clinic and in at least one MU pulmonary subspecialty clinic with fellows or faculty on the service. Evaluations: Students are evaluated by their clinical performance during the month rotation. Evaluation is by means of the standard Department of Medicine student evaluation form. The attending and the fellow both contribute to this evaluation. There is no written examination. The course grade will be based on students' skill in performing history and physical exam, the quality of the presentation, the quality of their knowledge base, and the quality of their interaction with patients, other students, residents, and faculty, and the quality of their written notes.

**IN\_MED 6820. General Medicine - Offsite. 5 Credits.**

This course was established to accommodate fourth year medical students who wish to take an elective at another medical institution. There is no specific maximum number of students who will be permitted to enroll in this course.

**IN\_MED 6821. Internal Medicine Off-Site Selective. 5 Credits.**

Internal Medicine Off-Site Selective.

**IN\_MED 6850. DERMATOLOGY 2. 5 Credits.**

DERMATOLOGY 2.

## International Studies (INTL\_S)

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**INTL\_S 2940. Capstone Internship in International Studies. 1-6 Credit.**

Internship limited to students pursuing the AB in International Studies Degree. Graded on S/U basis only. May be repeated to a maximum of six hours.

**INTL\_S 2960. Capstone Readings in International Studies. 1-6 Credit.**

Independent readings with supervisory faculty member. Open only to international studies majors. May be repeated up to a maximum of 6 hours.

**INTL\_S 4290. Pre-Departure Seminar for the TaLK Program. 3 Credits.**

Prior to beginning the TaLK Program in Korea, students will explore Korean language, culture and educational system through seminars and workshops provided by the Asian Affairs Staff and guest speakers. Course is by instructor consent only. Graded A-F only.

**INTL\_S 4940. Internship in International Studies. 1-6 Credit.**

Internship limited to students pursuing the AB in International Studies degree. Graded on S/U basis only. May be repeated to a maximum of six hours.

**INTL\_S 4960. Readings in International Studies. 1-6 Credit.**

Independent readings with supervisory faculty member. Open only to International Studies majors. May be repeated up to a maximum of 6 hours.

**INTL\_S 4970. Special Readings in International Studies. 1-6 Credit.**

Independent readings with supervisory faculty member; this course serves as the students' capstone experience. Open only to International studies majors.

**INTL\_S 4971. Capstone Internship in International Studies. 1-6 Credit.**

Internship experience which serves as the student's capstone experience. Program advisor must approve internships. Graded on S/U basis only. Section 2 of this course will be designated for Service Learning Capstone experience.

## Italian (ITAL)

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**ITAL 1100. Elementary Italian I. 5-6 Credit.**

Intensive approach to beginning language. Designed to give students an overview of the grammar and syntax of Italian. Emphasis is on oral, with some reading and writing. The 5-hour option is open ONLY to Bachelor of Music students and only with override from the Department. The 5-hour option cannot be applied to meet A&S or Journalism foreign language requirements.

**ITAL 1200. Elementary Italian II. 5-6 Credit.**

Continues basic grammar and syntax of Italian . Emphasis is on oral, with some reading and writing. The 5-hour option is open ONLY to Bachelor of Music students and only with override from the Department. The 5-hour option cannot be applied to meet A&S or Journalism foreign language requirements. Prerequisite: grade of C- or better in Italian [ITAL] 1100 or its equivalent.

**ITAL 1200H. Elementary Italian II - Honors. 5-6 Credit.**

Continues basic grammar and syntax of Italian . Emphasis is on oral, with some reading and writing. The 5-hour option is open ONLY to Bachelor of Music students and only with override from the Department. The 5-hour option cannot be applied to meet A&S or Journalism foreign language requirements. Prerequisite: grade of C- or better in Italian [ITAL] 1100 or its equivalent. Honors eligibility required.

**ITAL 2001. Undergraduate Topics in Italian-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. Prerequisite: departmental consent for repetition.

**ITAL 2004. Undergraduate Topics in Italian-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. Prerequisite: departmental consent for repetition.

**ITAL 2005. Undergraduate Topics in Italian-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. Prerequisite: departmental consent for repetition.

**ITAL 2160. Intermediate Composition and Conversation. 3 Credits.**

Reviews main grammar components of Italian. Emphasis is on acquiring the communicative and compositional skills required to study and discuss Italian literature. Prerequisite: Italian [ITAL] 1200.

**ITAL 2310. Italian Civilization. 3 Credits.**

Open to any student interested. No knowledge of Italian required. Prerequisite: sophomore standing.

**ITAL 2850. Italian Cinema. 3 Credits.**

(same as Film Studies [FILM\_S] 2850). A course which concentrates on the development of Italian Cinema, primarily since the Post-WWII

era, and the ways in which it reflects major economic, social and political events occurring in Italy. No knowledge of Italian required. Prerequisite: sophomore standing.

**ITAL 3001. Topics in Italian-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition. No knowledge of Italian required.

**ITAL 3005. Topics in Italian-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition. No knowledge of Italian required.

**ITAL 3150. Advanced Italian Conversation. 3 Credits.**

This course will develop the student's ability to speak and understand the oral expression of Italian. Focus will be on learning new idiomatic expressions and an acquisition of new vocabulary. Prerequisite: Italian [ITAL] 2160.

**ITAL 3160. Advanced Italian Composition. 3 Credits.**

An advanced grammar course that endeavors to a) develop writing skills in connection with a variety of text types; b) refine study skills; and c) improve style through the study of contemporary Italian culture. Prerequisite: Italian [ITAL] 2160.

**ITAL 3310. 20th Century Italian Fiction in Translation. 3 Credits.**

This course is designed to present American students with a selection of Italian novels aimed at introducing them to some key issues in the historical, social, and literary developments of Italian life from the turn of the century to the 1960s. Prerequisite: sophomore standing or English [ENGLISH] 1000.

**ITAL 3420. Introduction to Italian Literature. 3 Credits.**

This course introduces students to the literacy terminology that will enable them to study Italian literature. Prerequisite: Italian [ITAL] 2310 recommended; basic reading knowledge of a Romance Language is also recommended.

**ITAL 3430. Survey of Italian Literature. 3 Credits.**

Designed to expose students to the rich variety of Italian letters. Emphasis will be placed on textual analysis as well as on authors, themes and stylistic features. Prerequisite: Italian [ITAL] 2310 recommended; basic reading knowledge of a Romance Language is also recommended.

**ITAL 3820. Films of Federico Fellini. 3 Credits.**

(same as Film Studies [FILM\_S] 3820). In studying the filmic career of one of the supreme stylists of the cinematic world, students will view films from each phase of Fellini's career. Prerequisite: Italian [ITAL] 2850 or English [ENGLISH] 1810 or 1820; instructor's consent.

**ITAL 4070. Intensive Beginning Italian. 3 Credits.**

Designed for rapid acquisition of a reading knowledge of Italian. Cannot be taken to fulfill undergraduate language requirement. Prerequisites: instructor's consent.

**ITAL 4960. Special Readings in Italian. 1-3 Credit.**

Independent study through readings, conferences, reports.

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## Japanese (JAPNSE)

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**JAPNSE 1100. Elementary Japanese I. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly.

**JAPNSE 1200. Elementary Japanese II. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly. Prerequisite: C- or better in JAPNSE 1100, or equivalent.

**JAPNSE 2001. Topics in Japanese-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester.

**JAPNSE 2005. Topics in Japanese - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. No knowledge of Japanese required. No language credit.

**JAPNSE 2160. Japanese Conversation and Composition. 3 Credits.**

Prerequisite: C- or better in Japanese [JAPNSE] 1200, or equivalent.

**JAPNSE 2310. Japanese Civilization I. 3 Credits.**

Survey of Japanese culture and arts before 1868. May be taken independently of Japanese [JAPNSE] 2320. No knowledge of Japanese required. No foreign language credit.

**JAPNSE 2320. Japanese Civilization II. 3 Credits.**

Survey of Japanese culture and arts after 1868. May be taken independently of Japanese [JAPNSE] 2310. No knowledge of Japanese required. No foreign language credit.

**JAPNSE 2330. The World of Japanese Business. 3 Credits.**

Designed to assist the student to achieve successful business contacts with Japanese counterparts by understanding the characteristics of Japanese business in cultural, economical, and practical contexts and by learning useful Japanese terms and expressions in business. Prerequisite: sophomore standing.

**JAPNSE 3085. Problems in Japanese. 1-3 Credit.**

Supervised study in Japanese language and/or culture. Prerequisite: instructor's consent.

**JAPNSE 3160. Intermediate Japanese Composition and Conversation. 3 Credits.**

Further develops oral command of Japanese as well as listening comprehension and further essay writing skills. Prerequisite: C- or better in Japanese [JAPNSE] 2160.

**JAPNSE 3320. Classical Japanese Literature (in translation). 3 Credits.**

This course studies Classical Japanese Literature preceded by a brief historical survey of Japanese literature. Analyzes such works as "The Tale of Genji", "Essays in Idleness", "The Pillow Book", "Hojoki" and NO drama. Readings and lectures in English. Prerequisite: sophomore standing.

**JAPNSE 3360. Modern Japanese Literature (in Translation). 3 Credits.**

Surveys Japanese literature from 1868 to present. Analyzes works by such authors as Soseki, Tanizaki, Kawabata, Mishima, Oe, Murakami, and others. Readings and lectures in English. Prerequisite: sophomore standing.

**JAPNSE 3370. Intermediate Readings in Japanese. 3 Credits.**

Develops reading and speaking skills and acquisition of more Kanji, vocabulary, and complex structures. Prerequisite: C- or better in Japanese [JAPNSE] 3160, or equivalent, or instructor's consent.

**JAPNSE 3380. Intermediate Japanese II. 3 Credits.**

Continues development of intermediate reading, listening, speaking, and writing skills achieved in Japanese [JAPNSE] 3370, with attention to vocabulary acquisition, expansion of knowledge of kanji, and

understanding of complex grammatical structures. Authentic readings in Japanese literature and exercises using authentic multi-media materials also help students gain greater familiarity with Japanese culture. Encourages development of student autonomy in language learning with the introduction and use of appropriate reference materials. Prerequisite: Japanese [JAPNSE] 3370.

**JAPNSE 3850. Traditional Japanese Theatre. 3 Credits.**

Study of the history, scripts, and performance techniques of Japanese theatre from 14th century through late 19th century. Examines major plays (in English translations) and the culture that created them. Looks at staging and performance techniques of traditional puppet theatre. Course included stage performances and performances on campus and/or in the community. Prerequisite: Sophomore standing or consent of instructor.

**JAPNSE 3880. Japan and its Cinema. 3 Credits.**

Survey and analysis of selected Japanese films from the 1940s to present. Films will be viewed and discussed in terms of history, techniques, artistry, and social impact. English subtitles. No foreign language credit. Prerequisite: sophomore standing or instructor's consent.

**JAPNSE 4005. Topics in Japanese - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Suitable for students who have taken Japanese [JAPNSE] 3370 or equivalent. Prerequisites: instructor's consent, sophomore standing.

**JAPNSE 4160. Advanced Japanese I. 3 Credits.**

Continues development of reading, listening, speaking, writing skills, with attention to vocabulary acquisition, expansion of knowledge of kanji, and understanding of complex grammatical structures. Authentic readings in Japanese literature, exercises using authentic multi-media materials. Encourages development of student autonomy in language learning with introduction and use of appropriate reference materials. Prerequisites: Japanese [JAPNSE] 3380 or equivalent, or instructor's consent.

**JAPNSE 4180. Advanced Japanese II. 3 Credits.**

This course continues the development of reading, listening, speaking, and writing skills, with attention to vocabulary acquisition, expansion of knowledge of kanji, and understanding of complex grammatical structures. Authentic readings in Japanese literature and exercises using authentic multimedia materials also help students gain greater familiarity with Japanese culture. The course encourages the development of student autonomy in language learning with the introduction and use of appropriate reference materials. Prerequisite: Japanese [JAPNSE] 4160.

## Journalism (JOURN)

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**JOURN \_0900. News Practicum. 3 Credits.**

Instruction in fundamentals of newswriting for students entering the graduate program without an undergraduate degree in journalism.

**JOURN 1000. The News Media: Journalism and Advertising in a Democratic Society. 3 Credits.**

This course surveys the fields of journalism and advertising and discusses their role in a democratic society.

**JOURN 1010. Career Explorations in Journalism. 1 Credit.**

Colloquium in which experts discuss their specialties and answer students' questions on the nature and current status of their disciplines. Open primarily to freshmen. Graded on S/U basis only.

**JOURN 1010H. Career Explorations in Journalism - Honors. 1 Credit.**

Colloquium in which experts discuss their specialties and answer students' questions on the nature and current status of their disciplines. Open primarily to freshmen. Graded on S/U basis only. Honors eligibility required.

**JOURN 1100. Principles of American Journalism. 3 Credits.**

Course designed to acquaint students with concepts and functions of journalism in American society. Stresses the basic issues and problems facing journalists and the mass media. Prerequisites: Restricted to first-time college students with a high school core GPA of 3.0 or higher and 15 college credits (dual, AP, IB or other), or current students with 15 completed credits and UM GPA of 2.75. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism students only.

**JOURN 1940. Pre-Sequence Internship. 0-1 Credit.**

Internship for Journalism students who have not yet entered their emphasis areas. Used to satisfy employer requirements. Prerequisite: journalism students only; instructor's consent required. Graded on S/U basis only.

**JOURN 2000. Cross-Cultural Journalism. 3 Credits.**

Cross-Cultural Journalism provides journalistic tools for the coverage of diverse ethnic, gender, ability and ideological groups inside and outside the United States. The critical role of diverse voices in a democracy will be discussed. Prerequisites: sophomore standing required; Journalism [JOURN] 1100 and UM GPA of 2.8. Should be taken concurrently with JOURN 2100 or 2150. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism Students Only.

**JOURN 2100. News. 3 Credits.**

Introduction to fundamentals of news writing. Lectures, discussions and laboratory work provide training under deadline pressure in writing basic news stories. Stories cover several "live" assignments. Prerequisite: sophomore standing; English [ENGLSH] 1000 with "B-" grade or higher, Journalism [JOURN] 1100 and 2.8 UM GPA. Should be taken concurrently with Journalism [JOURN] 2000. May not be taken concurrently with Journalism [JOURN] 2150. Restricted to Pre-Journalism, Journalism, and Science and Agricultural Journalism students only.

**JOURN 2100H. News. 3 Credits.**

Introduction to fundamentals of news writing. Lectures, discussions and laboratory work provide training under deadline pressure in writing basic news stories. Stories cover several "live" assignments. Prerequisite: sophomore standing, English [ENGLSH] 1000 with "B-" grade or higher, Journalism [JOURN] 1100 and 2.8 UM GPA. Should be taken concurrently with Journalism [JOURN] 2000. May NOT be taken concurrently with [JOURN] 2150. Restricted to Honors-eligible Pre-Journalism, Journalism and Science and Agricultural Journalism students only.

**JOURN 2150. Fundamentals of Multimedia Journalism. 3 Credits.**

This course deals with the challenges faced by journalists and other communicators working with still photos, audio, video and print. Students learn the basics and ethics of cross-platform, multimedia storytelling. Prerequisites: sophomore standing and a UM GPA of 2.8. May not be taken concurrently with Journalism [JOURN] 2100. Restricted to Pre-Journalism, Journalism and Science and Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 3000. History of American Journalism. 3 Credits.**

American mass media from colonial days to present in the context of social, economic and political change.

**JOURN 3510. Think Global: Fundamentals of Globalization and Digital Technologies. 3 Credits.**

(same as GERMAN 3510). This inter-departmental course serves as the introductory seminar for students pursuing the certificate of Digital Global Studies. The course focuses on the impact of technological change and globalization on cultures around the world from various interdisciplinary perspectives. Prerequisite: JOURN 1100 and a 2.75 GPA or instructor's consent.

**JOURN 3510H. Think Global: Fundamentals of Globalization and Digital Technologies - Honors. 3 Credits.**

(same as GERMAN 3510H). This inter-departmental course serves as the introductory seminar for students pursuing the certificate of Digital Global Studies. The course focuses on the impact of technological change and globalization on cultures around the world from various interdisciplinary perspectives. Prerequisites: Sophomore standing or instructor's consent required. Honors eligibility required.

**JOURN 4000. Communications Law. 3 Credits.**

Legal concepts, including prior restraint, libel, privacy, obscenity, contempt and access as they relate to print, broadcast, advertising and other areas.

**JOURN 4050. Communications Practice. 1-3 Credit.**

Special instruction in the school's media as an extension of existing advanced media courses, or, in advertising, an extension of advertising creative courses. Contract must be approved by instructor and dean. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior standing required.

**JOURN 4056. Intersession Colloquium. 1 Credit.**

Lecture portion of any course the student plans to take later during an intersession. Prerequisite: Dean's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4058. New York Program: Journalism Theory and Practice. 2-3 Credit.**

Interdisciplinary course offering on-site study at national media venues in New York. Journalism alumni working in Manhattan provide weekly discussions on contemporary practices, job networks and work experiences. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior standing required.

**JOURN 4116. Managing and Leading People. 1 Credit.**

Dramatic changes in technology and in the media's role in covering technologies requires new management and leadership techniques and paradigms based on new management theories. Students will write case studies examining these changes and applying these new theories. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior standing required.

**JOURN 4120. New Media Basics. 1 Credit.**

Students will learn how to use the Internet to communicate with others, find human and electronic sources for stories and publish on the World Wide Web. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior standing required.

**JOURN 4122. Fundamentals of Data Reporting. 1 Credit.**

Explores the importance to journalists of mining public records and data; reviews basic newsroom mathematics; teaches basic techniques for using Microsoft Excel to create and manipulate spreadsheets and to produce graphics. Prerequisite: Journalism [JOURN] 2100. This course is not to be taken by students who have already completed [JOURN]

4430/7430. Restricted to Journalism and Science and Agricultural Journalism Students only. Graded on A/F basis only.

**JOURN 4126. Digital Audio and Visual Basics for Journalists. 1 Credit.**

Introduces journalism students to audio and video tools used in converged environments. Students will create news stories, ads or promos to meet journalistic or strategic communication goals. Restricted to Journalism and Agricultural Journalism majors only.

**JOURN 4130. Account Services. 1 Credit.**

Designed for advanced strategic communication students preparing for careers in account services. Section topics vary. Restricted to Strategic Communications students only.

**JOURN 4136. Creative Techniques. 1 Credit.**

Designed for advanced strategic communication students preparing for careers in creative work. Section topics vary. Restricted to Strategic Communications students only.

**JOURN 4138. Public Relations Techniques. 1 Credit.**

Designed for advanced strategic communication students preparing for careers in public relations. Section topics vary. Restricted to Strategic Communications students only.

**JOURN 4140. Interactive Techniques. 1 Credit.**

Designed for advanced strategic communications students preparing for careers in interactive media. Section topics may vary. Restricted to Strategic Communications students only.

**JOURN 4146. Strategic Communication Techniques. 1 Credit.**

Designed for advanced strategic communication students. Section topics vary. Restricted to Strategic Communications students only.

**JOURN 4148. Interviewing Essentials. 1 Credit.**

This class allows students to focus on the journalistic interviewing process, from spot news interviews to the sort of interviews required for personality, sports and in-depth work.

**JOURN 4150. Using Infographics. 1 Credit.**

An introduction to the various types of information graphics and how each can be used effectively to help explain the news. Additional emphasis on generating graphic ideas and on the specific challenges of gathering information for graphics. Prerequisites: instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4152. Concepts in Participatory Journalism. 1 Credit.**

Journalists need to know how to be in conversation with their communities rather than lecture to them. In this course, we will look at how a collaborative culture is changing journalism, and how journalists can take advantage of the new landscape. Prerequisite: Journalism [JOURN] 2100, 2150. Graded on A/F basis only.

**JOURN 4198. Area Seminar. 3 Credits.**

Special lectures, readings, discussions relating to the urban journalism, state government reporting or local public affairs reporting programs. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4200. Principles of Strategic Communication. 3 Credits.**

Foundation course familiarizing students with an array of strategic communication tools and how they are used in the field. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior standing required.

**JOURN 4204. Introduction to Strategic Writing and Design. 3 Credits.**

This course will teach you about strategic writing and design, and then show you how to apply these skills to key communication platforms such as digital media, TV, radio, social media and others. Along the way, you will learn to think, write and design creatively and strategically. Prerequisite: junior standing; restricted to Journalism Strategic Communication and Science and Agricultural Journalism Majors only. Graded on A/F basis only.

**JOURN 4206. Strategic Writing I. 3 Credits.**

Students learn strategic writing for a variety of media such as print, radio, television, outdoor, new media, news releases, pitch letters and other persuasive messages. Prerequisites: Journalism [JOURN] 4200, 4226, 4952. Restricted to Strategic Communications students only.

**JOURN 4208. Strategic Writing II. 3 Credits.**

Advanced course in the creation of advertising and public relations materials with an emphasis on strategic planning, developing creative concepts, producing and polishing copy and visuals, execution of finished product and refining. Prerequisite: Journalism [JOURN] 4206. Restricted to Strategic Communications students only.

**JOURN 4212. Sports and Entertainment Promotion. 3 Credits.**

Course focuses on the role that research, sponsorship, advertising, public relations, social media, positioning, target marketing, psychographics, and other strategic communication processes play the promotion of the sports and entertainment industry. The course will critically analyze and examine how chief executive officers of sport and entertainment organizations choose, maintain, or redirect their promotion strategies and activities to help achieve organization missions, encourage tickets sales, and attract large audiences.

**JOURN 4216. Media Sales. 3 Credits.**

Focus of this course is to familiarize students with how to sell a variety of media, including newspaper, radio, television, outdoor, new media, and others. Prerequisites: Journalism [JOURN] 4206. Restricted to Strategic Communications students only.

**JOURN 4218. MoJo Advertising Staff. 3 Credits.**

Application of strategic communication skills in a professional services agency specializing in the youth and young adult segment. Positions include management, planning, creative media and research. Other electives required based on position. Application required. Prerequisites: Journalism [JOURN] 4206 or 7206. Restricted to Strategic Communications students only.

**JOURN 4220. Creative Portfolio. 3 Credits.**

Students will produce a free-standing collection of outstanding, polished creative work to demonstrate his/her ability to perform at a high level of creativity. Prerequisites: core courses and Journalism [JOURN] 4208. Restricted to Strategic Communications students only.

**JOURN 4226. Strategic Design and Visuals I. 3 Credits.**

Course gives students a foundation in visual communication in areas such as typography, balance, eye flow and layouts. Prerequisite: junior standing. Restricted to Strategic Communications students only.

**JOURN 4226H. Strategic Design and Visuals I - Honors. 3 Credits.**

Course gives students a foundation in visual communication in areas such as typography, balance, eye flow and layouts. Restricted to Strategic Communication students only with junior standing or higher. Honors eligibility required.

**JOURN 4228. Strategic Design and Visuals II. 3 Credits.**

Advanced course in strategic design and visuals. Persuasive visual principles applied to variety of integrated media including print, broadcast and on-line. Prerequisite: Journalism [JOURN] 4206. Restricted to Strategic Communication students only.

**JOURN 4236. Psychology in Advertising. 3 Credits.**

Application of psychological principles, learning, perception, motivation, attitudes to advertising. Emphasis on the increasing use of psychographics (the "lifestyle" factor) to understand consumer wants and buying behavior. Prerequisite: Journalism [JOURN] 4200, 4952, 4226.

**JOURN 4238. Broadcast Advertising. 3 Credits.**

Broadcast advertising production. Emphasis on equipment, directing, script/storyboard preparation and commercial analysis. Students become familiar with procedures, techniques and facilities used in basic radio and television production. Prerequisites: Journalism [JOURN] 4206. Restricted to Strategic Communications students only.

**JOURN 4240. Direct and Mail Order Advertising. 2 Credits.**

Direct mail advertising and mail order promotion, retail and national; mailing lists, copy, production, postal regulations, strategy. Prerequisite: Journalism [JOURN] 4206. Restricted to Strategic Communications students only.

**JOURN 4248. Media Strategy and Planning. 3 Credits.**

Course deals with strategic planning and the selection and evaluation of appropriate media outlets. Students gain a clear understanding of the problems and issues involved in crafting effective media strategies, creative problem solving and selection of appropriate media. Prerequisite: Journalism [JOURN] 4200, 4952, 4226. Restricted to Strategic Communications students only.

**JOURN 4250. Management of Strategic Communication. 3 Credits.**

How to lead and contribute to strategically sound, highly creative and seamlessly integrated strategic communication on the agency or client side of the business. Directly relevant to agency account management and account planning, as well as client career paths. Prerequisites: Journalism [JOURN] 4200/7200, 4226/7226 and 4952/7952. Restricted to Strategic Communications students only.

**JOURN 4256. Public Relations. 3 Credits.**

Current methods of communicating with constituents as practiced by agencies, corporations and government/not-for profit organizations. Prerequisite: Journalism [JOURN] 4200. Restricted to Journalism Strategic Communication and Science and Agricultural Journalism students only.

**JOURN 4258. Global Communication. 3 Credits.**

Understanding global communication systems with an emphasis on planning and executing strategic communication campaigns. Particular attention will be paid to cultural, political and economic differences as they affect marketing and development communication. Prerequisites: Journalism [JOURN] 4200, 4226, 4952. Restricted to Strategic Communications students only.

**JOURN 4262. Interactive Advertising I. 3 Credits.**

Course covers every step from integrating Internet efforts into the overall strategic communication plan to building a website that works. Designed for those with an interest in interactive advertising. Prerequisite: Journalism [JOURN] 4200, 4226 and 4952. Graded on A/F basis only. Restricted to Strategic Communication students only.

**JOURN 4263. Interactive Advertising II. 3 Credits.**

Course goes in-depth on top issues in the interactive process from video advertising to social networking sites and how to increase campaign performance with web analytics. Designed for those who want a career in interactive advertising. Prerequisite: Journalism [JOURN] 4262. Restricted to Journalism Strategic Communication students only. Graded on A/F basis only.

**JOURN 4268. Strategic Communication Practicum. 3 Credits.**

Practical experience in public relations, corporate communications and strategic planning with the Missouri School of Journalism serving as client. Students from all journalism disciplines will apply knowledge and skills on a variety of platforms. Prerequisite: Journalism [JOURN] 4206 for Advertising students, JOURN 4306 for Broadcast students, JOURN 4450 for News-Editorial and Magazine students, JOURN 4556 for Photojournalism students. Restricted to Strategic Communication students only.

**JOURN 4270. Public Relations Writing. 3 Credits.**

Develop skills and capabilities in strategic communication applications, including news releases, media advisories, pitch letters, video news releases, media relations techniques, writing for electronic and broadcast media, feature writing, brochures and speeches. Prerequisites: Journalism [JOURN] 4206 and 4256. Graded on A/F basis. Restricted to Strategic Communication students only.

**JOURN 4300. Broadcast News I. 3 Credits.**

Beginning reporting and news writing for radio, television and their on-line services. Introduction to use of audio and video recorders and editing systems in production of news stories. Consideration of ethical issues, economic factors, relationships with news sources and gender and ethnic diversity in the newsroom and in news stories. Prerequisite: Journalism [JOURN] 2100.

**JOURN 4301. Topics in Journalism. 1-3 Credit.**

Selected current topics in journalism. Specific topics to be announced at time of registration.

**JOURN 4306. Broadcast News II. 3 Credits.**

Introduction to general assignment reporting skills for the newsroom environment. Instruction in time management, writing, storytelling and performance. Team skills and ethnic diversity in the newsroom are discussed. Students begin work for broadcast newsrooms. Prerequisite: Journalism [JOURN] 4300.

**JOURN 4308. Broadcast News III. 3 Credits.**

Intermediate reporting and news writing skills for radio and television. Advanced techniques in the use of video and sound in production of news stories. Prerequisite: Journalism [JOURN] 4306.

**JOURN 4310. News Producing. 3 Credits.**

Instruction in techniques of television newscast preparation. Emphasis on role of the television news producer. Prerequisite: Journalism [JOURN] 4308.

**JOURN 4320. Advanced Broadcast Reporting. 3 Credits.**

In-depth reporting and editing for radio or television; advanced production techniques; emphasis on writing, interviewing, effective use of audio or videotape at KOMU-TV or KBIA. Prerequisites: Journalism [JOURN] 4308.

**JOURN 4328. Advanced News Communication. 1 Credit.**

This course will examine and practice the components of effective interviewing and on-set and live reporting for television news. Students

will anchor KOMU-TV's morning newscasts. Prerequisite: graduate standing and Journalism [JOURN] 4306.

**JOURN 4330. From Murrow to Moore: What Good Journalists Read. 3 Credits.**

Introduces undergraduates to seminal works in broadcast and print Journalism that influences contemporary professional practices. Prerequisite: junior standing or instructor's consent. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior Standing required.

**JOURN 4350. Problems in Journalism. 1-3 Credit.**

Independent research arranged with individual faculty member. Contract must be approved by instructor and dean. Not accepted as a substitute for any regularly scheduled course. Some sections of the course may be offered on either A/F graded or S/U graded basis only. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior Standing required.

**JOURN 4400. Introduction to News Editing. 2 Credits.**

Introduces the fundamentals of editing stories and writing headlines for publication online and in print, including an emphasis on style and grammar. Emphasized editing for an online audience. Prerequisite: Journalism [JOURN] 2100.

**JOURN 4406. News Editing. 3 Credits.**

Laboratory work on the Columbia Missourian plus lectures on ethics, page design and news decision making. Prerequisite: Journalism [JOURN] 4400.

**JOURN 4408. Magazine Editing. 3 Credits.**

Review of grammar, punctuation, style rules: measuring articles, copy fitting; writing captions, titles; editing, proofreading, condensing, rewriting magazine articles. Prerequisites: Journalism [JOURN] 4450/7450. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4410. Intermediate Writing. 3 Credits.**

In-depth research and writing techniques. Students produce articles for the Missouriian and school-produced magazines or other publications. Prerequisites: Journalism [JOURN] 4450 or equivalent and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4412. Lifestyle Journalism. 3 Credits.**

In-depth research and writing techniques focused on lifestyle journalism. Students produce articles for the Missouriian and school-produced magazines or other publications. Prerequisites: Journalism [JOURN] 4450 or equivalent and instructor's consent. Substitutes for JOURN 4410. Restricted to Journalism and Science and Agricultural Journalism majors only. Graded on A/F basis only.

**JOURN 4414. Field Reporting on the Food System and Environment. 3 Credits.**

[same as Science and Agricultural Journalism [SCI\_AG\_J] 4414). Field reporting on the social, political, scientific, economic and ethical dimensions of the food system and environment, with emphasis on explanatory story-telling. Includes multi-day field trip. Prerequisite: instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only. Graded on A/F basis only.

**JOURN 4415. Current Issues in Science Journalism. 3 Credits.**

(Same as Science and Agricultural Journalism [SCI\_AG\_J] 4415). Focuses on covering the interplay of one or more current issues of concern to journalists, scientists and society. The focus for any given

semester may be biotechnology, climate change, energy, food safety, global population growth, wildlife or another issue. Prerequisites: Journalism [JOURN] 2100 or instructor's consent. Graded on A/F basis only.

**JOURN 4416. Science, Health and Environmental Writing. 3 Credits.**

Advanced course in the reporting of science, health and environment. Write for publication. Prerequisite: Journalism [JOURN] 4450 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4418. Critical Reviewing. 3 Credits.**

A combination of theory and practice that covers the philosophy and craft of reviewing the arts, including books, movies, television, dance, painting, sculpture and architecture. Students must attempt to publish reviews and essays locally, regionally and nationally. Reviews published in VOX Magazine. Prerequisites: Journalism [JOURN] 0900 or 2100 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4420. Editorial Writing. 3 Credits.**

Emphasizes writing and thinking. Discussion of current problems. Correct and effective use of English language. Mission, obligations and history of editorial pages. Prerequisite: Journalism [JOURN] 4450. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4422. Sports Journalism. 3 Credits.**

A review of everything from "How to Watch Sports" to the history of sports writing. Prerequisites: Journalism [JOURN] 4450/7450 or 4804/7804 or 4306/7306. Restricted to Journalism and Science and Agricultural Journalism students only. Course graded on A/F basis only.

**JOURN 4426. Religion Reporting and Writing. 3 Credits.**

(same as Religious Studies [REL\_ST] 4418). Advanced seminar in religion reporting and writing. Examines the role of religion journalism in faith, public life and culture. Prerequisite: Journalism [JOURN] 4450 or its equivalent in professional writing experience and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4428. Health Reporting Skills. 2-3 Credit.**

This course focuses on research and analysis techniques journalists use to understand and report on health policy, health-care quality, medical research and the business of health care. Prerequisites: Journalism [JOURN] 4450, 4306 or 4804. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4430. Computer-Assisted Reporting. 3 Credits.**

How to negotiate for, transfer and process electronic information; the unique opportunities computers provide for analyzing information. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4436. Investigative Reporting. 3 Credits.**

Advanced course designed to acquaint reporters with public issues. Students write two in-depth projects and other shorter assignments. Students meet weekly with instructor for editorial suggestions. Prerequisites: Journalism [JOURN] 4450 and instructor's consent.

**JOURN 4438. Business and Economics Reporting. 3 Credits.**

Advanced reporting course concentrating on writing and reporting about business and the economy. Emphasis on sources, records, documents and writing techniques. Prerequisites: Journalism [JOURN] 4408 and 4410 or 4506. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4440. Mapping for Stories and Graphics. 2 Credits.**

Learn mapping software to discover information for news stories and lay the foundation for compelling news information graphics. Students will learn how to create maps for print, broadcast and online. Prerequisites: Journalism [JOURN] 2100 and instructor's consent. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4450. News Reporting. 3 Credits.**

Assignments on a daily city newspaper covering community news, city, county and state affairs, sports and lifestyle issues. Experience in gathering and writing news, writing under deadline conditions. Prerequisites: Journalism [JOURN] 2100.

**JOURN 4460. Advanced News Reporting. 3 Credits.**

Assignments to more difficult beat areas, team reporting and some investigative reporting for community newspaper. Individual conferences and weekly class sessions on contemporary reporting problems. Prerequisite: Journalism [JOURN] 4450.

**JOURN 4462. Emerging Technologies in Journalism. 1-3 Credit.**

This course quickly responds to technology developments in journalism through a combination of theory, practice and research. Students learn to use the developing technology and also strategies to manage its impact on media organizations while expanding academic discourse. Prerequisite: junior standing; restricted to Journalism and Science and Agricultural Journalism students only. May be repeated for credit. Graded on A/F basis only.

**JOURN 4464. Magazines Across Platforms. 3 Credits.**

The class covers content creation, storytelling, presentation and innovation for the Web and tablets. Students will explore magazine production methods, print-to-Web interaction, mobile initiatives and iPad app builds. They will learn to work as digital editors for Vox magazine. Prerequisites: Journalism [JOURN] 4450 and consent of instructor required. Restricted to Journalism and Science Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 4480. Will Write for Food (and Wine). 3 Credits.**

(Same as Science and Agricultural Journalism [SCI\_AG\_J] 4480) Course focuses on food and wine writing in current U.S. culture. Come ready to create mouthwatering narrative and actively seek publishing your finished work. An emphasis will be placed on class participation and written critiques of peer-reviewed articles in class. Prerequisites: Junior standing, instructors consent and Journalism [JOURN] 4450. Restricted to Journalism and Science Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 4500. News Design. 3 Credits.**

Continuation of desk editing with emphasis on page design, graphics and typography. Prerequisite: Journalism [JOURN] 4406, 4408 or instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4502. Multimedia Planning and Design. 3 Credits.**

Class covers the basics of web design - Storyboarding, navigation, information architecture, reader behavior, usability studies - as they relate to journalistic stories and persuasive messages. Prerequisites: One of the following: Journalism [JOURN] 4804 or 4450 or 4306; instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4506. Magazine Design. 3 Credits.**

Introduction to typography of magazines from manuscript markup through layout to page proof. Extensions and limitations of typography are considered in light of current practice and economic possibilities. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4508. Information Graphics. 3 Credits.**

Work as a news artist for a daily city newspaper graphically covering community news, sports and lifestyle issues. Emphasis on visual thinking and effective presentation. Experience with state-of-the-art software. Prerequisite: Journalism [JOURN] 4450 or the professional equivalent, or instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4510. Visual Communication. 3 Credits.**

How to communicate through pictures. Topics: visual perception, vocabulary, the role of words, picture editing, design and layout, printers, taste and judgment, camera mechanics. For journalism students who are not photographers. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4550. Basic Photography and Photo Editing. 3 Credits.**

A basic survey for non-photojournalism majors and others with no prior experience who desire a working knowledge of photojournalistic theory and practice. Prerequisite: instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4554. Visual Editing for Multimedia. 3 Credits.**

This class develops understanding of multimedia storytelling by focusing on editing, production, and business model practices for online visual journalism. It builds on a foundation of digital editing, photojournalism, photo editing, videography, and multimedia production. Prerequisite: Journalism [JOURN] 4804 or 4550 or 4306 or 4406 or 4506 and instructor's consent; restricted to Journalism and Science and Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 4556. Fundamentals of Photojournalism. 3 Credits.**

A rigorous skills course for advanced students preparing for a career in photojournalism consisting of weekly exercises in black and white and color photographic story telling and lectures that explore the philosophical, historical and ethical roots of the profession. Prerequisite: instructor's consent.

**JOURN 4558. Advanced Techniques in Photojournalism. 3 Credits.**

Advanced techniques and problem solving in photojournalism. Stresses lighting techniques--available, studio, electronic flash and color correction of color film. Strobed documentary, portraiture, fashion, food, architecture, sports. Prerequisite: Journalism [JOURN] 4556. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4560. Staff Photojournalism. 3 Credits.**

A laboratory course exploring the photojournalist's role in the news-gathering process. As staffers for the Columbia Missourian, students cover news, sports, features, food assignments and originate single pictures and stories. Prerequisite: Journalism [JOURN] 4558. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4562. Photojournalism Business Practices. 2 Credits.**

Discusses legal, financial, organizational and entrepreneurial issues for photojournalists. Prerequisites: Journalism [JOURN] 4558/7558 and 4566/7566 or consent of instructor; junior standing; restricted to Journalism and Science and Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 4564. Micro-Documentary Photojournalism and Videography. 3 Credits.**

This course extends student's understanding and abilities to produce short-form video journalism. They will produce, from concepts to web publication, two five-minute non-fiction videos that serves the public through engaging visual sound techniques and compelling narrative. Prerequisites: Journalism [JOURN] 4558/7558 or 4306/7306 or 4804/7804 or instructor's consent. Restricted to Journalism and Science and Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 4566. Electronic Photojournalism. 3 Credits.**

Concepts and skills to incorporate photographs, audio and video for interactive presentation, with an emphasis on project design and coding for web and mobile devices. Prerequisite: Journalism [JOURN] 4556 and instructor's consent. Graded on A/F basis only.

**JOURN 4568. History of Photojournalism. 3 Credits.**

Examination of the aesthetic and technological development of photography from its invention in 1839 to the present. Primary emphasis on the evolution and impact of the picture press and the documentary tradition in America, although international developments are studied as well.

**JOURN 4650. International Issues Reporting. 3 Credits.**

An advanced professional seminar on how to recognize, report and write about the domestic influence of international political, economic and cultural problems and trends. Prerequisites: Journalism [JOURN] 4450.

**JOURN 4656. International News Media Systems. 3 Credits.**

A comparative survey of current news media systems and how they affect the international flow of information. Newspapers, news agencies, broadcasting and satellite networks of the world are analyzed. Prerequisite: junior standing in Journalism or Science and Agricultural Journalism .

**JOURN 4658. International Journalism. 3 Credits.**

An examination of the gathering, editing and dissemination of international news. The impact of social, economic, cultural and political structures on news media performance is evaluated. Prerequisites: junior standing. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4660. Media Forces Shaping the European Union. 3 Credits.**

Seminar analyzes the role of media in shaping policies and actions of the European Union member nations and their people. Open to graduate students regardless of major and to undergraduates with instructor's consent. Course qualifies for EU Certificate Program. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4662. Global News Across Platforms. 3 Credits.**

Online, radio, and print production for a converged media enterprise, Global Journalist. Students report, write, plan, edit, design, and produce an international magazine, radio program, and website while working under weekly deadlines. Restricted to Journalism and Science and Agricultural Journalism majors. Instructor's consent required.

**JOURN 4670. Newspaper Photo Desk Management. 3 Credits.**

Survey of management of photographic journalism, art illustration and design in newspapers; includes work on graphics desk of Columbia Missourian. Prerequisites: Journalism [JOURN] 4560 or 4226 or 4408 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.



**JOURN 4700. Participatory Journalism. 3 Credits.**

An examination of how information is shared outside professional journalism, and how journalists can interact with communities. Topics will include community collaboration, social media, audience outreach and understanding, and an expanding definition of "news.". Students will work with the community on behalf of the Missourian. All interest areas welcome. Prerequisites: Journalism [JOURN] 4450, 4802, or 4300 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4706. The Community Newspaper. 3 Credits.**

The role of the newspaper in the community. Handling of news categories especially applicable to smaller newspaper. Field trips giving students experience in publishing newspapers in the state. Prerequisites: Journalism [JOURN] 2100. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4710. Newspaper Management. 3 Credits.**

Department-by-department organization, business practices, personnel, rate structures, equipment, production, laws and regulations of concern to newspaper management. Cases examine critical newspaper management issues.

**JOURN 4716. Women and the Media. 2 Credits.**

(same as Women's and Gender Studies [WGST] 4716). Focus on portrayal of women in American mass media. Other goals: historical perspective on women as journalists; exposure to issues usually not covered by mass media; research and writing skills. Prerequisite: instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only. Junior standing required.

**JOURN 4718. Law and the Courts. 3 Credits.**

Lectures, readings, discussions, writing assignments relating to justice system reporting from the view of attorneys, prosecutors, judges, correction and probation officers with the cooperation of the Missouri Bar. Prerequisites: Journalism [JOURN] 2100. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4720. Internet Law. 3 Credits.**

This course will focus on how to avoid legal pitfall while doing e-mail or e-commerce or browsing the Web and how to use the law to your benefit. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4728. Confronting Controls on Information. 3 Credits.**

A review of actions by government, society and the communications media calculated to limit or alter the content of information in the United States and elsewhere around the world. Prerequisite: instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4730. Journalism and Conflict. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4830). Introduction to the basic principles of conflict theory and negotiation, including the sources of conflict, why conflict escalates and what the conditions are for de-escalation, all with a special emphasis on the implications for the working journalist.

**JOURN 4734. Journalism and Chaos: How to Understand and Cover 21st Century Business Models. 3 Credits.**

The purpose of this class is to explore alternative business/journalism models that can be grown from the rib of the traditional newsroom. Prerequisites: Junior Standing. Restricted to Journalism and Science and Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 4736. Changing Media Business Models. 3 Credits.**

Analysis of the economic changes in news media industry. Explore concepts and theories of monetizing media. Hands-on experience in creating innovations in media business models. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4738. General Semantics in Journalism. 1-3 Credit.**

The everyday usefulness of the methods of science as applied to language and the practice of journalism. The course deals with the general effect of language habits on journalists and their readers/listeners. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4802. Fundamentals of TV, Radio and Photojournalism. 3 Credits.**

Skills, theory and ethics of broadcast news and photojournalism for non-broadcast majors. Prerequisites: Journalism [JOURN] 2100 with instructor's consent. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only. Sophomore standing required.

**JOURN 4804. Convergence Reporting. 3 Credits.**

Practice and theory of reporting for converged media. Students produce multimedia reports for traditional and converged media operations. Prerequisites: Journalism [JOURN] 2150, Graded on A-F basis only. Restricted to Convergence, Print and Digital and Photojournalism students, and Science and Agricultural Journalism students with junior standing.

**JOURN 4806. Convergence Editing and Producing. 3 Credits.**

Practice and theory of editing and producing material for publication or broadcast in a converged environment. Students produce media for multiple outlets. Prerequisites: Journalism [JOURN] 4804 or 4450, or by consent of instructor. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4810. Advanced Global Converged News. 3 Credits.**

Internet news services offers real-world newsroom experience synthesizing worldwide news coverage and revealing alternative perspectives on current events. Prerequisite: instructor consent; junior or higher standing. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4812. Online Audience Development. 3 Credits.**

Experience in developing online audiences gained through hands-on work at an Internet site. Prerequisite: junior standing; instructor's consent. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4814. Multimedia Sports Journalism. 3 Credits.**

Assignments on a daily regional website and radio station covering sports with converged media. Experience in reporting game and feature stories under deadline conditions. Prerequisites: Journalism [JOURN] 4450/7450 or 4804/7804 or 4556/7556 or 4560/7560. Restricted to Journalism and Science and Agricultural Journalism students only. Instructor consent required. Graded on A/F basis only.

**JOURN 4940. Internship in Journalism. 1-3 Credit.**

Credit for approved employment in journalism. Specifications for this course appear in the Undergraduate Catalog. Prerequisite: Journalism students only. Graded on S/U basis only.

**JOURN 4950. Understanding Audiences. 3 Credits.**

Focuses on the recipients of journalistic efforts by teaching students to identify, analyze and address media audiences. Students will learn a

variety of research methods and gain hands-on experience with audience analysis through team-based practical projects. Prerequisites: Journalism [JOURN] 2000 and junior standing.

**JOURN 4952. Strategic Communication Research I. 3 Credits.**

Introduction to techniques and practice of strategic communication research. Emphasis on research techniques and use of research results, including consumer analysis, attitude measurement and evaluation of externally supplied research. Restricted to Strategic Communication students only. Junior standing or higher required.

**JOURN 4970. Strategic Campaigns. 3 Credits.**

This capstone course, gives students a hands-on opportunity to use their skills and apply strategic communication learning to a real client situation. To be taken final semester. Application required for Mojo Ad section and will include additional leadership responsibilities. Prerequisite: Journalism [JOURN] 4206 or 7206. Restricted to Strategic Communication students only.

**JOURN 4974. Advanced Internet Applications for Radio/TV News. 3 Credits.**

Integration of advanced Internet research and publishing skills with production and management of the KOMU-TV/KBIA Radio World Wide Web news service. Prerequisite: Journalism [JOURN] 4306.

**JOURN 4976. Seminar in Radio/TV News. 3 Credits.**

Seminar in network and local news process, in coverage of major issues and social problems, in relationships of radio-TV news and government institutions. Prerequisite: instructor's consent.

**JOURN 4978. Media Management and Leadership. 3 Credits.**

Dramatic changes in technology and the media's role in converging technologies require new management and leadership techniques and paradigms. Students will write case examining these changes. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4980. The Picture Story and Photographic Essay. 3 Credits.**

Production of photo stories/essays for newspapers, magazines and news media presentations. Research, photography, design and layout. Final portfolio will show journalistic strength and versatility in black and white, and color. Prerequisite: Journalism [JOURN] 4560.

**JOURN 4984. Magazine Staff. 3 Credits.**

A laboratory course exploring the role of editorial staff in the magazine editing process. As staff for school-produced magazines, students plan, edit, write display type, proofread and coordinate with writers, photographers and designers. Prerequisites: Journalism [JOURN] 4410, 4408 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4986. Advanced Writing. 3 Credits.**

For those who wish to emphasize writing as a career. In addition to writing assignments, students discuss writings of well-known magazine and book authors. Prerequisites: Journalism [JOURN] 4450, 4410 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4988. Advanced Magazine Design. 3 Credits.**

Class critiques of spreads, sequences, and magazines are implemented by students who make typographic specifications and design individual spreads, and complete magazines for actual printed production. Prerequisite: Journalism [JOURN] 4506. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4990. Journalism and Democracy. 3 Credits.**

This course seeks to cultivate critical-thinking skills by helping students synthesize and apply knowledge gained from a journalism education to the evaluation of news media performance in a democratic society. Prerequisite: Journalism [JOURN] 4450 and second-semester senior standing. Undergraduates only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4992. Reporting, Editing and Marketing of Converged Media. 3 Credits.**

Capstone course bring together the reporting, editing, management and marketing skills gained in previous convergence courses. Students plan, produce, promote and evaluate longform, creative journalistic content. Prerequisite: Journalism [JOURN] 4806, senior standing and instructor's consent. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 4994. Magazine Publishing. 3 Credits.**

The audience, economics, job opportunities and content of the American magazine. Deals with general audience and specialized magazines, business and institutional magazines, news magazines, etc. Case histories of individual magazines, guest lecturers from various fields. Prerequisites: Journalism [JOURN] 4408 and 4410 or 4508. Graded on A/F basis only. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 7000. Communications Law. 3 Credits.**

Legal concepts, including prior restraint, libel, privacy, obscenity, contempt and access as they relate to print, broadcast, advertising and other areas. Prerequisite: graduate standing.

**JOURN 7050. Communications Practice. 1-3 Credit.**

Special instruction in the school's media as an extension of existing advanced media courses, or, in advertising, an extension of advertising creative courses. Contract must be approved by instructor and dean. Prerequisite: graduate standing. Study Abroad sections require consent by International Program. Obtain consent in 76 Gannett. Some sections of the course may be offered on either A/F or S/U graded basis only.

**JOURN 7056. Intersession Colloquium. 1 Credit.**

Lecture portion of any course the student plans to take later during an intersession. Prerequisite: graduate standing and Dean's consent.

**JOURN 7058. New York Program: Journalism Theory and Practice. 2-3 Credit.**

Interdisciplinary course offering on-site study at national media venues in New York. Journalism alumni working in Manhattan provide weekly discussions on contemporary practices, job networks and work experiences. Prerequisite: graduate standing.

**JOURN 7120. New Media Basics. 1 Credit.**

Students will learn how to use the Internet to communicate with others, find human and electronic sources for stories and publish on the World Wide Web. Prerequisite: graduate standing.

**JOURN 7122. Fundamentals of Data Reporting. 1 Credit.**

Explores the importance to journalists of mining public records and data; reviews basic newsroom mathematics; teaches basic techniques for using Microsoft Excel to create and manipulate spreadsheets and to produce graphics. Graded on A-F basis only. Prerequisites: JOURN 2100; This course is not to be taken by students who have already completed JOURN 4430 or JOURN 7430. Restricted to Graduate Journalism students.

**JOURN 7126. Digital Audio and Visual Basics for Journalists. 1 Credit.**

Introduces journalism students to audio and video tools used in converged environments. Students will create news stories, ads or promos to meet journalistic or strategic communication goals. Prerequisite: graduate standing.

**JOURN 7130. Account Services. 1 Credit.**

Designed for advanced strategic communication students preparing for careers in account services. Section topics vary. Prerequisite: graduate standing.

**JOURN 7136. Creative Techniques. 1 Credit.**

Designed for advanced strategic communication students preparing for careers in creative work. Section topics vary. Prerequisite: graduate standing.

**JOURN 7138. Public Relations Techniques. 1 Credit.**

Designed for advanced strategic communication students preparing for careers in public relations. Section topics vary. Prerequisite: graduate standing.

**JOURN 7140. Interactive Techniques. 1 Credit.**

Designed for advanced strategic communications students preparing for careers in interactive media. Section topics may vary. Prerequisite: graduate standing.

**JOURN 7146. Strategic Communication Techniques. 1 Credit.**

Designed for advanced strategic communication students. Section topics vary. Prerequisite: graduate standing.

**JOURN 7148. Interviewing Essentials. 1 Credit.**

This class allows students to focus on the journalistic interviewing process, from spot news interviews to the sort of interviews required for personality, sports and in-depth work. Prerequisite: graduate standing.

**JOURN 7150. Using Infographics. 1 Credit.**

An introduction to the various types of information graphics and how each can be used effectively to help explain the news. Additional emphasis on generating graphic ideas and on the specific challenges of gathering information for graphics. Prerequisites: graduate standing and instructor's consent.

**JOURN 7152. Concepts in Participatory Journalism. 1 Credit.**

Journalists need to know how to be in conversation with their communities rather than lecture to them. In this course, we will look at how a collaborative culture is changing journalism, and how journalists can take advantage of the new landscape. Prerequisite: Journalism [JOURN] 2100, 2150. Graded on A/F basis only.

**JOURN 7198. Area Seminar. 3 Credits.**

Special lectures, readings, discussions relating to the urban journalism, state government reporting or local public affairs reporting programs. Prerequisite: graduate standing.

**JOURN 7200. Principles of Strategic Communication. 3 Credits.**

Foundation course familiarizing students with an array of strategic communication tools and how they are used in the field. Prerequisite: graduate standing.

**JOURN 7204. Introduction to Strategic Writing and Design. 3 Credits.**

This course will teach you about strategic writing and design, and then show you how to apply these skills to key communication platforms such as digital media, TV, radio, social media and others. Along the way, you will learn to think, write and design creatively and strategically. Graded

on A/F basis only. Prerequisite: Restricted to Journalism Strategic Communication and Science and Agriculture Journalism Majors.

**JOURN 7206. Strategic Writing I. 3 Credits.**

Students learn strategic writing for a variety of media such as print, radio, television, outdoor, new media, news releases, pitch letters and other persuasive messages. Prerequisites: graduate standing and Journalism [JOURN] 4200, 4226, 4952.

**JOURN 7208. Strategic Writing II. 3 Credits.**

Advanced course in the creation of strategic communication materials with an emphasis on strategic planning, developing creative concepts, producing and polishing copy and visuals, execution of finished product and refining. Prerequisite: graduate standing and Journalism [JOURN] 4206/7206.

**JOURN 7216. Media Sales. 3 Credits.**

Focus of this course is to familiarize students with how to sell a variety of media including newspaper, radio, television, outdoor, new media, and others. Prerequisites: graduate standing and Journalism [JOURN] 4206/7206.

**JOURN 7218. Mojo Advertising Staff. 3 Credits.**

Application of strategic communication skills in a professional services agency specializing in the youth and young adult segment. Positions include management, planning, creative, media and research. Other electives required based on position. Application required. Prerequisites: Journalism [JOURN] 4206/7206.

**JOURN 7220. Creative Portfolio. 3 Credits.**

Students will produce a free-standing collection of outstanding, polished creative work to demonstrate his/her ability to perform at a high level of creativity. Prerequisites: graduate standing, core courses and Journalism [JOURN] 4208/7208.

**JOURN 7226. Strategic Design and Visuals I. 3 Credits.**

Course gives students a foundation in visual communication in areas such as typography, balance, eye flow and layouts. Prerequisite: graduate standing.

**JOURN 7228. Strategic Design and Visuals II. 3 Credits.**

Advanced course in strategic design and visuals. Persuasive visual principles applied to variety of integrated media including print, broadcast and on-line. Prerequisite: graduate standing and Journalism [JOURN] 4206/7206.

**JOURN 7236. Psychology in Advertising. 3 Credits.**

Application of psychological principles, learning, perception, motivation, attitudes to advertising. Emphasis on the increasing use of psychographics (the "lifestyle" factor) to understand consumer wants and buying behavior. Prerequisite: graduate standing, Journalism [JOURN] 4200/7200, 4952/7952, 4226/7226.

**JOURN 7238. Broadcast Advertising. 3 Credits.**

Broadcast advertising production. Emphasis on equipment, directing, script/storyboard preparation and commercial analysis. Students become familiar with procedures, techniques and facilities used in basic radio and television production. Prerequisites: graduate standing and Journalism [JOURN] 4206/7206.

**JOURN 7248. Media Strategy and Planning. 3 Credits.**

Course deals with strategic planning and the selection and evaluation of appropriate media outlets. Students gain a clear understanding of the problems and issues involved in crafting effective media strategies, creative problem solving and selection of appropriate media. Prerequisite:

graduate standing and Journalism [JOURN] 4200/7200, 4952/7592, 4226/7226.

**JOURN 7250. Management of Strategic Communication. 3 Credits.**

How to lead and contribute to strategically sound, highly creative and seamlessly integrated strategic communication on the agency or client side of the business. Directly relevant to agency account management and account planning, as well as client career paths. Prerequisite: graduate standing. Prerequisites: Journalism [JOURN] 4200/7200, 4226/7226 and 4952/7952.

**JOURN 7256. Public Relations. 3 Credits.**

Current methods of communicating with constituents as practiced by agencies, corporations and government/not-for-profit organizations. Prerequisite: graduate standing; Journalism [JOURN] 4200.

**JOURN 7258. Global Communication. 3 Credits.**

Understanding global communication systems with an emphasis on planning and executing strategic communication campaigns. Particular attention will be paid to cultural, political and economic differences as they affect marketing and development communication. Prerequisites: graduate standing and Journalism [JOURN] 4200/7200, 4226/7226, 4952/7952.

**JOURN 7262. Interactive Advertising I. 3 Credits.**

Course covers every step from integrating Internet efforts into the overall strategic communication plan to building a website that works. Designed for those with an interest in interactive advertising. Prerequisite: Journalism [JOURN] 7200, 7226 and 7952. Graded on A/F basis only.

**JOURN 7263. Interactive Advertising II. 3 Credits.**

Course goes in-depth on top issues in the interactive process from video advertising to social networking sites and how to increase campaign performance with web analytics. Designed for those who want a career in interactive advertising. Prerequisite: Journalism [JOURN] 7262; graduate standing required. Graded on A/F basis only.

**JOURN 7268. Strategic Communication Practicum. 3 Credits.**

Practical experience in public relations, corporate communications and strategic planning with the Missouri School of Journalism serving as client. Students from all journalism disciplines will apply knowledge and skills on a variety of platforms. Prerequisite: Journalism [JOURN] 4206/7206 for Advertising students, JOURN 4306/7306 for Broadcast students, JOURN 4450/7450 for News-Editorial and Magazine students, JOURN 4556/7556 for Photojournalism students.

**JOURN 7270. Public Relations Writing. 3 Credits.**

Develop skills and capabilities in strategic communication applications, including news releases, media advisories, pitch letters, video news releases, media relations techniques, writing for electronic and broadcast media, feature writing, brochures and speeches. Prerequisite: Journalism [JOURN] 4206 and 4256. Graded on A/F basis only.

**JOURN 7300. Broadcast News I. 3 Credits.**

Beginning reporting and news writing for radio, television and their on-line services. Introduction to use of audio and video recorders and editing systems in production of news stories. Consideration of ethical issues, economic factors, relationships with news sources and gender and ethnic diversity in the newsroom and in news stories. Prerequisite: graduate standing and Journalism [JOURN] 2100.

**JOURN 7301. Topics in Journalism. 1-3 Credit.**

Selected current topics in journalism. Specific topics to be announced at time of registration. Prerequisite: graduate standing.

**JOURN 7306. Broadcast News II. 3 Credits.**

Introduction to general assignment reporting skills for the newsroom environment. Instruction in time management, writing, storytelling and performance. Team skills and ethnic diversity in the newsroom are discussed. Students begin work for broadcast newsrooms. Prerequisite: graduate standing and Journalism [JOURN] 4300/7300.

**JOURN 7308. Broadcast News III. 3 Credits.**

Intermediate reporting and news writing skills for radio and television. Advanced techniques in the use of video and sound in production of news stories. Prerequisite: graduate standing and Journalism [JOURN] 4306/7306.

**JOURN 7310. News Producing. 3 Credits.**

Instruction in techniques of television newscast preparation. Emphasis on role of the television news producer. Prerequisite: graduate standing and Journalism [JOURN] 4308/7308.

**JOURN 7320. Advanced Broadcast Reporting. 3 Credits.**

In-depth reporting and editing for radio or television; advanced production techniques; emphasis on writing, interviewing, effective use of audio or videotape at KOMU-TV or KBIA. Prerequisites: graduate standing and Journalism [JOURN] 4308/7308.

**JOURN 7328. Advanced News Communication. 1 Credit.**

This course will examine and practice the components of effective interviewing and on-set and live reporting for television news. Students will anchor KOMU-TV's morning newscasts. Prerequisite: Journalism [JOURN] 4306/7306.

**JOURN 7350. Problems in Journalism. 1-3 Credit.**

Independent research arranged with individual faculty member. Contract must be approved by instructor and dean. Not accepted as a substitute for any regularly scheduled course. Prerequisite: graduate standing. Some sections of the course may be offered on either A/F or S/U graded basis only.

**JOURN 7400. Introduction to News Editing. 3 Credits.**

Introduces the fundamentals of editing of stories and writing headlines for publication online and in print, including an emphasis on style and grammar. Emphasized editing for an online audience. Prerequisite: Journalism [JOURN] 2100.

**JOURN 7406. News Editing. 3 Credits.**

Laboratory work on the Columbia Missourian plus lectures on ethics, page design and news decision making. Prerequisite: graduate standing and Journalism [JOURN] 4400/7400.

**JOURN 7408. Magazine Editing. 3 Credits.**

Review of grammar, punctuation, style rules: measuring articles copy fitting: writing captions, titles; editing, proofreading, condensing, rewriting magazine articles. Prerequisites: Journalism [JOURN] 4450/7450.

**JOURN 7410. Intermediate Writing. 3 Credits.**

In-depth research and writing techniques. Students produce articles for the Missourian and school-produced magazines or other publications. Prerequisites: graduate standing and Journalism [JOURN] 4450/7450 or equivalent and instructor's consent.

**JOURN 7412. Lifestyle Journalism. 3 Credits.**

In-depth research and writing techniques focused on lifestyle journalism. Students produce articles for the Missourian and school-produced magazines or other publications. Prerequisites: Journalism [JOURN] 4450/7450 or equivalent and instructor's consent. Substitutes for JOURN 4410/7410. Graded on A/F basis only.

**JOURN 7414. Field Reporting on the Food System and Environment. 3 Credits.**

(same as Science and Agricultural Journalism [SCI\_AG\_J] 7414)  
Field reporting on the social, political, scientific, economic and ethical dimensions of the food system and environment, with emphasis on explanatory story-telling. Includes multi-day field trip. Prerequisite: instructor's consent. Graded on A/F basis only.

**JOURN 7416. Science, Health and Environmental Writing. 3 Credits.**

Advanced course in the reporting of science, health and environment. Write for publication. Prerequisite: graduate standing and Journalism [JOURN] 4450/7450 and instructor's consent.

**JOURN 7418. Critical Reviewing. 3 Credits.**

A combination of theory and practice that covers the philosophy and craft of reviewing the arts, including books, movies, television, dance, painting, sculpture and architecture. Students must attempt to publish reviews and essays locally, regionally and nationally. Reviews published in Sunday Magazine. Prerequisites: graduate standing and Journalism [JOURN] 0900 or 2100 and instructor's consent.

**JOURN 7420. Editorial Writing. 3 Credits.**

Emphasizes writing and thinking. Discussion of current problems. Correct and effective use of English language. Mission, obligations and history of editorial pages. Prerequisite: graduate standing and Journalism [JOURN] 4450.

**JOURN 7422. Sports Journalism. 3 Credits.**

A review of everything from "How to Watch Sports" to the history of sports writing. Prerequisites: Journalism [JOURN] 4450/7450 or 4804/7804 or 4306/7306. Restricted to Journalism and Agricultural Journalism students only. Graduate Standing required.

**JOURN 7426. Religion Reporting and Writing. 3 Credits.**

(same as Religious Studies [REL\_ST]7418). Advanced seminar in religion reporting and writing. Examines the role of religion journalism in faith, public life and culture. Prerequisite: graduate standing and Journalism [JOURN] 4450/7450 or its equivalent in professional writing experience and instructor's consent.

**JOURN 7428. Health Reporting Skills. 2-3 Credit.**

This course focuses on reporting, sourcing and analysis techniques journalists use to understand and report on health policy, health-care quality, medical research and the business of health care. Course graded A-F only. Prerequisites: Journalism [JOURN] 4450/7450, 4306/7306 or 4804/7804 and instructor's consent.

**JOURN 7430. Computer-Assisted Reporting. 3 Credits.**

How to negotiate for, transfer and process electronic information; the unique opportunities computers provide for analyzing information. Prerequisite: graduate standing.

**JOURN 7436. Investigative Reporting. 3 Credits.**

Advanced course designed to acquaint reporters with public issues. Students write two in-depth projects and other shorter assignments. Students meet weekly with instructor for editorial suggestions. Prerequisites: graduate standing and Journalism [JOURN] 4450/7450 and instructor's consent.

**JOURN 7438. Business and Economics Reporting. 3 Credits.**

Advanced reporting course concentrating on writing and reporting about business and the economy. Emphasis on sources, records, documents and writing techniques. Prerequisites: graduate standing and Journalism [JOURN] 4408/7408 and 4410/7410 or 4506/7506.

**JOURN 7440. Mapping for Stories and Graphics. 2 Credits.**

Learn mapping software to discover information for news stories and lay the foundations for compelling news information graphics. Students will learn how to create maps for print, broadcast and online. Prerequisites: Journalism [JOURN] 2100 and instructor's consent. Graded on A/F basis only.

**JOURN 7450. News Reporting. 3 Credits.**

Assignments on a daily city newspaper covering community news, city, county and state affairs, sports and lifestyle issues. Experience in gathering and writing news, writing under deadline conditions. Prerequisites: graduate standing and Journalism [JOURN] 0900 or 2100.

**JOURN 7460. Advanced News Reporting. 3 Credits.**

Assignments to more difficult beat areas, team reporting, and some investigative reporting for community newspaper. Individual conferences and weekly class sessions on contemporary reporting problems. Prerequisite: graduate standing and Journalism [JOURN] 4450/7450.

**JOURN 7462. Emerging Technologies in Journalism. 1-3 Credit.**

This course quickly responds to technology developments in journalism through a combination of theory, practice and research. Students learn to use the developing technology and also strategies to manage its impact on media organizations while expanding academic discourse. May be repeated for credit. Graduate standing required. Graded A-F only.

**JOURN 7464. Magazines Across Platforms. 3 Credits.**

The class covers content creation, storytelling, presentation and information for the Web and tablets. Students will explore magazine production methods, print-to-Web interaction, mobile initiatives and iPad app builds. They will learn to work as digital editors for Vox magazine. Prerequisite: Journalism [JOURN] 4450/7450. Restricted to Journalism and Science and Agricultural Journalism students only. Graduate standing required. Consent of instructor required. Graded on A/F basis only.

**JOURN 7480. Will Write for Food (and Wine). 3 Credits.**

(Same as Science and Agricultural Journalism [SCI\_AG\_J] 7480) Course focuses on food and wine writing in current U.S. culture. Come ready to create mouthwatering narrative and actively seek publishing your finished work. An emphasis will be placed on class participation and written critiques of peer-reviewed articles in class. Prerequisites: Junior standing, instructor's consent and Journalism [JOURN] 4450. Restricted to Journalism and Science Agriculture Journalism students only. Graded on A/F basis only.

**JOURN 7500. News Design. 3 Credits.**

Continuation of desk editing with emphasis on page design, graphics and typography. Prerequisite: graduate standing and Journalism [JOURN] 4406/7406, 4408/7408 or instructor's consent.

**JOURN 7502. Multimedia Planning and Design. 3 Credits.**

Class covers the basics of web design - Storyboarding, navigation, information architecture, reader behavior, usability studies - as they relate to journalistic stories and persuasive messages. Prerequisites: One of the following: Journalism [JOURN] 4804 or 4450 or 4306; instructor's consent. Graduate Standing Required.

**JOURN 7506. Magazine Design. 3 Credits.**

Introduction to typography of magazines from manuscript markup through layout to page proof. Extensions and limitations of typography are considered in light of current practice and economic possibilities. Prerequisite: graduate standing.

**JOURN 7508. Information Graphics. 3 Credits.**

Work as a news artist for a daily city newspaper graphically covering community news, sports and lifestyle issues. Emphasis on visual thinking and effective presentation. Experience with state-of-the-art software. Prerequisite: graduate standing and Journalism [JOURN] 4450/7450 or the professional equivalent, or instructor's consent.

**JOURN 7510. Visual Communications. 2-3 Credit.**

How to communicate through pictures. Topics: visual perception, vocabulary, the role of words, picture editing, design and layout, printers, taste and judgment, camera mechanics. For journalism students who are not photographers. Prerequisite: graduate standing.

**JOURN 7550. Basic Photography and Photo Editing. 3 Credits.**

A basic survey for non-photojournalism majors and others with no prior experience who desire a working knowledge of photojournalistic theory and practice. Prerequisite: graduate standing and instructor's consent.

**JOURN 7554. Visual Editing for Multimedia. 3 Credits.**

This class develops understanding of multimedia storytelling by focusing on editing, production, and business model practices for online visual journalism. It builds on a foundation of digital editing, photojournalism, photo editing, videography, and multimedia production. Prerequisite: Journalism [JOURN] 4804 or 4550 or 4306 or 4406 or 4506 and instructor's consent; restricted to Journalism and Science and Agriculture Journalism students only. Graded on A/F basis only.

**JOURN 7556. Fundamentals of Photojournalism. 3 Credits.**

A rigorous skills course for advanced students preparing for a career in photojournalism consisting of weekly exercises in black and white and color photographic story telling and lectures that explore the philosophical, historical and ethical roots of the profession. Prerequisite: graduate standing and instructor's consent.

**JOURN 7558. Advanced Techniques in Photojournalism. 3 Credits.**

Advanced techniques and problem solving in photojournalism. Stresses lighting techniques--available, studio, electronic flash and color correction of color film. Strobed documentary, portraiture, fashion, food, architecture, sports. Prerequisite: graduate standing and Journalism [JOURN] 4556/7556.

**JOURN 7560. Staff Photojournalism. 3 Credits.**

A laboratory course exploring the photojournalist's role in the news-gathering process. As staffers for the Columbia Missourian, students cover news, sports, features, food assignments and originate single pictures and stories. Prerequisite: graduate standing and Journalism [JOURN] 4558/7558.

**JOURN 7562. Photojournalism Business Practices. 2 Credits.**

Discusses legal, financial, organizational and entrepreneurial issues for photojournalists. Prerequisites: Journalism [JOURN] 4558/7558 and JOURN 4566/7566, or consent of instructor. Restricted to graduate Journalism majors only. Graded on A-F basis only.

**JOURN 7564. Micro-Documentary Photojournalism and Videography. 3 Credits.**

This course extends students' understanding and abilities to produce short-form video journalism. They will produce, from concept to web publication, two five-minute non-fiction videos that serves the public through engaging visual sound techniques and compelling narrative. Prerequisites: Journalism [JOURN] 4558/7558 or 4306/7306 or 4804/7804 or consent of instructor. Restricted to Journalism or Science and Agricultural Journalism students only. Graded on A/F basis only.

**JOURN 7566. Electronic Photojournalism. 3 Credits.**

Concepts and skills to incorporate photographs, audio and video for interactive presentation, with an emphasis on project design and coding for web and mobile devices. Prerequisite: Journalism [JOURN] 4556/7556 and instructor's consent; graduate standing required. Graded on A/F basis.

**JOURN 7568. History of Photojournalism. 3 Credits.**

Examination of the aesthetic and technological development of photography from its invention in 1839 to the present. Primary emphasis on the evolution and impact of the picture press and the documentary tradition in America, although international developments are studied as well. Prerequisite: graduate standing.

**JOURN 7650. International Issues Reporting. 3 Credits.**

An advanced professional seminar on how to recognize, report and write about the domestic influence of international political, economic and cultural problems and trends. Prerequisites: graduate standing and Journalism [JOURN] 4450/7450.

**JOURN 7656. International News Media Systems. 3 Credits.**

A comparative survey of current news media systems and how they affect the international flow of information. Newspapers, news agencies, broadcasting and satellite networks of the world are analyzed. Prerequisite: graduate standing.

**JOURN 7658. International Journalism. 3 Credits.**

An examination of the gathering, editing and dissemination of international news. The impact of social, economic, cultural and political structures on news media performance is evaluated. Prerequisites: graduate standing.

**JOURN 7660. Media Forces Shaping the European Union. 3 Credits.**

Seminar analyzes the role of media in shaping policies and actions of the European Union member nations and their people. Open to graduate students regardless of major and to undergraduates with instructor's consent. Course qualifies for EU Certificate Program.

**JOURN 7662. Global News Across Platforms. 3 Credits.**

Online, radio, and print production for a converged media enterprise, Global Journalist. Students report, write, plan, edit, design, and produce an international magazine, radio program, and website while working under weekly deadlines. Consent of instructor required. Restricted to Journalism and Agricultural Journalism majors.

**JOURN 7670. Newspaper Photo Desk Management. 3 Credits.**

Survey of management of photographic journalism, art illustration and design in newspapers; includes work on graphics desk of Columbia Missourian. Prerequisites: graduate standing and Journalism [JOURN] 4560/7560 or 4226/7226 or 4408/7408 and instructor's consent.

**JOURN 7700. Participatory Journalism. 3 Credits.**

An examination of how information is shared outside professional journalism, and how journalists can interact with communities. Topics will include community collaboration, social media, audience outreach and understanding, and an expanding definition of "news." Students will work with the community on behalf of the Missourian. All interest areas welcome. Prerequisites: Journalism [JOURN] 7450, or 7300 and instructor's consent. Restricted to Journalism and Science and Agricultural Journalism majors only.

**JOURN 7706. The Community Newspaper. 3 Credits.**

The role of the newspaper in the community. Handling of news categories especially applicable to smaller newspaper. Field trips giving students

experience in publishing newspapers in the state. Prerequisites: graduate standing and Journalism [JOURN] 0900 and 2100.

**JOURN 7710. Newspaper Management. 3 Credits.**

Department-by-department organization, business practices, personnel, rate structures, equipment, production, laws and regulations of concern to newspaper management. Cases examine critical newspaper management issues. Prerequisite: graduate standing.

**JOURN 7716. Women and the Media. 2 Credits.**

(same as Women's and Gender Studies [WGST] 7716). Focus on portrayal of women in American mass media. Other goals: historical perspective on women as journalists; exposure to issues usually not covered by mass media; research and writing skills. Prerequisite: instructor's consent.

**JOURN 7718. Law and the Courts. 3 Credits.**

Lectures, readings, discussions, writing assignments relating to justice system reporting from the view of attorneys, prosecutors, judges, correction and probation officers, with the cooperation of the Missouri Bar. Prerequisites: graduate standing and Journalism [JOURN] 0900 or 2100.

**JOURN 7720. Internet Law. 3 Credits.**

This course will focus on how to avoid legal pitfall while doing e-mail or e-commerce or browsing the Web and how to use the law to your benefit. Prerequisite: graduate standing.

**JOURN 7728. Confronting Controls on Information. 3 Credits.**

A review of actions by government, society and the communications media calculated to limit or alter the content of information in the United States and elsewhere around the world. Prerequisite: graduate standing and instructor's consent.

**JOURN 7730. Journalism and Conflict. 3 Credits.**

Introduction to the basic principles of conflict theory and negotiation, including the sources of conflict, why conflict escalates and what the conditions are for de-escalation, all with a special emphasis on the implications for the working journalist. Prerequisite: graduate standing.

**JOURN 7734. Journalism and Chaos: How to Understand and Cover 21st Century Business Models. 3 Credits.**

The purpose of this class is to explore alternative business/journalism models that can be grown from the rib of the traditional newsroom. Restricted to Journalism and Agricultural Journalism students only. Graduate Standing required.

**JOURN 7736. Changing Media Business Models. 3 Credits.**

Analysis of the economic changes in news media. Explore concepts and theories of monetizing media. Hands-on experience in creating innovations in media business models.

**JOURN 7738. General Semantics in Journalism. 1-3 Credit.**

The everyday usefulness of the methods of science as applied to language and the practice of journalism. The course deals with the general effect of language habits on journalists and their readers/listeners. Prerequisite: graduate standing.

**JOURN 7802. Fundamentals of TV, Radio and Photojournalism. 3 Credits.**

Skills, theory and ethics of broadcast news and photojournalism for non-broadcast majors. Prerequisite: Journalism [JOURN] 2100; graduate standing required. Graded on A/F basis only.

**JOURN 7804. Convergence Reporting. 3 Credits.**

Practice and theory of reporting for converged media. Students produce multimedia reports for traditional and converged media operations. Prerequisites: Journalism [JOURN] 7802 or instructor's consent. Graded on A/F basis only.

**JOURN 7806. Convergence Editing and Producing. 3 Credits.**

Practice and theory of editing and producing material for publication or broadcast in a converged environment. Students produce media for multiple outlets. Prerequisite: Journalism [JOURN] 4804/7804; graduate standing required and instructor's consent. Graded on A/F basis only.

**JOURN 7810. Advanced Global Converged News. 3 Credits.**

Internet news services offers real-world newsroom experience synthesizing world wide news coverage and revealing alternative perspectives on current events. Prerequisites: instructor's consent; graduate standing. Graded on A/F basis only.

**JOURN 7812. Online Audience Development. 3 Credits.**

Experience in developing online audiences gained through hands-on work at an Internet site. Consent of Instructor required. Graduate standing required. Graded A-F only.

**JOURN 7814. Multimedia Sports Journalism. 3 Credits.**

Assignments on a daily regional website and radio station covering sports with converged media. Experience in reporting game and feature stories under deadline conditions. Prerequisites: Journalism [JOURN] 4450/7450 or 4804/7804 or 4556/7556 or 4560/7560. Restricted to Journalism and Science and Agricultural Journalism students only. Instructor consent required. Graded on A/F basis only.

**JOURN 7940. Internship in Journalism. 1-3 Credit.**

Credit for approved employment in journalism. Specifications for this course appear in the Undergraduate Catalog. Restricted to Journalism students only. Graded on S/U basis only.

**JOURN 7952. Strategic Communication Research I. 3 Credits.**

Introduction to techniques and practice of strategic communication research. Emphasis on research techniques and use of research results, including consumer analysis, attitude measurement and evaluation of externally supplied research. Prerequisite: graduate standing.

**JOURN 7970. Strategic Campaigns. 3 Credits.**

This capstone course gives students a hands-on opportunity to use their skills and apply strategic communication learning to a real client situation. To be taken final semester. Application required for Mojo Ad section and will include additional leadership responsibilities. Prerequisites: Journalism [JOURN] 4206 or 7206.

**JOURN 7974. Advanced Internet Applications for Radio/TV News. 3 Credits.**

Integration of advanced Internet research and publishing skills with production and management of the KOMU-TV/KBIA Radio World Wide Web news service. Prerequisite: graduate standing and Journalism [JOURN] 4306/7306.

**JOURN 7976. Seminar in Radio-TV News. 3 Credits.**

Seminar in network and local news process, in coverage of major issues and social problems, in relationships of radio-TV news and government institutions. Not for students who have taken Journalism [JOURN] 8096. Prerequisite: graduate standing and instructor's consent.

**JOURN 7978. Media Management and Leadership. 3 Credits.**

Dramatic changes in technology and the media's role in converging technologies require new management and leadership techniques and

paradigms. Students will write case examining these changes. Graduate Standing Required.

**JOURN 7980. The Picture Story and Photographic Essay. 3 Credits.**

Production of photo stories/essays for newspapers, magazines and news media presentations. Research, photography, design and layout. Final portfolio will show journalistic strength and versatility in black and white, and color. Prerequisite: graduate standing and Journalism [JOURN] 4560/7560.

**JOURN 7984. Magazine Staff. 3 Credits.**

A laboratory course exploring the role of editorial staff in the magazine editing process. As staff for school-produced magazines, students plan, edit, write display type, proofread and coordinate with writers, photographers and designers. Prerequisites: graduate standing and Journalism [JOURN] 4410/7410, 4408/7408 and instructor's consent.

**JOURN 7986. Advanced Writing. 3 Credits.**

For those who wish to emphasize writing as a career. In addition to writing assignments, students discuss writings of well-known magazine and book authors. Prerequisites: graduate standing and Journalism [JOURN] 4450/7450, 4410/7410 and instructor's consent.

**JOURN 7988. Advanced Magazine Design. 3 Credits.**

Class critiques of spreads, sequences, and magazines are implemented by students who make typographic specifications and design individual spreads, and complete magazines for actual printed production. Prerequisite: graduate standing and Journalism [JOURN] 4506/7506.

**JOURN 7992. Reporting, Editing and Marketing of Converged Media. 3 Credits.**

Capstone course brings together the reporting, editing, management and marketing skills gained in previous convergence courses. Students plan, produce, promote and evaluate long-form, creative journalistic content. Prerequisites: Journalism [JOURN] 4806/7806; graduate standing and instructor's consent. Graded on A/F basis only.

**JOURN 7994. Magazine Publishing. 3 Credits.**

The audience, economics, job opportunities and content of the American magazine. Deals with general audience and specialized magazines, business and institutional magazines, news magazines, etc. Case histories of individual magazines, guest lecturers from various fields. Prerequisite: graduate standing.

**JOURN 8000. Mass Media Seminar. 3 Credits.**

Concepts, functions and major problems of print and electronic media in the United States. Two hours lecture and one hour of discussion lab each week.

**JOURN 8001. Seminar on Topics in Journalism. 3 Credits.**

Problems, issues and approaches to research in selected topic areas. Specific content varies by needs of faculty and students and will be announced in advance. Master's students only. Prerequisite: graduate standing.

**JOURN 8006. Quantitative Research Methods in Journalism. 3 Credits.**

Research methods of utility in journalism and philosophy of science. Emphasis on understanding common quantitative methods and tools. Prerequisite: six hours of journalism or instructor's consent.

**JOURN 8008. Qualitative Research Methods in Journalism. 3 Credits.**

Course is designed to introduce graduate students to common qualitative approaches applicable to the study of journalism and mass

communication. Students will learn a variety of approaches, practical methodologies and tools that will help them conduct research.

**JOURN 8010. Advanced Qualitative Methods in Journalism. 3 Credits.**

Designed to familiarize doctoral students with qualitative approaches applicable to the study of journalism and mass communication. Students will be introduced to a variety of philosophical and conceptual approaches as well as to practical tools-oriented methodologies in four major areas of qualitative research.

**JOURN 8016. Advanced Quantitative Research Methods. 3 Credits.**

Experimental design, factor analysis, semantic differential and Q methodology as tools for the researcher in journalism, communication.

**JOURN 8018. Strategic Communication Research II. 3 Credits.**

Course reviews the latest principles of strategic communication with emphasis on the crucial role of research to develop informed strategy, monitor communication programs and evaluate overall campaign effectiveness.

**JOURN 8020. Principles and Tools in Strategic Communication Planning. 3 Credits.**

Introduces the latest principles of strategic communication and the importance of strategic planning in many contemporary communication fields. A significant operational component in the course introduces skills such as budgeting, scheduling objective-setting, organizing personal time, and managing people.

**JOURN 8026. Philosophy of Journalism. 3 Credits.**

Seminar deals with wide assortment of philosophical questions in journalism but concentrates on epistemology, political press theory and ethics. Such questions as "objectivity" in journalism, press responsibility, professionalism.

**JOURN 8028. The Literature of Journalism. 3 Credits.**

Reading of ten basic books about journalism. Several books are assigned to everyone; several are assigned on an individual basis, and several are electives. Oral reports, short papers, and class discussion.

**JOURN 8030. History of Mass Media. 3 Credits.**

American mass media from colonial days to present in the context of social, economic and political change. History research. Prerequisite: graduate standing.

**JOURN 8036. Historical Methods. 3 Credits.**

Graduate seminar in research methods and theoretical approaches used by media historians, including oral history, biography, quantitative and archival research.

**JOURN 8038. Seminar in Communications Law. 3 Credits.**

A graduate-level survey of issues in media law, as well as an introduction to First Amendment theory and scholarship. The course familiarizes students with fundamental concepts of mass media law through exposure to primary materials and provides students with the opportunity to analyze the issues discussed in class through individual research projects.

**JOURN 8042. Health News and Promotion. 3 Credits.**

This is an advanced seminar that examines and critiques the literature on health communication in news about health and its impact and health promotion campaigns.

**JOURN 8044. Strategic Conflict Management. 3 Credits.**

Strategic conflict management is a cross-disciplinary study that integrated organizational behavior, crisis management, conflict resolution and image repair. This course melds theory with practice, and is for those venturing



into media management, law, and strategic communication. Prerequisite: graduate journalism standing required.

**JOURN 8046. Controls of Information. 3 Credits.**

A detail of actions by government, largely the federal government, calculated to limit or alter the content of information in the United States.

**JOURN 8052. Case Studies in the Digital Globe. 3 Credits.**

This course seeks to broaden students perspective about how digital technology affects the world around us. Final course in the CDIG certificate. Inter-departmental course.

**JOURN 8054. Entrepreneurship and Media of the Future. 3 Credits.**

This course will give students an intense hands-on experience in working with real entrepreneurs on complex business problems in the journalism field. Example companies are the Associated Press, Kachingle, the Chicago Sun-Times, Spot-Us and the Media Policy Center. The goal is to offer a solution or solutions to the stated problem, and to present these ideas in a competitive, symposium environment. Graduate standing in Journalism or MBA program.

**JOURN 8056. Theory of Mass Communication. 3 Credits.**

Major communication theories and theorists. Interpersonal theories are included as they relate to mass communication.

**JOURN 8058. Communication in Media Organizations. 3 Credits.**

Covers key concepts in management and communication in media organizations, including print, broadcast, advertising and public relations. Topics include leadership, human resource management, managerial/employee communication, career success, financial decision-making, teambuilding and goal setting in media organizations. Open to students in the online master's program only.

**JOURN 8068. The Mass Media and the Presidency. 3 Credits.**

This seminar examines that historical triad of the free expression clauses of the First Amendment, the presidency and the American mass media through readings, class assignments and a project.

**JOURN 8070. Proseminar in Communications. 1-3 Credit.**

Seminar on professional and academic issues in journalism and communication. Specific discussion topics selected by faculty and students on a per class basis.

**JOURN 8080. Media Ethics. 3 Credits.**

An introduction to and application of ethical theory to their contemporary mass media. Prerequisite: graduate standing or instructor's consent.

**JOURN 8085. Problems in Journalism. 1-4 Credit.**

Individual work on chosen and specified problems not associated with the master's thesis or project. Topic must be arranged with supervising teacher prior to registration. Master's students only.

**JOURN 8090. Research in Journalism. 1-9 Credit.**

Guidance for graduate students engaged in plan A for the M.A. degree and for all doctoral candidates engaged in investigations looking toward production of thesis. Graded on a S/U basis only.

**JOURN 8092. Photography in Society. 3 Credits.**

Social and political dimensions of still photography with emphasis on critical thinking and analysis in visual communication. Prerequisite: graduate standing.

**JOURN 8098. MA Project Seminar. 1 Credit.**

Choosing and designing an appropriate profession project; preparation to carry out work successfully; discussion of trends and future directions in various areas of journalism. Must be completed before starting the professional project. Graded on S/U basis only.

**JOURN 8100. MA Thesis Seminar. 1 Credit.**

Choosing and developing an appropriate research topic for a thesis; designing a research strategy and learning appropriate investigative techniques. Must be completed before starting thesis. Graded on S/U basis only.

**JOURN 8106. The Magazine: Then and Now. 3 Credits.**

Examines magazines' history, role, economics and ethical practices, and the companies and people who produce them, particularly in the United States. It also reviews research perspectives that have illuminated this medium. Prerequisite: Journalism [JOURN] 8000.

**JOURN 8108. News Reporting and Writing for the High School Advisor. 3 Credits.**

Introduction to fundamentals of new writing. Provides training under deadline pressure in writing news stories for publication. Stories include several "live" reporting assignments.

**JOURN 8110. Editing and News Design for the High School Advisor. 3 Credits.**

Fundamentals of editing and headline writing for publication. Principles of design with emphasis on newspaper usage.

**JOURN 8120. Media Law and Ethics for the High School Advisor. 3 Credits.**

Legal concepts, including prior restraint, libel, privacy, obscenity, contempt and access as they related to print, broadcast, scholastic journalism, advertising and other areas. Includes examination of media ethics and practice.

**JOURN 8122. Graduate Proseminar for High School Advisors. 3 Credits.**

This seminar is designed to introduce students to the multiplicity of approaches to the study of journalism and mass communication. The course will focus on theories that relate to adolescents and children, plus other areas of interest to high-school educators. Restricted to students in the online College of Education Master's program for high school journalism instructors.

**JOURN 8185. Area Seminar in Journalism. 3 Credits.**

Seminar designed to accompany Journalism [JOURN] 8190, Area Problem. Through readings and discussions the master's student examines the special area related to the project.

**JOURN 8190. Area Problem in Journalism. 1-9 Credit.**

Work project enabling a master's student to demonstrate professional competence; may be one offered in a graduate reporting program or a creative project designed to meet a particular interest of student. Graded on S/U basis only.

**JOURN 9000. Doctoral Proseminar I. 3 Credits.**

First semester of a one-year course that covers theory and method in important topic areas. Each topic would be examined from several theoretical and methodological points of view. Required of doctoral students.

**JOURN 9006. Doctoral Proseminar II. 3 Credits.**

Continuation of Journalism [JOURN] 9000. Required of doctoral students.

**JOURN 9008. Readings in Journalism. 1-5 Credit.**

Directed readings for doctoral candidates. Designed to supplement work in other courses and to broaden student's knowledge of trends, interpretations and developments in the media.

**JOURN 9010. Doctoral Seminar. 3 Credits.**

This course is designed to meet the University requirement for a first-year qualifying examination process for doctoral students, involve students in research early in their programs and encourage students to recruit members of their doctoral committees.

**JOURN 9016. Advanced Seminar, Theory of Communication. 2 Credits.**

In-depth investigation of communication theory with emphasis on problems of theory building in communication. Prerequisites: Journalism [JOURN] 8056 or 8076 or instructor's consent.

**JOURN 9018. Media and Politics. 3 Credits.**

With a general premise that the mass media play a central role in American politics, this seminar seeks to answer how the class will examine various theoretical bases for that role and the ensuing political communications, the issues raised in covering American politics, and the types of effects both from politicians and from the mass media coverage on the American society.

**JOURN 9020. Risk Communication. 3 Credits.**

Designed to acquaint students from a variety of disciplines and with a variety of career goals with the scholarship of risk communication.

**JOURN 9026. Mass Communication and Cultural Theory. 3 Credits.**

Explores the relationship between mass communication and the idea of culture as it emerges during the second half of the twentieth century in the United States.

**JOURN 9085. Problems in Journalism. 1-4 Credit.**

Individual work on chosen and specified problems not associated with the doctoral dissertation or project. Topic must be arranged with supervising teacher prior to registration. Doctoral students only.

**JOURN 9087. Doctoral Research Seminar. 1 Credit.**

Weekly discussion session for doctoral students. Required of all doctoral students. Graded on S/U basis only.

**JOURN 9090. Research in Journalism. 1-9 Credit.**

Guidance for graduate students engaged in plan A for the M.A. degree and for all doctoral candidates engaged in investigations looking toward production of thesis. Graded on a S/U basis only.

## **Korean (KOREAN)**

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**KOREAN 1100. Elementary Korean I. 6 Credits.**

Introductory course on Korean language. Five hours classroom instruction with one hour lab weekly.

**KOREAN 1200. Elementary Korean II. 6 Credits.**

Five hours classroom instruction with one hour lab work weekly. Prerequisite: C- or better in Korean [KOREAN] 1100.

**KOREAN 2160. Korean Language III. 3 Credits.**

Korean III continues to build on the skills students acquired in the first-year series with increasing work in authentic materials and situations in conversation and reading that encourage students to understand the use of language in its social and cultural context. Prerequisite: Korean [KOREAN] 1200.

**KOREAN 2310. Korean Civilization I. 3 Credits.**

Focuses on understanding traditional Korean people and culture through examining social, political, economic, and belief systems. Considers

literature, art, folklore, and history up to the late 19th century. May be taken independently of Korean [KOREAN] 2320.

**KOREAN 2320. Korean Civilization II. 3 Credits.**

Considers the situation and culture of Korea at the end of the Chosun Kingdom, and the period of modernization beginning about 1876. Investigates how modernization has changed Korea by looking at attitudes, behaviors, values, philosophies, and trends of Korea in the 20th and 21st centuries. May be taken independently of Korean [KOREAN] 2310.

**KOREAN 2330. Study Tour of Korea. 3 Credits.**

Study tour allows students to experience firsthand important cultural, historical, and education aspects of Korea. Visit key landmarks, museums, and other sites. Provides information and insight needed to cultivate greater understanding of Korea. Graded on A/F basis only.

**KOREAN 3001. Topics in Korean-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing and instructor's consent; departmental consent for repetition.

**KOREAN 3005. Topics in Korean - Humanities. 3 Credits.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing and instructor's consent; departmental consent for repetition.

**KOREAN 3160. Intermediate Korean Language II. 3 Credits.**

Continues to build on the skills students acquire in the third semester of Korean language with increasing work in authentic materials and situations in conversation and reading. Encourages students to understand the use of language in its social and cultural context. Prerequisite: Korean [KOREAN] 2160, or instructor's consent.

**KOREAN 3800. Korean Economic Development and US-Korean Free Trade Agreement. 3 Credits.**

Covers introductory theories of economic development and overviews Korean historical economic development plans. Aids with understanding how South Korean achieved high levels of economic development and what policies the South Korean Government implemented to spur growth. US -Korea Free Trade Agreement is a good example of how trade promotes the achievement of development goals.

**KOREAN 3850. Religion and Culture in Modern Korea. 3 Credits.**

Survey of religious traditions and culture in Korea within a broader context of world religions: Shamanism, Buddhism, Confucianism, and Christianity, as well as new religions that have sprouted since the late nineteenth century. Intended to help students understand how religious values, ideas and practices have been integrated into the modern contemporary Korean society and culture. Discussion of how religious traditions in Korea have interacted with each other and culture. No knowledge of Korean language or culture or history required. Prerequisites: sophomore standing or instructor's consent.

**KOREAN 3890. Korean Society Through Cinema. 3 Credits.**

(Same as Film Studies [FILM\_S] 3895). Examines the way in which Korean film reveals the cultural, political, and ideological orientation of the society in which it is created and circulated. Compares films from North and South Korea, considering modernity, gender, nation-hood, and class. Prerequisite: sophomore standing. Graded on A/F basis only.

**KOREAN 4001. Topics in Korean-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing and instructor's consent; departmental consent for repetition.

**KOREAN 4005. Topics in Korean - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing and instructor's consent; departmental consent for repetition.

**KOREAN 4220. Korean Unification. 3 Credits.**

Explores many different topics related to Korean Unification. Studies North Korean ideology, political system, economic system, military, and negotiating behavior. Examines Unification policies of Koreas as well as past efforts toward Unification. Considers various scenarios of unification. Studies unification attitudes and values of Korean people including anti-American values, and the roles of neighboring countries. Junior Standing Required.

**KOREAN 4260. The Korean Diaspora in the U.S., Japan and China. 3 Credits.**

Interdisciplinary course related to the phenomenon of migration and settlement from Korea. Course seeks to deepen understanding of the ways in which Korean immigrants have shaped and continue to shape social thought as well as institutions in the United States, Japan and China. Draws upon literature, history and cultural studies to examine experiences of Koreans living in the U.S., Japan and China. Through reading critical literatures, students address issues such as immigration history, race/ethnicity, racism and resistance, gender and sexuality, culture and identity, labor, migration and globalization, class, education, religion. Sophomore standing or consent of instructor required.

## Labor Studies (LAB\_ST)

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**LAB\_ST 4301. Topics in Labor Studies. 3 Credits.**

Organized study of selected topics in labor studies. Subjects may vary from semester to semester. May be repeated to a maximum of six credit hours. Graded on A/F basis only.

**LAB\_ST 7301. Topics in Labor Studies. 3 Credits.**

Organized study of selected topics in labor studies. Subjects may vary from semester to semester. May be repeated to a maximum of six credit hours. Graded on A/F basis only. Prerequisite: graduate standing required.

## Laboratory Animal Medicine (LAB\_AN)

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**LAB\_AN 8085. Problems in Laboratory Animal Medicine. 1-99 Credit.**

Advanced studies not expected to terminate in a thesis.

**LAB\_AN 8090. Research in Laboratory Animal Medicine. 1-99 Credit.**

Research expected to terminate in a thesis. Graded on a S/U basis only.

**LAB\_AN 8450. Research in Laboratory Animal Medicine. 1-99 Credit.**

Research not expected to terminate in a thesis. Graded on S/U basis only.

**LAB\_AN 9085. Topics in Laboratory Animal Medicine. 1-99 Credit.**

Courses on various specialized topics in laboratory animal medicine or comparative medicine given on an as needed basis; content depends on faculty expertise and student need. Prerequisite: instructor's consent.

**LAB\_AN 9087. Seminar in Laboratory Animal Medicine. 1 Credit.**

Theme-oriented seminars and discussions in the field of laboratory animal medicine, comparative medicine or related areas. Prerequisite: departmental consent.

**LAB\_AN 9437. Pathology of Laboratory Animals. 4 Credits.**

Pathogenesis, pathology and diagnosis of naturally occurring diseases in animals used in research. Prerequisite: departmental consent.

**LAB\_AN 9468. Laboratory Animal Biology. 4 Credits.**

Anatomy, taxonomy, reproduction, genetics, nutrition, and behavior of common laboratory animals. Emphasis is placed on mice and rats, including genetically-engineered models with comparative discussions on other laboratory animals. Prerequisite: departmental consent.

**LAB\_AN 9469. Laboratory Animal Resource Management. 4 Credits.**

Policies, standards and regulations in the care and use of laboratory animals, including colony management, animal procurement, cost accounting, facility design, and supervisory skills. Prerequisite: departmental consent.

**LAB\_AN 9475. Methodology of Animal Experimentation. 3 Credits.**

Topics include experimental design, applied biostatistics, concepts of animal modeling. Prerequisite: departmental consent.

**LAB\_AN 9476. Grant and Manuscript Writing for Biomedical Researchers. 2 Credits.**

This course will teach students the essential steps of writing effective grant proposals and scientific manuscripts through both lecture/discussion-based and hands-on formats. Students will participate in a grant-writing exercise requiring development of individual proposals which will be reviewed by a mock study section. Prerequisite: Laboratory Animal Medicine [LAB\_AN] 9475; instructor's consent. May be repeated once for credit.

**LAB\_AN 9477. Laboratory and Project Management. 1 Credit.**

This course will provide graduates with professional development skills and career guidance including instruction in laboratory and project management. Topics will include job searching, start-up considerations, equipping a lab, personnel management and budget management. Prerequisite: enrollment in Comparative Medicine Area Program or approval of course coordinator. Graded on S/U basis only.

## Latin (LATIN)

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**LATIN 1100. Elementary Latin I. 5 Credits.**

Forms, grammar, syntax.

**LATIN 1100H. Honors Elementary Latin. 5 Credits.**

Beginning Latin for Honors Eligible students. Honors eligibility required.

**LATIN 1200. Elementary Latin II. 5 Credits.**

Continuation of Latin 1100. Prerequisite: a grade of C or higher in Latin [LATIN] 1100.

**LATIN 1200H. Honors Elementary Latin II. 5 Credits.**

Continuation of Latin 1100H. Prerequisite: a grade of C or higher in Latin [LATIN]1100. Honors eligibility required.

**LATIN 2000. Latin Reading. 3 Credits.**

Readings in Latin prose and poetry. Prerequisite: grade of C or higher in Latin [LATIN] 1200.

**LATIN 2000H. Latin Reading - Honors. 3 Credits.**

Readings in Latin prose and poetry. Prerequisite: grade of C or higher in Latin [LATIN] 1200. Honors eligibility required.

**LATIN 4300. Latin Poetry. 3 Credits.**

Readings in selections from the Latin poets. Prerequisite: Latin [LATIN] 2000 or equivalent.

**LATIN 4350. Latin Prose. 3 Credits.**

Selections from various Latin prose writers; some composition at instructor's discretion. Prerequisite: Latin [LATIN] 2000.

**LATIN 4500. Latin Stylistics. 1-3 Credit.**

Study and writing of connected prose compositions. Prerequisite: two years classical Latin or equivalent.

**LATIN 4505. Topics in Latin. 3 Credits.**

Topics course involving Latin texts. Prerequisite: Latin [LATIN] 4300 or equivalent. May be repeated for credit.

**LATIN 4510. Age of the Scipios. 3-6 Credit.**

Critical readings in and integrated analyses of the culture of the second century B.C. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4520. Age of Cicero. 3 Credits.**

Critical readings in and integrated analyses of the culture of the last decades of the Roman Republic. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4530. Vergil. 3 Credits.**

Readings, discussion, and literary analysis of Vergil's Aeneid. Prerequisite: two years of Classical Latin or equivalent.

**LATIN 4540. Augustan Literature. 3 Credits.**

Critical readings in and integrated analyses of the culture of Augustan Rome. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4550. Latin Epigraphy. 3 Credits.**

Introduction to the study of Latin inscriptions and their contributions to ancient culture. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4560. Neronian Literature. 3-6 Credit.**

Critical readings in and integrated analysis of the culture of the age of Nero. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4570. Age of Pliny and Tacitus. 3-6 Credit.**

Critical readings in and integrated analyses of the ages of Domitian and Trajan. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4580. The Theodosian Age. 3 Credits.**

A survey of major literary works of the late fourth and early fifth centuries. Readings from Augustine, Ambrose, Prudentius, Paulinus of Nola, Ammianus Marcellinus, Claudian. Prerequisite: two years of Classical Latin or equivalent.

**LATIN 4590. Medieval Latin. 3 Credits.**

Selected texts of Middle Ages and Renaissance. For students with primary interest in history, literature, philosophy, religion, Romance philology, or the classical tradition, experience with Latin sources in their field. Prerequisite: two years of Classical Latin or equivalent.

**LATIN 4600. Survey of Latin Literature. 3 Credits.**

Latin literature from origins to end of Roman Empire; emphasis on authors not covered in other courses, to provide general view of styles and genres. Prerequisite: two years Classical Latin or equivalent.

**LATIN 4960. Special Readings in Latin. 1-3 Credit.**

Readings in authors and texts not covered in other courses. Prerequisites: two years Classical Latin or equivalent.

**LATIN 7300. Latin Poetry. 3 Credits.**

Readings in selections from the Latin poets. Prerequisite: graduate standing and Latin [LATIN] 2000 or equivalent. Available to students for graduate credit in departments other than Classical Studies.

**LATIN 7350. Latin Prose. 3 Credits.**

Selections from various Latin prose writers; some composition at instructor's discretion. Prerequisite: graduate standing and Latin [LATIN] 2000. Available to students for graduate credit in departments other than Classical Studies.

**LATIN 7500. Latin Stylistics. 3 Credits.**

Study and writing of connected prose compositions. Prerequisite: graduate standing and two years classical Latin or equivalent.

**LATIN 7505. Topics in Latin. 3 Credits.**

Prerequisite: graduate standing.

**LATIN 7510. Age of the Scipios. 3-6 Credit.**

Critical readings in and integrated analyses of the culture of the second century B.C. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7520. Age of Cicero. 3 Credits.**

Critical readings in and integrated analyses of the culture of the last decades of the Roman Republic. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7530. Vergil. 3 Credits.**

Readings, discussion, and literary analysis of Vergil's Aeneid. Prerequisite: graduate standing and two years of Classical Latin or equivalent.

**LATIN 7540. Augustan Literature. 3 Credits.**

Critical readings in and integrated analyses of the culture of Augustan Rome. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7550. Latin Epigraphy. 3 Credits.**

Introduction to the study of Latin inscriptions and their contributions to ancient culture. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7560. Neronian Literature. 3-6 Credit.**

Critical readings in and integrated analysis of culture of the age of Nero. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7570. Age of Pliny and Tacitus. 3-6 Credit.**

Critical readings in and integrated analyses of the ages of Domitian and Trajan. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7580. The Theodosian Age. 3 Credits.**

A survey of major literary works of the late fourth and early fifth centuries. Readings from Augustine, Ambrose, Prudentius, Paulinus of Nola, Ammianus Marcellinus, Claudian. Prerequisite: graduate standing and two years of Classical Latin or equivalent.

**LATIN 7590. Medieval Latin. 3 Credits.**

Selected texts of Middle Ages and Renaissance. For students with primary interest in history, literature, philosophy, religion, Romance

philology, or the classical tradition, experience with Latin sources in their field. Prerequisite: graduate standing or instructor's consent.

**LATIN 7600. Survey of Latin Literature. 3 Credits.**

Latin literature from origins to end of Roman Empire; emphasis on authors not covered in other courses, to provide general view of styles and genres. Prerequisite: graduate standing and two years Classical Latin or equivalent.

**LATIN 7960. Special Readings in Latin. 2-3 Credit.**

Readings in authors and texts not covered in other courses. Prerequisites: graduate standing and two years Classical Latin or equivalent.

**LATIN 8000. Proseminar in Latin Texts. 3 Credits.**

Prerequisite: graduate status or instructor's consent.

**LATIN 8010. Latin Rough Guide. 3 Credits.**

Intensive exploration of Latin literature from the Roman Republic through the Late Empire. Emphasis upon texts as both literary and cultural artifacts whose interpretation requires familiarity with the historical and archaeological legacy of antiquity as well as modern exegetical strategies.

**LATIN 9187. Seminar in Roman Comedy. 3 Credits.**

Prerequisite: graduate standing.

**LATIN 9287. Seminar in Latin Lyric and Elegiac Poetry. 3 Credits.**

Prerequisite: graduate standing.

**LATIN 9387. Seminar in Neronian Literature. 3 Credits.**

Prerequisite: graduate standing.

**LATIN 9487. Seminar in Roman Historians. 3 Credits.**

Prerequisite: graduate standing.

**LATIN 9587. Seminar in Latin Epic Poetry. 1-99 Credit.**

Prerequisite: graduate standing.

**LATIN 9687. Seminar in the Augustan Age. 3-6 Credit.**

Integrated studies in the culture of the age of Augustus--its literature, art and architecture, religion, political and social institutions. Prerequisite: graduate standing.

**LATIN 9787. Seminar in Late Antiquity. 3 Credits.**

Integrated studies in the culture of late antiquity with interdisciplinary focus. Prerequisites: graduate standing or instructor's consent.

**LATIN 9887. Seminar in Special Fields. 3 Credits.**

Prerequisite: graduate standing.

## Law (LAW)

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**LAW 5010. Civil Procedure I. 1-3 Credit.**

Fundamental and recurrent problems in civil actions in federal and state courts; remedies; pleading; discovery; trials; jurisdiction; appeals; joinder; preclusion.

**LAW 5015. Civil Procedure II. 1-3 Credit.**

Continuation of Law 5010.

**LAW 5020. Contracts I. 1-3 Credit.**

Contract formation, insufficient and defective agreement, bases of promissory liability (including consideration and promissory estoppel), resolution, and abuse of bargaining process, Statutes of frauds, parole evidence rule and principles of interpretation, contract performance and risk allocation, remedies for breach.

**LAW 5025. Contracts II. 1-3 Credit.**

A continuation of Law 5020.

**LAW 5035. Criminal Law. 1-4 Credit.**

The purposes of criminal law; nature of criminal responsibility; characteristics of particular crimes.

**LAW 5050. Property. 1-5 Credit.**

Classification of real and personal property; rights to found goods; bailments; possession and adverse possession; estates in land and future interests; concurrent ownership; Landlord and tenant; easements, profits and licenses; covenants running with land and equitable servitudes; contracts for the sale of land; conveyancing.

**LAW 5070. Torts. 1-5 Credit.**

Principles and practices governing recovery of damages for injuries to person or property. Defamation invasion of privacy dignitary wrongs, products liability, fraud liability insurance, immunities and a survey of various "no fault" proposals.

**LAW 5080. Legal Research and Writing. 1-2 Credit.**

An introduction to the basics of legal research (using print materials), legal citation and legal writing. Each student writes two objective office memoranda, and a client letter.

**LAW 5085. Advocacy and Research. 1-3 Credit.**

An introduction to Computer Assisted Legal Research, written advocacy, oral advocacy, and the Missouri rules of appellate procedure. Each student writes a trial court motion and brief and then argues that motion. Each student also writes an appellate brief and presents an oral argument in the First Year Moot Court Competition directed by the Board of Advocates (BOA).

**LAW 5090. Legal Reasoning. 1-2 Credit.**

A limited enrollment course designed to assist first-year students to better understand the legal system, prepare for examinations and improve their legal analysis and reasoning skills. Graded on S/U basis only.

**LAW 5095. Lawyering: Problem Solving and Dispute Resolution. 1-2 Credit.**

This course is designed to provide students in introduction to critical lawyering skills; to give students an overview of the alternative processes that a lawyer can employ to resolve a client's problem; and to offer students an understanding of the lawyer's role as a problem solver. It includes an introduction to Interviewing, Counseling, Negotiation, Mediation, Arbitration, mixed dispute resolution processes and ways to choose or build dispute resolution process.

**LAW 5220. Constitutional Law. 1-4 Credit.**

Study of theories of judicial review and justiciability; sources of federal legislative power, commerce, taxing, spending, treaty, presidential, military powers; power of states to regulate and tax interstate commerce; preemption; state actions doctrine; due process, equal protection, First Amendment rights.

**LAW 5240. Criminal Procedure. 1-3 Credit.**

Constitutional and other limitations placed upon law enforcement officers and prosecutors.

**LAW 5260. Evidence. 1-4 Credit.**

The basic law of evidence; use in trials, relevancy, circumstantial proof and real proof; use of witnesses, methods of examination; presumptions and burden of proof; functions of judge and jury.

**LAW 5280. Professional Responsibility. 1-3 Credit.**

Responsibilities of lawyer to client, courts and the public. Topics include: organization of the legal profession, fees, conflicts of interest, the confidential relationship, advertising and solicitation, unauthorized practice and courtroom behavior.

**LAW 5310. Administrative Law. 1-3 Credit.**

(same as Public Administration 8864). Administrative Law is concerned with the process government agencies used to make decisions. As such it develops the requirements for establishing rules and policies. It also covers the means by which regulations and statutory provisions are enforced by agencies, and the means for securing judicial review of rules and enforcement actions.

**LAW 5311. Adoption, Assisted Reproductive Techniques and Guardianship. 1-3 Credit.**

This course covers history of adoption, procedure in modern instate and interstate adoptions, inter country adoption, who may adopt, confidentiality in adoption, post adoption disputes, procedure under the Indian Child Welfare Act and the Interstate Compact for Placement of Children, ARTs (assisted reproductive techniques), guardianship, and payment of money in adoption and collaborative reproduction.

**LAW 5313. Collateral Consequences of Sentencing. 1-3 Credit.**

This class will examine the collateral consequences of sentencing. In three-parts, the course will examine sentencing the consequences associated with sentencing (i.e. deprivations and disabilities that an offender encounters), and the process of restoration and reentry for offenders following their sentences. Given the scope of offenses and sentences, the courses will focus exclusively on felonies and the consequences from such convictions. Part I will provide students with a brief overview of sentencing history and its reform. Part II will focus on the plethora of deprivations and disabilities that offenders encounter upon being sentenced for a felony. And finally, Part III will discuss the various methods and processes for an ex-offender to regain their rights.

**LAW 5320. Advanced Legal Research. 1-2 Credit.**

Skill training in advanced research techniques and resources used in law practice. Designed to help students become critical legal information consumers with emphasis on developing effective, cost-efficient research strategies. Topics include advanced litigation research, legislative and regulatory history, audience research, research in transactional practices areas, and research in other practices areas including legal ethics, public interest law, and international law. In-depth practice with Lexis, Westlaw and free Internet sources, including appropriate and effective use of social networking tools to extend research.

**LAW 5321. Advanced Legal Writing. 1-3 Credit.**

This course is designed to help students to think purposefully about the process of writing and to practice writing and editing in a disciplined way. Students will do exercises involving rhetorical techniques, grammar, punctuation, and word usage. Students also will rewrite of portions of appellate briefs or judicial opinions to emphasize a particular technique, or critique briefs or opinions to do so.

**LAW 5323. Advanced Torts: Dignitary and Economic Torts. 1-3 Credit.**

The Advanced Torts: Dignitary and Economic Torts class will examine dignitary and economic torts covering but not limited to such topics as: defamation, invasion of privacy, tortious interference, misrepresentation and injurious falsehood. Unlike tortious conduct that results in an individual suffering physical harm or contact, the claims that arise from these torts represent one of two kinds of non-physical injury -

independent dignitary that are similar to or include emotional harms or independent economic or commercial harms. The purpose of the course is to provide students with an opportunity to explore tortious conduct and remedies available that are omitted typically from the First Year Torts course.

**LAW 5325. Advanced Trial Practice. 1-3 Credit.**

This course will expand student knowledge of opening statements, direct/cross examination witnesses, jury instruction, closing arguments and will focus significantly on the examination/cross examination of expert witnesses. Grading is based on student participation in examination of witness and semester-ending written trial brief. Prerequisites: Evidence; Trial Practice.

**LAW 5327. Advertising and Marketing Law. 1-3 Credit.**

This course will cover the regulation of false and misleading advertising under the Lanham Act, the FTC Act and state consumer protection laws. Students will examine advertising and analyze what claims are being made and whether those claims are false or misleading under applicable law. Students will examine the procedures available for competitors, the government and consumers to challenge false or misleading advertising and the remedies available through those procedures.

**LAW 5330. Advocacy, Family Violence and Public Policy. 1-2 Credit.**

Interdisciplinary presentations examine both the state of family violence in America and the cross disciplinary issues in effective intervention, including legal procedures. The seminar is open to 2nd or 3rd year law students and other professional graduate students with permission of the faculty. (Not available to students on probation, except for students classified as 3L students).

**LAW 5332. Advocacy and Government Agencies. 1-3 Credit.**

This course will begin with a brief review of the structure of government: what the various programmatic tools (such as different type of regulation and the delivery of services) are, when they are use, how they work, and why. It will look at how to advocate you cause before agencies, such as informal contacts, formal submittals, and the role of scientific and economic information. We will review the increasing use of the web and what it means for interacting with agencies. It will look at how agencies are managed and the reviews inside the government to ensure "quality" decisions. It will look at the ethical requirements on government employees and their effects on advocacy. It will also look at restrictions on the outside, with a brief review of the law of lobbying. A good portion of the class will be practical advocacy before agencies and how to challenge agency actin in court. We will also talk about the role of the President (or governor) and Congress (or the legislature) in achieving your goal before an agency. A general familiarity with Administrative Law is critical. Thus, a course in Administrative Law (5310) or its equivalent is required as a prerequisite.

**LAW 5335. Agricultural Law. 1-3 Credit.**

Economic and legal aspects of agricultural problems will be analyzed, along with the implications of alternative proposals. The agricultural issues to be covered include statutory restrictions on farmland ownership.

**LAW 5337. American Legal History to 1876. 1-3 Credit.**

This is a revision of Legal History. The course covers such topics as the impact of the English common law heritage; the development of law in the American colonies; slavery, race and gender in nineteenth century America. The course ends with the conclusion of the Civil War. The course will explore the effects of historical events on the development of law, but the course does not presume prior study of American history.

**LAW 5338. American Legal History from 1876. 1-3 Credit.**

Historical study of the development of American law since the Civil War. The course will cover such topics as the Civil War amendments to the Constitution; Reconstruction and its aftermath; legal change during the rise of industrialism; race and gender in late 19th century and 20th century America; law in the Progressive Era; the growth of civil liberties and civil rights in the Supreme Court; the law during war and the Depression; jurisprudential trends; and the Civil Rights Movement of the 1960s. The course will explore the effects of historical events on the development of law, but the course does not presume prior study of American history.

**LAW 5340. Antitrust Law. 1-3 Credit.**

Introduces antitrust and economic analysis and the role of competition, with emphasis on price fixing, horizontal and vertical restraints of trade, monopoly and merger problems.

**LAW 5345. Appellate Advocacy. 1-3 Credit.**

Enhances skills training for the preservation and presentation of matters on appeal. In addition, an introductory examination of extraordinary remedies (as a complement to appeal) and other unique actions filed in the Supreme Court of Missouri.

**LAW 5350. Arbitration. 1-3 Credit.**

Law, policy and practices relating to arbitration process as it is utilized in commercial and international sectors. Topics include modern arbitration statutes (e.g., the Federal Arbitration Act), enforceability of agreements to arbitrate, public policy defenses against enforcement of arbitration agreements, arbitrators and administering institutions, components of the arbitral process, arbitral remedies and awards, and the arbitration award in the courts.

**LAW 5360. Banking Law. 1-3 Credit.**

This course will review the current banking structure in the United States. The course will focus on the regulatory framework in which banks operate, including types of charters, permitted activities, capital structure and reporting requirements. The course will integrate changes enacted in regulatory reforms mandated by the Dodd-Frank Regulatory Reform Act of 2010, as well as new capital requirements that may be imposed by international agreements (Basel III).

**LAW 5365. Bankruptcy. 1-3 Credit.**

Focuses on rights of both secured and unsecured creditors under state and federal law. State law covers collective actions and such individual actions as execution, attachment, garnishment, and the law of fraudulent conveyances. Federal law concentrates on liquidation proceedings under Chapter 7 of the Bankruptcy Code and reorganizations for wage earners under Chapter 13 of the Code. Includes, as time permits, an introduction to the business reorganization provisions of Chapter 11.

**LAW 5370. Basic Business Principles for Lawyers. 1-3 Credit.**

This course is designed for students who want to understand the language and practices of business regardless of whether they contemplate being a business lawyer or not. All lawyers, regardless of their specialty, regularly encounter the language and concepts of business. The purpose of the class is to provide law students with little or no business knowledge or background with the information they need to practice law effectively in a business environment. This class is intended to educate students to be comfortable with business concepts regardless of their prior background. So liberal arts undergraduates should feel comfortable taking this class.

**LAW 5375. Basic Federal Income Taxation. 1-4 Credit.**

Federal income tax problems of individuals taxpayers; nature of income; when and to whom income is taxable; exclusion from tax base; deduction; tax effects of exchange or other disposition of capital assets. This course is designed to introduce students to the income tax considerations that arise in a variety of legal contexts and will benefit even those students not planning to pursue a career in tax.

**LAW 5380. Bioethics Seminar. 1-3 Credit.**

An examination of some of the legal and ethical issues presented by modern medical science, such as the redefining of death, the withholding or refusal of life-sustaining medical treatment, reproductive technology (which raises issues such as paternity, custody, safety and access), organ transfer, genetic counseling and the public health issues raised by the AIDS epidemic. (Not available to students on probation, except for students classified as 3L students).

**LAW 5385. BOA Competition. 1 Credit.**

While this is a late summer moot court competition directed by the Board of Advocates. The competition is open to 2Ls and 3Ls, but only 2Ls can advance to the final rounds. Students receive an assignment in the spring, submit their written appellate briefs at the end of July, and participate in oral arguments at the beginning of fall semester. The top six 2L competitors present their final arguments in Jefferson City before Missouri Supreme Court judges. These finalists are invited to represent the law school during the following academic year as members of our regional teams for the National Moot Court Competition. Regional team members must enroll in Moot Court I and Moot Court II. Prerequisite: LAW 5085. Graded on S/U basis only.

**LAW 5395. Business Organizations. 1-4 Credit.**

The law schools foundation course in business law; recommended for students in all areas of interest. Course coverage includes the study of agency, partnership, limited partnerships, limited liability partnerships, limited liability companies, and corporations. This course is a prerequisite for several advanced electives in business law.

**LAW 5410. Children and the Law. 1-3 Credit.**

This course covers the status, rights and obligations of children in contemporary American law; civil proceedings and criminal prosecutions alleging child abuse or neglect; foster care; termination of parental rights; juvenile protective legislation; and delinquency. Emphasis is placed on juvenile justice doctrine, policy and practice issues and the historical and contemporary operation of juvenile and family courts.

**LAW 5415. Constitutional and Civil Rights Litigation. 1-3 Credit.**

Advanced analysis of protection of civil liberties that derive from the United States Constitution and federal statutes. The statutes which will be covered most extensively include the Reconstruction Era laws now codified at 42 U.S.C. section 1981, 1983 and 1985, Rehabilitation Act of 1973, Titles IX of the Educational Amends. of 1972, and Titles II and VI of the Civil Rights Acts of 1964.

**LAW 5420. Client Interviewing and Counseling. 1-3 Credit.**

This course covers the nature and conduct of counseling process including basic interviewing techniques, psychological factors affecting the interview process, facilitating and structuring the interview, clarification of statements and ascertaining legal issues, and dealing with client resistance and hostility. Graded on S/U basis only.

**LAW 5425. Clinical Skills. 1-4 Credit.**

Skills training for students enrolled in the criminal clinic. Lectures and simulations designed to facilitate student skills in case preparation and presentation and client representation: ethical concerns, fact

investigation, interviewing and counseling, drafting legal documents, direct and cross exam, making and responding to objections. (Not available to students on probation).

**LAW 5430. Commercial Real Estate Leasing. 1-3 Credit.**

Seminar course that involves the study of selected topics involved in the negotiation, drafting, and Interpretation of commercial real estate leases. These topics will include (among others): rental provisions, defining the premises, use of the premises, condition of the premises, assignments and subleases, maintenance and repairs, casualty, insurance, default/remedies, and collateral lease documentation. The course focuses upon the various parties involved in the process of commercial real estate leasing, their respective interests, and the dynamics of the negotiation and drafting process in which these parties memorialize their respective interests in the lease document. There is heavy focus upon the careful reading, review, negotiation and revision of the lease document. Grading is based upon a series of exercises involving document review, negotiation, and drafting, and includes both individual and group work.

**LAW 5435. Comparative Law. 1-3 Credit.**

This course examines differences and similarities between the major legal systems of the world, focusing on distant areas of substantive and procedural law to demonstrate diverse methods of addressing similar legal issues. The course includes a discussion of the historical distinctions between the common and civil law traditions but also moves the analysis forward to address more recent legal innovations and the recognition of new groupings of legal systems. Students will leave the class with a solid understanding of (1) how U.S. legal principles compare to approaches used elsewhere and (2) the uses and benefits of the comparative approach. Principles taught in this course will be equally applicable to those who anticipate practicing domestic U.S. law as well as those who expect to develop an international practice. No foreign language skills are necessary for this course.

**LAW 5440. Complex Litigation. 1-3 Credit.**

Will examine principles and practical techniques relevant to complex civil cases. Building on civil procedure, the course will focus on litigation involving multiple parties and/or multiple jurisdictions. Each student will be required to complete several drafting assignments. Course may be repeated for credit. Prerequisite: Civil Procedure.

**LAW 5445. Conflict of Laws. 1-3 Credit.**

Study of how disputes, and transactions are affected by having contacts with more than one jurisdiction. The three principal areas of study are: Where can suit be brought? What law will be applied? What will be the effect of any judgment?.

**LAW 5450. Conflict and Conflict Management. 1-3 Credit.**

This course is designed to give lawyers a better understanding of the meaning and dynamics of conflict, so that they may better understand their client's situations, as well as the mechanisms that may be most appropriate to the resolution of any particular dispute. Course draws its theoretical teachings from a variety of disciplines beyond law: psychology, sociology, anthropology and economics. This course is also open to Journalism students.

**LAW 5451. Constitutional Faith. 1-3 Credit.**

Justice Hugo Black famously described his commitment to the Constitution as a "constitutional faith." The civil religion of the Constitution may well be the country's most widely held faith. This seminar explores the many meanings—and the dilemmas—of Americans' constitutional faith. We will begin by considering the Constitution's status as a "sacred text," one that performs the same sort of public functions in American life

that the Bible performed for western democracies in earlier centuries: binding together the populace and giving citizens a shared sense of meaning. We will begin by considering the Constitution's status as a "sacred text," one that performs the same sort of public functions in American life that the Bible performed for western democracies in earlier centuries: binding together the populace and giving citizens a shared sense of meaning. From there we will turn to a series of interlocking questions that the Constitution's sacred status poses: What, precisely, is the Constitution? Is it the test - or tradition- or something else? Who has authority to interpret the Constitutions (whatever it is)? Does it deserve veneration - or is it in fact flawed or inefficient or even immoral? Finally, how should one read the Constitution we have? Students will ultimately be asked to decide whether "constitutional faith" is really worth embracing. We will explore these questions together in a discussion-based format, drawing on readings from the fields of law, political science, and religion. There are not prerequisites for this seminar. Class attendance and participation is mandatory, and will account for 30 percent of the final grade. The remaining 70 percent will be based on a seminar paper, at least twenty pages in length, on a topic of the student's choosing (with instructor approval). This class will satisfy the writing requirement.

**LAW 5452. Constitutional Litigation. 1-3 Credit.**

This course will focus on federal constitutional adjudication from the viewpoint of the litigator and the law clerk with a view towards (among other things) preparing students for federal and state clerkships. Students will consider specific substantive questions of constitutional law currently pending before the Supreme Court. They will each argue two cases taken from the Supreme Court docket; participate in oral arguments as guest judges; write one petition for certiorari from an Eighth Circuit case; and draft a Supreme Court brief. Students will have an opportunity to argue at the Missouri Supreme Court before sitting Supreme Court Judges.

**LAW 5454. Contract Drafting. 1-3 Credit.**

Course teaches students the principles of drafting commercial agreements. Although the course will be of particular interest to students pursuing a corporate or commercial law career, the concepts are applicable to any transactional practice. Students will learn how transactional lawyers translate business deals into contract provisions, as well as techniques for minimizing ambiguity and drafting with clarity. Through a combination of lecture, hands-on drafting exercises and extensive homework assignments, students will learn about different types of contracts, other documents used in commercial transactions, and the drafting problems that contracts and other documents present. Course will also focus on how a drafter can add value to a deal by finding, analyzing and resolving business issues. Grades will be based on the graded assignments, good faith completion of the ungraded assignments, and class participation.

**LAW 5455. Copyright Law. 1-3 Credit.**

Nature of copyright law; common law misappropriation; scope of common law copyrights; Copyright Revision Act of 1976 as amended; formalities of registration (fixation, copyright notice): copyrightable subject matter; originality; exclusive rights of copyright owner; scope of copyright protection; substantial similarity and infringement; fair use; joint and composite works; duration, renewal, termination, transfer; remedies; artists moral rights; federal preemption; international protection; copyrightability of computer software; copyright issues on the internet.

**LAW 5460. Corporate Finance. 1-3 Credit.**

Legal principles of corporate finance, including: considerations of capital structure; characteristics of various types of corporate securities;



mechanics of securities issuance; principles of contract interpretation applied to securities; application of basic principles of fiduciary obligations in issuers having outstanding multiple classes of securities and in transactions affecting finance; distributions in respect of securities; as time permits, basic principles of valuation for legal purposes. This class is not duplicative of a class in the economics of corporate finance; and prior study of the economics of corporate finance is not a prerequisite. Prerequisite: LAW 5395 or professor's consent. Students cannot enroll concurrently in Corporate Finance and Deal Skills. Students who have completed Deal Skills and precluded from enrolling in Corporate Finance. However, students are allowed to enroll in Deal Skills even if they have already taken Corporate Finance.

**LAW 5465. Corporate Taxation. 1-3 Credit.**

This course will provide an in-depth study of the federal income taxation of corporations and their shareholders, including the tax aspects of forming and capitalizing a corporation, corporate distributions, redemptions, and taxable and tax-free corporate liquidations. This course will be taught using the problem methods of instruction. Prerequisite: LAW 5375. Must have taken or be currently enrolled in LAW 5325.

**LAW 5470. Criminal Clinic. 1-5 Credit.**

The Criminal Clinic is available during both the Fall and Winter semesters. It can only be taken once. Enrollment is limited to 8 students per semester. Students must also enroll in Clinical Skills and Criminal Clinic Writing Project and have completed, or be enrolled in, Professional Responsibility. Students must have prior permission of Professor Johnson to enroll. The companion Criminal Clinic Writing Project course will be graded but does not fulfill the "writing" requirement for graduation. (Not available to students on probation).

**LAW 5475. Criminal Clinic Writing Project. 1-2 Credit.**

This is the Writing Section accompanying course 5470.

**LAW 5477. Criminal Justice Administration. 1-3 Credit.**

This course will examine the justice system's processing of formal criminal cases from the point at which a defendant is formally charged forward. In other words, it will be a "procedure" course reviewing the processing and adjudication of criminal cases. Topics might include the defendant's rights under the Sixth Amendment (including jury trial, speedy trial, confrontation clause, and compulsory process rights), Eighth Amendment issues (including bail and cruel and unusual punishment), criminal discovery (including the prosecutor's Brady obligation to provide exculpatory evidence to defendants and notice requirements for alibi and insanity defenses), expert witnesses, pretrial and trial publicity, plea bargaining, sentencing (under discretionary, guidelines, and minimum mandatory systems), criminal appeals, and post-conviction relief (habeas corpus, pardons, and commutations). The course may also review advanced topics in the substantive criminal law, including such issues as fraud, other white collar crimes, conspiracy, and the expanding federal presence in investigation, prosecution, and incarceration. In other words, this will be both an advanced criminal procedure course (similar to "bail to jail" courses at other law schools) and an advanced criminal law course. It is strongly recommended that students successfully complete both Criminal Law and Criminal Procedure before taking this course.

**LAW 5480. Criminal Litigation Skills. 1-3 Credit.**

This skills course concentrates on the pretrial process in the criminal justice system. Topics include attorney-client decision making, interviewing, counseling, plea bargaining and voir dire.

**LAW 5485. Cross-Cultural Dispute Resolution. 1-3 Credit.**

The course will focus on the impact culture can have on the private ordering of disputes. Culture affects communication, perceptions regarding conflict and methods for resolution. As the world becomes more interrelated and Missouri and the U.S. more diverse, lawyers need to be prepared to resolve problems across cultural lines. 20-25% of the grade will come from timely attendance and class participation.

**LAW 5496. Deal Skills Class. 1-3 Credit.**

Introduces students to business and legal issues common to commercial transactions. Class will emphasize the thought process involved in, and required by, the practice of transactional law, skills as interviewing, counseling and communicating with your client, understanding business issues and drafting contract provisions to reflect those issues, negotiation deals and managing a transaction closing. Simulation exercise, in-class role-play and lectures, out-of-class due diligence, negotiation and other exercises. Prerequisite: Business Organization. Students cannot enroll concurrently in Corporate Finance and Deal Skills. Students who have completed Deal Skills are precluded from enrolling in Corporate Finance. However, students are allowed to enroll in Deal Skills even if they have already taken Corporate Finance.

**LAW 5497. Death Penalty Law. 1-3 Credit.**

The primary focus of this course will be on the Supreme Court's capital punishment jurisprudence over the past 35 years, with particular attention to how it has shaped state statutory schemes and legal argumentation in capital sentencing trials.

**LAW 5520. Drafting of Legal Instruments. 1-2 Credit.**

Problems frequently encountered in general office practice (land transfers, mortgages, leases, contracts, wills, business organizations, etc.), with drafting of the related instruments. Use and adaptation of legal forms. S/U graded only.

**LAW 5525. Education Law. 1-3 Credit.**

This course examines the application of discrete doctrines from criminal law, constitutional law, juvenile law, employment law, and disability law to the legal problems facing American schools. Students will explore the ways in which the objectives of these discrete legal doctrines either promote or interfere with our educational policies. Substantive areas of concentration include state regulation of education; freedom of speech, association and religion; equal educational opportunity; employment of teachers; and discipline of students.

**LAW 5526. Education Reform Law. 1-3 Credit.**

This class will explore the many legal and policy issues raised by efforts to reform American K-12 education. We will look at legislative proposals such as No Child Left Behind, Race to the Top, alternative teacher certification rules, penalties for failure to improve the performance of subgroups, authorization of charter schools and vouchers, expanded access to state-funded pre-K, fairer funding formulas, and expanding racial and economic integration through school attendance policies.

**LAW 5530. Elder Law. 1-3 Credit.**

This course address legal issues impacting older individuals, including discussion of government benefits (Social Security, Medicaid, Medicare, Supplemental Security Income), long-term care (types, contract issues, civil rights, and financial planning), guardianship and conservatorship, planning for incapacity, and health care decisions at the end of life. The course emphasizes planning techniques for the average client. Grade will be based on a short paper and take-home exam. The course may be taken for writing credit.

**LAW 5532. Election Law. 1-3 Credit.**

Election Law has become more important in recent years. This course will introduce students to the many theoretical and practical constitutional, statutory, common law, and policy issues that accompany the franchise, including: legislative districting, voting rights, campaign finance, political parties, interest groups, direct democracy, and alternative democratic structures. The course will emphasize federal law, but will also address Missouri state law as appropriate.

**LAW 5534. Electronic Discovery. 1-3 Credit.**

This course provides an in-depth treatment of the legal, technical, and cost management issues involving electronically stored information ("ESI") in civil litigation. Covers the 2006 FRCP ESI amendments (Rules 26 meet and confer, 34, production, and 37 sanctions), FRE 502 (privilege review and production), state e-discovery rules, the rapidly developing ESI case law, and emerging best practices from the Sedona Conference Cooperation Proclamation, the Electronic Discovery Reference Model, and other E-discovery authorities. Practice drafting litigation holds, preservation orders, and related e-discovery documents regularly used in civil litigation. Grading is based on student projects and a final examination.

**LAW 5537. Emotional Intelligence in Law. 1-3 Credit.**

Success in law requires more than substantive legal knowledge. It also requires self-awareness, or "emotional intelligence," by the lawyer in order to be able to operate effectively in a complex and nuanced legal environment. This course is designed to help students develop their emotional intelligence by cultivating such personal and social competencies as personal and social awareness, understanding of motivation, empathy and social skills.

**LAW 5540. Employment Discrimination. 1-3 Credit.**

This course examines the laws which prohibit discriminatory practices in employment. Title VII is the primary focus, but coverage is also given to the Equal Pay Act, the Americans with Disabilities Act, and the Age Discrimination in Employment Act. Additionally, the course addresses the administrative process available for dealing with employment discrimination complaints, the prima facie case requirement and burden shifting analysis fused in civil rights cases, and affirmative action requirements.

**LAW 5543. Employment Law. 1-3 Credit.**

Employment Law focuses on the legal relationship between employers and employees in the non-unionized workplace. The course will survey a variety of issues regarding the establishment, maintenance and termination of the employment relationship. For example, the course will cover the common law aspects of that relationship, particularly contracts and torts. It will examine statutory modifications of the common law in areas such as wage and hours, pensions, whistle-blower protection, unemployment insurance, workers compensation, and health and safety.

**LAW 5545. Environmental Law. 1-3 Credit.**

Federal and state regulation of the environment, including the economic and philosophical foundations of environmental regulation, the common law roots of environmental regulation, and substantive coverage of a number of environmental statutes, such as the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, National Environmental Policy Act, and Endangered Species Act. Prerequisites: Estates and Trusts; Basic Federal Income Taxation (Estate Planning report suggests this course as co-requisite; Tax Group report suggests this course as prerequisite).

**LAW 5555. Estate Planning and Taxation. 1-4 Credit.**

This is a tax-oriented planning course, including discussion of federal estate and gift tax, income taxation of estates and trusts, and techniques for transferring property of a minimal tax cost both during life and at death. Grade will be based on the preparation of one or more projects. Prerequisites include LAW 5560 and 5375.

**LAW 5560. Estates and Trusts. 1-4 Credit.**

Wills: probate process and will contests, intestate succession; restrictions on testation; execution, revival of wills; integration, incorporation by reference, events of independent significance; will substitutes; will construction; family protection.. Trusts: elements and creations; modification and termination; beneficial interests; charitable trusts; trust construction; powers of appointment; trust administration and fiduciary duties.

**LAW 5565. European Union Law. 1-3 Credit.**

Introduction to the law of the European Union. Emphasis will be on the "constitution" of the Union: treaty structure, institutions including the European Court of Justice and its jurisdiction, relationship of EU law and institutions to those of Member States, and the role of the EU in external relations. Substantive topics include the four freedoms (free movement of goods, persons, services and capital among the Member States), competition policy, and harmonization of laws; others may include environmental protection social policy, gender equality and monetary union.

**LAW 5570. Externship. 1-3 Credit.**

The Externship offers students an opportunity to develop the skills necessary to bridge the gap between law school and law practice. Through the Externship, students prepare for "effective and responsible participation in the legal profession" (ABA std. 301) by applying the core concepts learned in law school courses to the challenges presented in the actual, in-office practice of law. Details concerning the requirements and structure of the course are available at the Externship webpage. Students cannot take more than 6 hours of Externship credits. Credits earned in the Landlord/Tenant Practicum count toward that 6-hour Externship limit.

**LAW 5572. Fair Housing. 1-3 Credit.**

The goals of this course are (1) to provide students with a conceptual framework for understanding the different forms that housing discrimination can take and how such discrimination affects our society, and (2) equip students with practical tools for analyzing and litigating fair housing cases. The course will focus primarily on the Federal Fair Housing Act of 1968, and the Fair Housing Amendments Act of 1988. We will examine the Fair Housing Act, its legislative history, early case law, and the development of the basic doctrine. We will progress to the "modern" era of fair housing law, after the Fair Housing Amendments Act added disability and familial status as protected classes. We will explore the ways in which the concept of what constitutes "housing discrimination" has expanded, and how the law has developed accordingly. For example, we will discuss sexual harassment in housing, and the requirements that new multifamily housing be built so that it is accessible to persons with disabilities. In addition, the course will cover more systematic ways in which housing discrimination can manifest itself, such as through municipal land use and zoning decisions, and the mortgage lending practices of financial institutions (including discriminatory refusals to lend, redlining, and predatory lending). In addition to these doctrinal issues, the course will cover the private and public enforcement mechanisms of the Act; theories of liability (including disparate treatment, disparate impact, and failure to reasonably

accommodate); damages; and issues of proof (including the uses of statistical and testing evidence).

**LAW 5575. Family Law. 1-3 Credit.**

After surveying the variety of family arrangements in contemporary America and central issues concerning the practice of domestic relations law, this course covers marriage; dissolution; distribution of marital property; alimony; child custody; visitation and support; post-dissolution disputes over custody and child-rearing; non-marital families and non-marital children; private agreements in family law; and alternative dispute resolution in collaboration with other professions in client representations, and ethical and policy issues.

**LAW 5577. Family Law Dispute Resolution. 1-3 Credit.**

This course involves students performing simulations of litigation and non-litigation dispute resolution procedures used in family law cases. The course begins with discussion of family dynamics (including issues such as child development and domestic violence), the family court system, and distinctive professional challenges for family lawyers. Exercises involve procedures such as interviewing clients, screening for domestic violence, working with other lawyers, engaging child custody evaluators and parenting coordinators, conducting and defending depositions, preparing for and conducting negotiation and mediation, arguing contested motions in court hearings, and drafting settlement agreements and court orders. Prerequisite: Law [LAW] 5575- Family Law.

**LAW 5580. Family Violence Clinic: Individual and Social Justice. 1-4 Credit.**

Rule 13 certified law students represent needy abused women and children in 13 rural Missouri counties. Students obtain orders of protection in adult abuse courts, and students appear in protective custody cases in juvenile courts. Weekly briefings may include interprofessional graduate students. Law students must complete 580L before or during their clinical experience.

**LAW 5584. Fiduciary Administration. 1-3 Credit.**

This course will cover key issues that arise in the administration of decedent's estates and trusts, including the necessity for probate, rights of creditors, the fiduciary obligations of trustees and personal representatives, investments, and accountings and distribution. Depending on class size, grading will be based either on an exam, a practice-oriented project, or both.

**LAW 5585. Federal Courts. 1-3 Credit.**

The role of federal courts and their relationship to state courts. Topics covered: justiciability; federal question and diversity jurisdiction, sovereign immunity; abstention; and habeas corpus.

**LAW 5589. The Fourteenth Amendment. 1-3 Credit.**

This course will build on Constitutional Law I by focusing on the constitutional revolution achieved by the Fourteenth Amendment. The course will begin by exploring the passage of the Amendment and its early interpretation, before turning to focus on the development of modern due process and equal protection law. Topics to be covered include incorporation, substantive due process and the right to privacy, race and gender equality, fundamental rights, and state action doctrine. Students will also be introduced to Section 5 questions regarding the scope of Congress' ability to enforce the Amendment.

**LAW 5590. Freedom of Speech and Association. 1-3 Credit.**

A study of the rights of speech and association under the First Amendment of the United States Constitution. Major Supreme Court decisions regarding freedom of speech, including content-based and content-neutral restrictions of speech, regulation of commercial speech,

regulation of obscenity and pornography, regulation of speech in public and private fora, libel and privacy law, forced association with persons or ideas, and subsidization of speech.

**LAW 5591. Food Law and Policy. 1-3 Credit.**

This course examines the laws that govern food safety and food labeling and considers how well this network works to protect American consumers. It also considers current issues affecting the global food system. Representative topics include recent food safety problems such as tainted meat and salmonella contamination of eggs; food labeling issues such as the use of the term "grass fed" in meat labeling and the use of GMO seed; organic standards; government efforts to address the obesity problem; urban food deserts; animal welfare concerns; the regulation of pet food, and the like. Specific topics addressed each semester will depend on current events and recent legal developments. Students will be graded on the basis of research paper and class participation.

**LAW 5595. Gender and the Law. 1-3 Credit.**

A study of the treatment of gender by the legal system. Topics will include a survey of writings by influential feminist legal scholars, historians and social scientists; a comparison of different theoretical frameworks; and an overview of substantive law and the latest legal developments involving gender. The primary aim of the course is to study various feminist theories to discern how gender is viewed by today's lawmakers and courts.

**LAW 5615. Health Care Law: The Doctor-Patient Relationship. 1-3 Credit.**

An examination of the law governing the interactions between patients and their health care providers (doctors, hospitals, and managed care organizations). It will focus on rules governing duty to treat, confidentiality, informed consent, medical malpractice liability, institutional vicarious liability, managed care liability, ERISA preemption, and medical malpractice reform. As time permits, the class may also cover selected elements of public health law.

**LAW 5616. Health Care Organization and Fiance Law. 1-3 Credit.**

This upper-level health law course focuses on the regulation, structure and financing of the U.S. health care system. Regulatory and structural issues include the legal organization of health care institutions, accreditation, medical staff dispute, managed care, fraud and abuse, tax exemption, health care transaction, and antitrust. Access and financing issues include private health insurance and Medicare and Medicaid. The Affordable Care Act and its effect on these various issues will be addressed.

**LAW 5620. Immigration Law. 2-3 Credit.**

A study of the development of U.S. immigration and refugee law and policy, with emphasis on current immigration problems and issues. Recent changes in the immigration laws, and future trends in dealing with increasing immigrant pressure.

**LAW 5630. Individual Employment Rights. 1-3 Credit.**

This course explores the legal environment in which non-unionized employees and their employers operate.

**LAW 5632. Innocence Project Clinic. 1-4 Credit.**

This is a joint clinic among the MU and UMKC law schools, the MU School of Journalism and a non-profit group and is called The Midwestern Innocence Project. Law students will work under the supervision of the Clinic Director, a practicing lawyer, on cases of possible actual innocence from six states. Prerequisite: Wrongful Convictions. Graded on S/U basis only.

**LAW 5635. Insurance Law. 1-3 Credit.**

A basic course in the fundamentals of insurance law. Topics covered include defining insurance; risk and the nature of the insurance relationship; insurable interest; indemnity; fortuity; subrogation; coordination of benefits; interpretation; rights a variance with policy provisions; contract formation; warranties, misrepresentation and concealment; condition; agents and brokers; introduction to regulation; introduction to insurance coverage.

**LAW 5640. Intellectual Property. 1-3 Credit.**

This course is an introduction to the four broad areas of intellectual property. Students will learn about intellectual property, contract, and tort knowledge gained for the first year curriculum. The course will cover trademarks, trade secrets, patent law, and copyright law. Thus, the course will cover how one obtains the special property rights called the copyright, patent, trademark contract. Further, the course will cover how these intellectual property property rights are protected from the tortious act of infringement, as well as any defense to infringement it is important to note that this introductory class cannot be used to satisfy any of the requirements for the Intellectual Property certificate; nor is this introductory course substitute for the more in-depth coverage offered by Patent Law & Policy, Copyright Law or Trademark Law. Rather, it is designed to allow students to explore basic intellectual property issues and to meet any prerequisites for Cyberspace Law, Software Law and International Intellectual Property,. Students may find that taking this introductory course complements the rest of the intellectual property curriculum. Class participation and preparations is required, as is class attendance. An exam and several small written projects will be required. Law students should anticipate that this course might be cross-listed, allowing other departments to register graduate students.

**LAW 5641. Intellectual Property Licensing. 1-3 Credit.**

Controversies about the laws surrounding management, use, and licensing of intellectual property frequently dominate the headlines. This course focuses on the realm of intellectual property licensing. Through theoretical discussions and practical exercises, we will examine the many facets of the licensing process, from determination of ownership to decisions on enforcement.

**LAW 5652. International Commercial Arbitration. 2-3 Credit.**

This course offers a study of arbitration as a dispute resolution process for international trade and business disputes. The course reviews ad hoc and institutional arbitration, the authority of arbitral panels, enforcement of agreement to arbitrate, challenging arbitrators, procedure and choice of law in arbitral proceedings, the enforcement of international arbitral awards. Special attention will be given to the international convention on the recognition and enforcement of international arbitral agreements and awards (New York Convention) and the UNCITRAL (U.N. Commission of International Trade Law) arbitral rules and model law. The course focuses on commercial arbitration as an international practice and not on arbitration under any particular national system. Students will participate in a hypothetical arbitration matter, beginning from the development of the claim to preliminary proceedings, the arbitration hearing, and ending with the arbitrators' award.

**LAW 5660. International Human Rights. 1-3 Credit.**

The purpose of this course is not enable students to develop a basic understanding of the concept of international human rights law and the role played by international and regional organizations, states and private actors in defining and enforcing human rights. Beginning with the historical origins of human rights, the course will examine the international regional human rights instruments and institutions that

form the sources of human rights law (the UN system, including the Charter and treaties, European, African and Inter-American human rights regimes). It will also examine the role of non-governmental organization, the International Criminal Court and International humanitarian law (the law of war), and the interaction between US civil rights law and International human right. Throughout the course, students ill be introduced to important critical themes of human rights, including: the distinctions between public and private acts, evolving theories of statehood, sovereignty immunity, cultural relativism, and the western tradition of individual rights, and the relationship between rights and duties. Issues examined will include: political participation and democratization, religious freedom, the use of torture, corporate liability, woman's rights, the right and status of refugees, genocide and war crimes.

**LAW 5665. International Law. 1-3 Credit.**

Introduction to the international legal system, with emphasis on relations between nation-states or international entities. Topics include statehood and recognition, legislative and judicial jurisdiction, human rights and the status of the individual, treaties and international organizations.

**LAW 5670. International Moot Court I. 1 Credit.**

The structure and jurisdiction of the International Court of Justice and the techniques and resources for research in international law. Purpose of the course is to prepare students for the Jessup International Moot Court Competition. Students are not precluded from taking International Law by taking this course. graded on S/U basis only.

**LAW 5675. International Taxation. 1-3 Credit.**

A study of the federal income taxation of international transactions. This course will explore both how the United States taxes income earned by U.S. citizens living overseas ("outbound transactions") as well as how taxes are imposed by the United States on income derived by foreign persons from U.S. sources ("inbound transactions"). Prerequisite: Basic Federal Income Taxation and prior or concurrent enrollment in Advanced Topics in Taxation.;

**LAW 5677. Internet Law and Practice. 1-3 Credit.**

This course will focus on preparing to advise business client dealing with electronic commerce an internet law issues. There is no technological background requirement or prerequisite to take the class. We will explore a variety of themes including the control over the internet by both government and private actors; how online activities differ from their off-line counterparts; and how the laws should react to new forms of interaction and social structures found online. Specific doctrinal topics include problems of digital authorship and publication including rights of anonymity, copyrights, trademarks, defamation and other torts; sales and licensing of products; marketing, advertising and data-mining, including privacy issues; jurisdiction over online actors; and cyber-squatting. Grades will be based on the final exam and an optional short paper.

**LAW 5680. Journal of Dispute Resolution. 1-3 Credit.**

Credit for work as prescribed by the faculty for members of the Journal of Dispute Resolution. S/U graded only.

**LAW 5690. Jurisprudence. 1-3 Credit.**

The major part of the course will cover classic jurisprudential questions about the nature of law - what law is-and related questions regarding judicial decision-making: Under what conditions is a rule a law within a legal system? Are there moral principles that are part of the law even though a legislature has not enacted them? How do judges actually interpret statutes and constitutional clauses? How should they interpret them and are there definitive right answers to disputes about what the

law is? Is it possible to refrain from "legislating from the bent." or does judicial decision-making necessarily involve making new law based on moral and political judgments? In the second part of the course, we will begin thinking about the proper function or aim of some core areas of substantive law. For example, questions might include: Does the criminal law aim to exact retributive justice, to achieve deterrence, or both? Is it legitimate for the legislature to use law to enforce morality of the community's moral belief? Does tort law aim to achieve corrective justice? Does corrective justices require reparations to groups for long past injuries? Reading will include Hart, Fuller, Dworkin, Raz, Ely, Holmes, Scalia, Feinberg, and others.

**LAW 5691. Jury Instructions. 1-3 Credit.**

Theoretical and practical aspects of jury instructions (including general and special verdicts) at trial are presented from the perspectives of the judge, counsel, the jury, and the court of appeals. The course will involve the students in researching and drafting instructions, using pattern instructions, observing or participating in a simulated jury instruction conference, and writing an appellate court opinion that describes what the student has learned during the course.

**LAW 5695. Labor Law. 1-3 Credit.**

The regulation of relations between employers and labor unions at common law and under federal and state legislation; primary emphasis on the National Labor Relations Act, as amended.

**LAW 5697. Landlord Tenant Law and Practice. 1-3 Credit.**

This course primarily focuses on litigation under the Missouri Landlord Tenant statute and under federal administrative regulations governing public entities which provide housing and housing subsidies to low-income people including the processes for litigating against such entities. The course will address pro per pleading, relevant evidentiary issues, and requisite settlement skills/strategies. This course is available to all 2L's and 3L's and is required for all students enrolled in an externship where placement is at Mid Missouri Legal Services for the purpose of Landlord Tenant representation. This course will teach the theory and practice points required to litigate public and private landlord tenant disputes in Missouri. It is a required companion course to the Landlord Tenant placement at Mid Missouri Legal Services Corporation. Together the Mid Missouri Legal Services Placement and seminar will prepare Rule 13 certified law students in the classroom and in the field to represent indigent clients in landlord tenant disputes under the supervision of licensed attorneys. This course and its Legal Services placement advance the law school goal of educating students to integrate the lawyering theory, skills and values required to solve authentic client problems.

**LAW 5698. Landlord/Tenant Practicum. 1-3 Credit.**

The Landlord-Tenant Practicum serves indigent individuals in Mid Missouri. A Mid Missouri Legal Services Corporation staff attorney supervises Rule 13 certified law students representing tenants including but not limited to those who are being evicted and/or who wish to sue their landlords for habitability or security deposit non-return. Students may also represent tenants who reside in public or subsidized housing in administrative actions brought by or against a Housing Authority. The practicum is graded and enrollment is limited. Landlord/Tenant Law and Practice is a pre or co-requisite. Credits earned in the Landlord/Tenant Practicum count toward that 6 hour Externship limit.

**LAW 5700. Land Use Controls. 1-3 Credit.**

This course focuses on laws governing the use and development of land. The course examines legal rules and policy considerations related to zoning, subdivision controls, building codes, historic

preservation, aesthetic regulation, growth management, eminent domain, nuisance law, regional land use conflicts, development exactions, and environmental land use restrictions.

**LAW 5720. Law and Literature. 1-3 Credit.**

Examination of the relationship between law and literature, falling into two main areas: law-in-literature (law, legal institutions and lawyers as depicted in literary works) and law-as-literature (legal documents as literary texts subject to literary techniques of textual analysis and criticism), with emphasis on the former. Readings will include literary and legal texts.

**LAW 5721. Law Practice Management and Technology. 1-3 Credit.**

Managing a successful law practice requires time and project management skills, as well as knowledge about the business of practicing law. This course explores the practical and ethical challenges that confront the solo or small firm lawyer. Students will be introduced to a range of resources for the solo and small firm lawyer, and gain practical experience in preparing a business plan, client welcome package, and policies and procedure manual. Material presented in relevant to both the litigation and the transactional lawyer. Prerequisite: Professional Responsibility.

**LAW 5725. Law and Social Sciences. 1-3 Credit.**

The course takes a social science approach to our understanding of the law, legal developments and legal institutions. Among the topics to be discussed are: historical, theoretical, and political science study of the law, courts, and the judicial process; the policymaking role and impact of the courts; the dynamics and determinants of judicial decisionmaking; and historical accounts of the development of private law.

**LAW 5726. Law and Society. 1-3 Credit.**

Law is a common and yet distinct element of daily life in modern societies, and not only shapes society but is also shaped by society. The creation, interpretation, and enforcement of laws occur in the context of historical changes, societal norms, and the subjective concerns and whims of those charged with its creation. Utilizing an interdisciplinary perspective, the course will explore the nature of law as a set of social systems, central actors in the system, legal reasoning, and the relationship of the legal form and reasoning to social change. By the end of the course, students should be able to evaluate the law and legal institutions, especially in relation to equality, justice, and fairness, and understand how law is involved in the processes of social control, social conflict, and social change.

**LAW 5727. The Law of Tax Exempt Organizations. 1-3 Credit.**

This course will briefly address theories and rationale for exempt organizations and examine in some depth the Internal Revenue Services' tests for tax-exemption and the major types of 501(c)(3) organizations and related contribution deductions, as well as a collection of other 501(c) associations. Attention will be paid to state law regarding formation and operation of Missouri Nonprofit corporations and the IRS application process for recognition of tax-exemption in addition to nonprofit corporate governance matters. Focus will be on Internal Revenue Code provisions, Treasury Regulations, IRS interpretive rulings and case law. Prerequisite: Basic Federal Income Taxation; Business Organizations helpful.

**LAW 5728. The Law of War. 1-3 Credit.**

According to Colonel Wang Ziangsui of the Chinese People's Liberation Army, developing countries should recognize that "the first rule of unrestricted warfare is that there are no rules, with nothing forbidden." Is this true, or can there be Jus in Bello (Justice in War)? In the first phase of this course, we will examine the philosophy of regulating the

law of war, the history of attempts to regulate warfare, and the United States' current posture on the law of war. In the second phase, we will examine laws governing the use of force during conflict (military necessity, proportionality, unnecessary suffering, and the targeting of civilians). We will conclude with a study of the laws governing post-submission opponents (the Geneva Conventions) and issues such as detention, lawful ruses, and unlawful perfidy.

**LAW 5730. Law Review. 1-3 Credit.**

Credit for work as prescribed by the faculty for members of the Missouri Law Review. S/U graded only.

**LAW 5745. Legislation. 1-3 Credit.**

Study of how statutes are drafted, adopted, and interpreted. The principal focus of the course is on the interpretation of statutes by courts.

**LAW 5746. Legislative Practicum. 1-3 Credit.**

Students will be assigned to work with individual lawyer legislators, or lawyer staff, at the Missouri General Assembly, averaging 7-10 hours per week. The students will assist members of the General Assembly by drafting legislation, preparing materials for hearing, conducting research and analysis to respond to broad public policy issues as well as constituent concerns. On occasion students may be assigned to legislative committees, legislative staff support services, or to groups lobbying for legislation. Students will be expected to meet periodically with the professor and to maintain a journal of their activities. Students must also enroll in the Legislative Clinic Seminar. Prerequisite: Professional responsibility. Graded on S/U basis only.

**LAW 5748. Life Skills for Lawyers. 1-3 Credit.**

Readings and discussions will focus on how members of the class want to live their lives as a lawyer. Students will be asked to examine their law school experience and visualize their place in the legal profession. Various problems faced by lawyers (e.g. the pressure to produce billable hours and dealing with clients) will be discussed. Some of the positive aspects of being a lawyer will be identified. The emphasis will be on what the problems and opportunities mean to you personally and the importance of taking responsibility for your own personal and professional life. (not available to students on probation, except for students classified as 3L students).

**LAW 5750. Local Government Law. 1-3 Credit.**

(same as Public Affairs 8866). Structure and powers of local government units; state-local relations, including "home rule"; local government finance, including taxation and indebtedness; incorporation and annexation; eminent domain; tort liability; land use controls; labor relations.

**LAW 5760. Media Law. 1-3 Credit.**

Primary focus will be on practice - what an attorney needs to know in order to represent media clients effectively or, conversely, in order to sue or gag the media. Areas of study include: Access, Damage Control, Prior Restraint, Privacy Protection, Broadcast Rules, Advertising and other issues.

**LAW 5765. Mediation. 1-3 Credit.**

A study of the process in which a neutral third party assists others in resolving a dispute or planning a transaction. The course addresses the mediation movement as regards public policy, politics, professional responsibility, malpractice, and negotiation. Students develop mediation and negotiation skills through readings, demonstrations, experimental exercises, and preparation of a case study.

**LAW 5770. Mediation Clinic. 1-2 Credit.**

(same as Law 6970). Students develop and refine mediation skills by observing and participating in simulated and real mediation cases. Prerequisites: LAW 5765 (or concurrent enrollment), or completion of an approved training. Limited to J.D. or LL.M. students in Designated semesters. Graded on S/U basis only.

**LAW 5775. Journal of Environmental and Sustainability Law (JESL). 1-3 Credit.**

Credit for work as prescribed by the faculty for members of the Missouri Environmental Law and Policy Review. Graded on S/U basis only.

**LAW 5780. Mental Disability and the Law. 1-2 Credit.**

Forensic psychiatry and forensic psychology are burgeoning fields. The news media frequently reports sordid details of heinous crimes that the general public believe could only have been perpetrated by a madman and simultaneously, calls are made to bring these individuals to justice. Social sentiments, and thus public policy initiatives, are becoming increasingly conservative and restrictive in the management of individuals who have a mental disorders and have become entangled in the criminal justice system. This course will explore the impact and interaction of mental disability and the law with a special focus on issues related to the criminal context. Topics will include: mental disorders: comparison and contrasts between clinical and legal definitions; functional implications of mental disorders; legal and clinical issues in the process of criminal forensic evaluations; competence to stand trial; insanity and related defenses; disposition of insanity acquittees; clinical predictions of dangerousness and sexually dangerous persons; competence to be executed; involuntary hospitalization; involuntary treatment; right to treatment; right to refuse treatment; Americans with Disabilities Act; confidentiality; rights of criminally committed persons; sexual predator legislation; and therapeutic jurisprudence.

**LAW 5793. Missouri Administrative Law. 1-3 Credit.**

The Missouri Administrative Law class will examine the philosophical underpinning for the creation of the Administrative hearing Commission (AHC) and the practical realities of prosecuting and defending cases in the venue as a primer for practicing administrative law in Missouri. The course covers such topics as: the history of the AHC, statutory policy considerations, state administrative rule making process and implications, evidence, burden of proof, particular aspects of professional licensing, Department of Natural Resources permitting issues, personnel and discrimination claims, tax cases, judicial review, and attorney fees. The purpose of the course is to provide students with an opportunity to explore the rich variances in Missouri administrative law and to be knowledgeable and confident when faced with an issue in a state administrative venue.

**LAW 5795. Modern Payment System. 1-3 Credit.**

A study of the mechanisms by which credit is extended and payment is made in our society, including coverage of negotiable and quasi-negotiable instruments, letters of credit, bank card systems, and electronic funds transfer systems.

**LAW 5800. Moot Court I. 1-3 Credit.**

Required only for those students participating in the National Moot Court or ABA Moot Court Competitions. Graded on S/U basis only.

**LAW 5805. Moot Court II. 1-2 Credit.**

Required only for those students participating in the National Moot Court or ABA Moot Court Competitions. Graded on S/U basis only.

**LAW 5808. Natural Resources Law. 1-3 Credit.**

Water Law--diffused surface water, groundwater, riparian rights, prior appropriation, permit systems, recreational rights, public trust doctrine, interstate allocation, federal project and regulatory powers; Mining, oil and Gas Law--severance and classification of mineral interests, mineral leases and royalties, implied covenants, regulation of oil and gas production, pooling and unitization, surface owner rights, surface reclamation.

**LAW 5810. Negotiation. 1-3 Credit.**

Negotiation is an essential skill for most lawyers, regardless of practice area. Lawyers must negotiate with their counterparts, clients, partners, staff, courts, and many others in the course of representing a client. This course provides an in-depth understanding of the different models of negotiation, and practical skill development for meeting the many challenges that negotiation presents.

**LAW 5815. Partnership Taxation. 1-3 Credit.**

This course will study the federal income tax treatment of partnerships and other entities treated as partnerships, including limited liability companies. The course will examine partnership formations, contributions to and distributions from partnerships, partnership operations, including special allocations of income and losses among partners, transfers of partnership interests, and partnership dissolutions. This course will be taught using the problem method of instruction. Prerequisite: Basic Federal Income Taxation.

**LAW 5820. Patent Law & Policy. 1-3 Credit.**

This course will provide comprehensive coverage of the U.S. Patent Laws for those interested in obtaining general information about patents, as well as for those interested in practicing before the Patent and Trademark Office. The course will trace an invention through the application, examination, reconsideration, re-examination and litigation processes. If time permits, there may also be coverage of international treaties that affect U.S. Patent Laws as well as some comparison of U.S. Patent Laws and the Patent Laws of select countries. There are no course prerequisites and a technical background is not required because the course primarily focuses on the Patent Act, its requirements and its jurisprudence. Thus, students need only be familiar with applying statutes and cases to a fact pattern. In lieu of an examination or a paper, up to six written projects, between 3-10 pages each (approx. 40 pages overall), will be due at the semester, giving students an intensive writing experience. The professor will review drafts of some of these projects during the semester and all of the projects will be discussed in class. These projects will allow students to help solve a clients hypothetical patent problem as we work through the Patent Act and its jurisprudence. Students may also have the opportunity to engage in client interviewing and counseling in order to complete the projects. There are no prerequisites and a technical background is not required.

**LAW 5830. Pretrial Litigation. 1-3 Credit.**

Focus on the study of the legal principles, techniques, strategies and skills which pertain to civil pretrial practice, including: Professional and Ethical Considerations, Case Selection Case Investigation, Development of a case theory, Pleading, Discovery, Pretrial Conference, Motion Practice, Settlement Processes and Alternative Dispute Resolution.

**LAW 5835. Products Liability. 1-3 Credit.**

A study of civil liability for personal injury, property damage, and economic loss caused by defective products. The study includes actions for negligence, strict liability, misrepresentation and the effect of state and federal legislation on those actions.

**LAW 5840. Public Policy Dispute Resolution. 1-3 Credit.**

Public Policy disputes", such as those that occur in the energy, environmental, education, and health industries, are complex and challenging to manage. This course will explore the intersections of the executive, legislative, and judicial branches of both state and federal government and legal strategies for shaping public policy, whether through litigation, legislation, regulation, alternative dispute resolution or a combination of processes. We will look at two case studies and at least one current issue.

**LAW 5845. Publicly Held Corporation. 3 Credits.**

This course focuses on legal issues most relevant to large public corporations. Recommended for students interested in pursuing a career in corporate law or for students desiring study in corporate law beyond the Business Organizations course.

**LAW 5856. Real Estate Finance. 1-3 Credit.**

This course examines legal and transactional issues relating to the financing of real estate. The course covers mortgage documentation; the use of mortgagee prior to foreclosure; transfers of mortgaged property; transfers of mortgages and securitization; payment and discharge of mortgages; default and impact of bankruptcy on real estate transactions. The grade will be based upon a final examination.

**LAW 5857. Real Estate Finance Skills Project. 1-3 Credit.**

Concurrent registration in Real Estate Finance is required. Students will participate in a weekly seminar class focused on the review, negotiation and drafting of mortgages, deeds of trust, assignments of rents and leases, and other collateral loan documentation (including commercial leases). The grade for the course will be based upon student performance on drafting and practice skills assignments. Projects may include the review, negotiation and drafting of a mortgage, deed of trust, or installment land contract; the review of a loan policy of title insurance; review and evaluation of commercial leases. Student projects will include both individual and group work.

**LAW 5858. Real Estate Transactions. 1-3 Credit.**

This course examines issues relating to the transfer of real estate and the practice of transactional real estate law. The course covers conveyance documentation, the recording system, title and survey review, title insurance, purchase and sale transactions, basis entity structure and tax considerations, environmental review, commercial leasing, valuation of real estate, and project cash flow. The grade will be based on a final examination.

**LAW 5859. Real Estate transaction Skills Project. 1 Credit.**

Concurrent registration in Real Estate Transaction is required. Students will participate in a weekly seminar class focused on contract drafting, negotiation, due diligence, and client management in the contest of a transactional real estate practice. The grade for the course will be based upon student performance on drafting and practice skills assignments. Projects may include the negotiation and drafting of a purchase contract; the negotiation and modification of a commitment for title insurance; survey review; review and evaluation of lease; lease drafting and negotiation. Student projects will include both individual and group work.

**LAW 5865. Religious Liberty and Church-State Relations. 1-3 Credit.**

A study of the protection of religious liberty and the structuring of church-state relations under the U.S. Constitution and selected federal statutes. Examination of how religious freedom developed and analysis of Supreme Court cases decided under the establishment, free exercise, and free speech clauses of the First Amendment.

**LAW 5870. Remedies. 1-3 Credit.**

Survey of damages, history of equity; coverage of various equitable remedies and their adequacy, practicability, defenses, procedural problems, enforcement of decrees, merger of law and equity, contempt.

**LAW 5875. Research in Law. 1-3 Credit.**

Independent Research with a faculty member is available during the Summer, Fall and Spring Semesters. Any student enrolling for Research credit must designate at the time of enrollment the professor who will supervise the research project. Credit is earned at the rate of 20 pages per credit hour. No more than three hours of Research may be taken or counted toward the law degree. Enrollment in 5875 may, but need not, be structured so as to satisfy the upper-level writing requirement. Enrollment in 5875 Research satisfies the Law School's writing requirement only if the project culminates in an individually authored paper of at least 20 pages, based on independent research, through a process that involves an initial draft, critique by the supervising faculty members, and rewrite.

**LAW 5880. Sales and Leases of Goods. 1-3 Credit.**

The law governing the sale and leasing of goods, primarily focusing on Articles 2 and 2A of the Uniform Commercial Code and related federal warranty legislation.

**LAW 5885. Secured Transactions. 1-3 Credit.**

The course focuses on the rights of secured creditors and debtors under Article 9 of the Uniform Commercial Code, and includes coverage of creditors with special rights (such as taxing authorities and artisans), documentary exchanges under Article 7, and bulk sales under Article 6.

**LAW 5890. Securities Regulation. 1-3 Credit.**

Financing of business through the sale of securities. Emphasis on federal securities acts, with some consideration of state statutes. Consideration of the registration process, exemptions from registration, the special antifraud rules, liabilities and criminal penalties; reporting, insider trading, and proxy solicitation problems.

**LAW 5895. Selected Seminar Topics. 1-3 Credit.**

Seminars are offered on communication law, (graded S/U), criminal law, criminal justice administration, environmental law, law and medicine, law and the aged, taxation, legal history, urban problems and other selected topics.

**LAW 5905. Sports Law. 1-3 Credit.**

Substantive areas of concentration include sports litigation, labor law, NCAA regulations, legal relationships in professional sports, anti-trust aspects of sports activities, and collective bargaining. Students are required to negotiate the length and subject matter of at least one graded, written assignment encompassing one or more areas of substantive sports law.

**LAW 5910. State Constitutional Law. 1-2 Credit.**

Since the departure of Chief Justice Warren, the U.S. Supreme Court and other federal courts have taken a less expansive view of the rights granted by the U.S. Constitution. Congress has also taken steps to turn over both funds and authority to states. Both developments have increased the importance of state constitutional law. The course would be taught in three parts: (1) History of state constitutions; their relationship to the U.S. Constitution and the major differences among them; (2) Individual rights; instances in which state constitutional provisions that are facially similar or identical to the Bill of Rights in the U.S. Constitution, have been interpreted by state courts to extend beyond the federal rights, and instances where state constitutions guarantee individual rights that are different from or in addition to those in the U.S. Constitution; and (3) Governmental obligations and authority; Constitutional provisions

allocating governmental authority, such as limitations on legislative authority, the authority of the people to act through referendum or initiative and the relative authority of independent constitutional and officers.

**LAW 5913. State Securities Law and Regulation. 1-3 Credit.**

This course is concerned with securities law and regulation for the Missouri attorney. With an emphasis on state "blue sky" law, topics covered will include securities regulations, registrations, exemptions, and regulatory enforcement actions. Topics will also include investment professional registration and compliance; broker-dealer and investment adviser regulation and compliance; an overview of causes of action in FINRA arbitrations; and an introduction to hedge funds.

**LAW 5915. Tax Research. 1-2 Credit.**

This course provides students with an in-depth exploration of methods and sources for researching tax issues. The course provides students an opportunity to gain experience in using tax research tools. While primarily applicable to tax research, the knowledge gained by students will be helpful in future practice, regardless of practice area. Grade will be based on written assignments to be completed throughout the semester and one final project.

**LAW 5916. Taxation Property Transactions. 1-3 Credit.**

This course will examine tax laws and policies fundamental to real estate investment. Topics include depreciation and recapture, cash and accrual methods of accounting, installments sales, non-recognition transactions, including like-kind exchanges and involuntary conversions, and discharge of indebtedness issues arising out of real estate transactions. This course is designed to provide a detailed analysis of complex tax provisions necessary for advanced tax planning and will be taught using the problem method of instruction. Prerequisite: Basic Income Taxation.

**LAW 5917. Topics in Law. 1-5 Credit.**

Various topics in law are explored in depth. Topics change each semester.

**LAW 5920. Trademark Law. 1-3 Credit.**

Nature of trademark law; common law and statutory trademarks and tradenames; Lanham Act of 1946; distinctiveness; types of marks; qualification of marks for registration (use in commerce, intent-to-use certification, secondary meaning, abandonment); registration procedures; exclusive rights of trademark owner; scope of protection; concurrent use; infringement (including "gray market" use); international protection; remedies; state trademark acts; related common law doctrines; trademark usage on the Internet; domain name issues.

**LAW 5925. Trial Practice. 1-4 Credit.**

Techniques of pleading, discovery, jury selection, opening statements, direct/cross examination of witnesses, preparing jury instructions, closing arguments. Each student participates in classroom problems selected from various phases of litigation, and in one complete trial. Some sections of this course may be offered as a graded section or graded on S/U basis only.

**LAW 5930. Voir Dire. 1-2 Credit.**

This course is designed to provide the students with hands-on experience in selecting a jury. Students will act as lawyers, jurors and one student presiding as judge in the concluding 2-1/2 hour courtroom simulation where a jury is selected after making challenges for cause and exercising preemptory strikes. An actual case involving a badly injured young plaintiff and a large corporate defendant--where liability is questionable--will be the basis for this exercise. The course will outline the purpose of voir dire and the law pertaining to jury selection. Students



will learn active listening skills and how to interpret non-verbal behavior. Examples from prominent, practicing lawyers will be presented. The ultimate purpose of the course is to bring recognition that jury selection is an art--not a science-- and should be tailored to the facts of the case and the witnesses the attorney expects to present. Graded on S/U basis only.

**LAW 5940. White Collar Crime. 1-3 Credit.**

Study of what are generally considered to be business or organizational crimes. General topics to be explored may include: mail and wire fraud, conspiracy, securities fraud, tax fraud, government contracting fraud (with particular emphasis on the False Claims Act), the Hobbs Act and the Racketeer Influenced and Corrupt Organizations Acts.

**LAW 5946. Wrongful Convictions. 1-4 Credit.**

This course offers students an insider's look into the operation of the criminal justice system. It should be of particular interest to any student interested in working in a prosecutor's office, public defender's office or for a firm doing defense work. It is a prerequisite for any student wishing to enroll in the Innocence Project clinic. The course is designed to help students gain insight into features of the criminal justice system that have a tendency to produce wrongful convictions. In addition to examining the causes of wrongful convictions, the course will consider systemic reforms that might minimize convicting the innocent. We will also work with the Midwestern Innocence Project on cases of possible actual innocence. Finally, the class will also focus on recurring ethical issues that confront prosecutors and criminal defense lawyers.

**LAW 6500. London Program. 1-16 Credit.**

Students enrolled in classes in London. Credit will count toward graduation requirements. Zero billing hours.

**LAW 6516. Art and the Law - London Program. 3 Credits.**

The goal of this course is to integrate three fields of knowledge - law, philosophy of aesthetics, and art history. The course will focus on how and why, for functional and other reasons, lawyers answer questions involving issues of art in a very different manner from the way in which philosophers and art historians answer the same questions. The course will concentrate on those areas of law implicated by a society's interest in acquiring and enjoying fine arts. Topics to be covered include, among others, The Law's Answer to the Question "What is Art?"; Artistic Freedom and its Limitations Art and the First Amendment; Rights of the Artist Santutory and Other Protections of Creative Works, including Copyright, the Visual Artists' Rights Act of 1990, and the Moral Right of Artists; Forgery - What's So Special About an Original?; Cultural Artifacts in the International Community The Elgin Marbles; and Stolen Art - Recovering Art Looted by the Nazis. Students will study and compare British Law relating to the fine arts.

**LAW 6710. Comparative Dispute Resolution. 1-2 Credit.**

South Africa Program.

**LAW 6720. Comparative Constitutional Law. 1-2 Credit.**

South Africa Program.

**LAW 6730. Comparative Criminal Justice. 1-2 Credit.**

South Africa Program.

**LAW 6905. LLM Arbitration Seminar. 3 Credits.**

(same as Law 6805). This course would cover law, policy, and practices relating to the arbitration in the U.S. under modern arbitration statutes as well as arbitration of international commercial disputes under international conventions and arbitral rules. Prerequisite: instructor's consent.

**LAW 6910. Advanced Dispute Resolution Practice. 2 Credits.**

(same as Law 6810). This course is designed to give students experience in the practice of dispute resolution skills, primarily focusing on mediation. In simulated cases of a wide variety of types of mediated negotiations, students will act as mediators, parties, and legal representatives. Open to LL.M. students. In extraordinary situations, J.D. students may enroll with the consent of the instructor. Graded on S/U basis only.

**LAW 6915. Advanced Survey of Dispute Resolution. 3 Credits.**

Study of dispute resolution processes to understand the theoretical and practical underpinnings of adjudicative (e.g., litigation and arbitration), evaluative (e.g., neutral evaluation and summary jury trials) and facilitative (e.g., negotiation and mediation) process. Emphasis on assistance to clients in choice of appropriate methods for preventing or resolving disputes and on ethical and professional responsibilities of advocates and neutrals in various processes. Prerequisite: instructor's consent.

**LAW 6920. LL.M. Externship. 1-99 Credit.**

Student will be placed (or secure placement) with attorney, professional mediator or arbitrator, or dispute resolution agency (government-based or private) for an externship ranging three to nine weeks. Students will observe and, to the extent possible, participate in dispute resolution activities of mentor. Journal entries form basis for credit. Externship placements will be local, national or international. Prerequisite: LL.M. students only. Graded on a S/U basis only.

**LAW 6925. LL.M. Independent Study. 1-3 Credit.**

Substantial research project on selected topic of choice. Prerequisite: LL.M. students only.

**LAW 6930. LL.M. Major Research Project. 3 Credits.**

(same as Law [LAW] 6830). Development and presentation of substantial research paper on current topic in dispute resolution. Supervision of this work by appropriate faculty will be determined according to the topic selected. Prerequisite: instructor's consent.

**LAW 6935. Dispute System Design. 3 Credits.**

(same as Law [LAW] 6835). Analysis of system design principles and the management of multi-party complex disputes. Course will include overview of statutes, regulations, court rules and general policy considerations for the development of systematic approaches to the resolution of disputes as well as the consultation process inherent in system design work. An underlying theme for this course will be issues of program quality. Students will review scholarly work evaluating the ADR field and study basic research/evaluation methodologies. Prerequisite: instructor's consent.

**LAW 6940. Negotiation and Mediation Perspectives and Skills. 1 Credit.**

Interactive training program that focuses on the role of the mediator in facilitating settlement. Topics include: theories of competitive and problem solving orientations to negotiation; strengths/weaknesses of mediation as a dispute resolution process; and overview of mediator tasks and responsibilities, such as framing issues, understanding party interest, generating options, and reaching agreement. This course is required for LL.M. students without mediation background and will be delivered in an intensive format during August before regularly scheduled courses begin. Prerequisite: instructor's consent. Graded on S/U basis only.

**LAW 6945. Non-Binding Methods of Dispute Resolution. 3-4 Credit.**

(same as Law [LAW] 6845). Negotiation and mediation of disputes, focusing on the theory, strategy, and skills, and public policy issues

involved in using non-binding methods of dispute resolution. The course addresses the role of attorneys in unassisted and mediated negotiation as well as the role of mediators. The course considers the professional responsibility of advocates negotiating for clients and of mediators.

Prerequisite: instructor's consent.

**LAW 6950. Practicum on Dispute Resolution Training and Education. 1-2 Credit.**

Structured training experience through participation in the first-year curriculum project; service as judges in J.D. student competitions, such as negotiation and client counseling; and assignments to appropriate upper division courses to assist with development of dispute resolution modules. Credit is earned for work over the entire academic year.

Prerequisite: LL.M. students only. Graded on a S/U basis only.

**LAW 6955. Topics. 1-99 Credit.**

Special and emerging topics in dispute resolution. Subject, content and credit varies, depending on available faculty and student interest.

Prerequisite: instructor's consent.

**LAW 6960. Understanding Conflict. 3 Credits.**

(same as Law [LAW] 6860). Study of the origins, nature, and functions of conflict, using perspectives from a variety of disciplines and from literature and religion. The course will include special attention to the idea of conflict as opportunity and will draw on contemplative practices, of the kind that have been developed in many religious traditions, to aid in understanding the relationship between inner and outer conflict. It will focus persistently on the connections between one's assumptions about conflict and one's attitudes and practices about dispute resolution and lawyering. Prerequisite: instructor's consent.

**LAW 6970. Mediation Clinic. 1-2 Credit.**

(same as Law 5770). Students develop and refine mediation skills by observing and participating in simulated and real mediation cases.

Prerequisites: LAW 5765 (or concurrent enrollment), or completion of an approved training. Limited to J.D. or LL.M. students in Designated semesters. Graded on S/U basis only.

## Learning, Teaching, & Curriculum (LTC)

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**LTC 1100. Orientation. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options. Graded on S/U basis only.

**LTC 1110. Orientation: Art Education. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options, emphasizing Art Education. Graded on S/U basis only.

**LTC 1115. Orientation: Social Studies. 1 Credit.**

The course familiarizes and orients students with MU resources, College of Education programs, expectations and career options, emphasizing Social Studies education. Graded on S/U basis only.

**LTC 1120. Orientation: Math Education. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options, emphasizing Math Education. Graded on S/U basis only.

**LTC 1130. Orientation: Middle School Education. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options, emphasizing Middle School Education. Graded on S/U basis only.

**LTC 1140. Orientation: Music Education. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options, emphasizing Music Education. Graded on S/U basis only.

**LTC 1150. Learning Strategies for College Students. 3 Credits.**

Students' learning strategies are assessed, and their needs are given greatest emphasis. Learning through reading and listening are given major consideration as are the corollary skills of vocabulary expansion, studying and note taking.

**LTC 1155. Orientation: Science Education. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options, emphasizing Science Education. Graded on S/U basis only.

**LTC 1160. Orientation: Special Education. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs and expectations and career options, emphasizing Special Education. Graded on S/U basis only.

**LTC 1170. Orientation: English/Language Arts. 1 Credit.**

This course familiarizes and orients students with MU resources, College of Education programs, expectations and career options, emphasizing English/Language Arts education. Graded on S/U only.

**LTC 1180. Orientation: Early Childhood Education. 1 Credit.**

The course familiarizes and orients students with MU resources, College of Education programs, expectations and career options, emphasizing Early Childhood education. Graded on S/U basis only.

**LTC 1190. Orientation: Elementary Education. 1 Credit.**

The course familiarizes and orients students with MU resources, college of Education programs, expectations and career options, emphasizing Elementary Education. Graded on S/U basis only.

**LTC 1200. Coordinated School Health. 2 Credits.**

This course will focus on the concepts of health from the school health perspective, while also incorporating consumer trends, personal health and wellness issues. Environmental health and behavior change theory will be explored.

**LTC 1300. First Aid. 2 Credits.**

Study of the theory and practice of first aid procedures. Certification available.

**LTC 1320. Scuba Theory. 3 Credits.**

The curriculum of the class includes bio-physics, hydrostatic pressures, physiology, fundamentals of compressed gases, environmental conditions, mechanics, first aid as it relates to diving, and planning speciality dives such as decompression, night, cave, ice, salvage and wreck diving.

**LTC 2040. Inquiring into Schools, Community and Society I. 3 Credits.**

This course focuses on schooling in American society, the school community, the school culture and students' lives and identities. Studied are the political, cultural, and economic conditions of the schools.

**LTC 2044. Inquiry into Schools, Community and Society: Field. 1 Credit.**

This field experience course supports the Inquiring into Schools, Community and Society (ISCS), component of Phase I. Graded on S/U basis only.

**LTC 3600. Aiding: Nursery/Day Care Programs. 1-2 Credit.**

Instructionally related duties in the preschool classroom during semesters and summer. Student works 30 hours with supervision for each credit. Prerequisite: instructor's consent.

**LTC 3610. Aiding: Kindergarten. 1-2 Credit.**

Instructionally related activities in kindergarten classroom during semesters and summers. Student works 30 hours with supervision for each credit. Graded on an S/U basis only. Prerequisites: instructor's consent.

**LTC 3620. Aiding: Primary Grades. 1-2 Credit.**

Instructionally related activities in primary grades. Student works 30 hours with supervision for each credit. Graded on an S/U basis only. Prerequisite: instructor's consent.

**LTC 3630. Aiding: Intermediate Grades. 1-2 Credit.**

Instructionally related activities in intermediate grade classrooms. Student works 30 hours with supervision for each credit. Graded on an S/U basis only. Prerequisite: instructor's consent.

**LTC 3640. Aiding: Secondary Schools. 1-2 Credit.**

Instructionally related clinical/administrative and monitorial activities in the secondary classroom during semesters and summer. Student works 30 hours with supervision for each credit. Graded on a S/U basis only. Prerequisite: instructor's consent.

**LTC 4010. Student Teaching. 1-99 Credit.**

Hours, credit must be arranged with director of student teaching. Must apply during February for following year. Prerequisites: special methods courses in area of specialization.

**LTC 4030. Methods in Coordinated School Health. 2 Credits.**

An examination of the Coordinated School Health (CSH) model, including best practices, methods, and assessments used in the elementary classroom to integrate school health into core content areas to support student wellness.

**LTC 4085. Problems in Curriculum and Instruction. 1-3 Credit.**

Studies professional programs and issues in health or physical education. Prerequisite: instructor's consent.

**LTC 4091. Early Childhood Seminar I. 2 Credits.**

Strategies for effectively observing and assessing young children and strategies for building positive family and community relationships, which support children's development and learning. Prerequisite: Admission to Phase II required.

**LTC 4110. Working with Infants and Toddlers. 2-3 Credit.**

Experience working with children aged 6 weeks to 2 1/2 years and their families. Opportunity to apply theories of cognitive, language, and social development. Prerequisite: course in child development and admission to Phase II; admittance to College of Education required.

**LTC 4120. Emergent and Developing Literacy in Early Childhood. 5 Credits.**

Strategies for assessing and supporting young children's literacy development. Must take concurrently with Learning, Teaching and Curriculum [LTC] 4200, 4210 and K-3 field experience. Prerequisite: admittance to College of Education required.

**LTC 4124. Emergent and Developing Literacy Early Childhood Field Experience. 2 Credits.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4120 component of Phase II. Field experience expectations are delineated in the LTC 4120 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4130. Teaching and Learning Math, Science and Social Studies w/ Young Children. 8 Credits.**

Strategies for assessing and supporting young children's math, science and social studies learning. Must take concurrently with a K-3 field experience. Prerequisite: completion of ECE Language/Literacy block; admittance to College of Education required.

**LTC 4134. Teaching & Learning Math, Sci & Soc Studies w/Young Children Field Experience. 3 Credits.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4130 component of Phase II. Field experience expectations are delineated in the LTC 4130 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4140. Early Childhood Seminar II. 3 Credits.**

Reflection on the relationship of theory and practice in ECE. Consideration of various topics including historical influences on early childhood curriculum, models of early childhood curriculum, classroom management, and individualizing curriculum. Prerequisites: Completion of first two semesters of Phase II.

**LTC 4160. Motor Development in Young Children. 2 Credits.**

For Early Childhood majors. Study of young children's motor development. Must be taken as part of the LTC ECE Motor/Art/ Music block. Prerequisite: Admission to Phase II.

**LTC 4170. Pre-Kindergarten Student Teaching. 6 Credits.**

Application of knowledge of child development in working with children aged 2-6 and their families. Emphasis on planning and implementing developmentally appropriate practice. Prerequisite: admission to Phase II and completion of Literacy Block; admittance to College of Education required.

**LTC 4194. Elementary Education Field Experience I. 1-3 Credit.**

Seminars and diverse 1-5 grade classroom experience focus is on the learner and learning in the elementary school. Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 2010, 2014 or Learning, Teaching Curriculum [LTC] 4085, 2040, 2044. Must be in Phase II. Graded on a S/U basis only.

**LTC 4200. Young Children's Emergent Language. 2 Credits.**

For Early Childhood and Elementary Education majors. Study of young children's language development and implications for teachers. Must take with Learning, Teaching and Curriculum [LTC] 4120, 4210, and K-3 field experience. Prerequisite: admittance to Phase II; admittance to College of Education required.

**LTC 4210. Children's Literature. 2 Credits.**

For Early Childhood and Elementary Education majors. Surveys the field of children's literature. Must be taken with Learning, Teaching and Curriculum [LTC] 4120, 4200, and K-3 field experience. Prerequisite: admittance to Phase II; admittance to College of Education required.

**LTC 4211. Essential Literacy: Reading. 3 Credits.**

A study of children's reading development encompassing writing, Children's Literature, and emergent language. Prerequisite: admittance into Phase II.

**LTC 4220. Emergent Literacy. 3 Credits.**

Emergent reading. Instructional methods, diagnostic procedures, and materials appropriate for learners in elementary grades 1-3. Prerequisite: completion of Phase I.

**LTC 4221. Essential Literacy: Writing. 2 Credits.**

A study of children's writing development encompassing reading, Children's Literature, and emergent language. Prerequisite: Admittance into Phase II.

**LTC 4231. Advanced Applications of Literacy. 3 Credits.**

Provides pre-service teachers with information about the current reading curriculum and practices in their on-site program. Topics will include assessment, diversity, children's literature, technology, planning and delivering instruction, professional development and management (classroom, behavior and lesson). Prerequisite: Admittance to Phase II of the Elementary Education Program; Education and graduate students only. Graded on A/F basis only.

**LTC 4240. Art for Children. 2 Credits.**

This course focuses on appropriate teaching methods and strategies for teaching art (studio, art history, aesthetic, and criticism), artistic development of children, and curriculum, instructional, and organization strategies for the art classroom; admittance to College of Education required.

**LTC 4241. Inquiry into Literacy Applications. 3 Credits.**

Provides pre-service teachers with opportunities to study literacy topics from a broad perspective. Topics will enable students to integrate literacy theory with field-based practice in relevant and meaningful ways through writing, discussion and self-reflection. Prerequisite: Admittance to Phase II of the Elementary Education Program. Education and graduate students only. Graded on A/F basis only.

**LTC 4250. Music for Children. 2 Credits.**

Preparation of early childhood and elementary education students with the skills, knowledge, and philosophical foundations necessary to integrate music into the early childhood and elementary curricula. Prerequisite: Music for Non-Majors [MUSIC\_NM] 1608, 1612, 1618 or competency test; admittance to College of Education required.

**LTC 4260. Elementary Social Studies. 3 Credits.**

To develop knowledge of social studies and the skills to teach social studies in the elementary school. The course is designed to provide the student with the skills to plan, implement, and evaluate both the teaching and learning processes for the elementary social studies classroom. Prerequisites: acceptance into Phase II, admittance to College of Education required.

**LTC 4280. Teaching Science in Elementary Schools. 3 Credits.**

Concepts, materials, methods in the elementary school program. Prerequisite: Admittance to Phase II and College of Education required.

**LTC 4294. Elementary Education Field Experience II. 1-3 Credit.**

Seminars and diverse 1-5 grade classroom experiences focus is on the teacher and instruction in the elementary school. Prerequisites: Education, School and Counseling Psychology [ESC\_PS] 2010, 2014; Learning, Teaching and Curriculum [LTC] 2040, 2044, 4194, must be enrolled in Phase II. Graded on S/U basis only.

**LTC 4300. Learning and Teaching Number and Operation in the Elementary School. 3 Credits.**

The purpose of this course is to (a) develop a deeper understanding of number and operation, (b) connect the mathematical knowledge of

number as described in (a) to the learning and teaching of number in elementary school. Prerequisites: acceptance into Phase II.

**LTC 4310. Learning and Teaching Geometry in the Elementary School. 3 Credits.**

The purpose of this course is to (a) develop a deeper understanding of geometry and measurement, (b) critically examine content and issues of the complexities in teaching and learning fundamental concepts of geometry and measurement in elementary schools. Prerequisite: acceptance into Phase II.

**LTC 4320. Middle School Social Studies I. 3 Credits.**

Curriculum decision making, instructional planning, techniques and strategies, materials selection, approaches to assessment in middle level social studies, all based upon early adolescent growth and development principles. Prerequisite: admittance to the College of Education required.

**LTC 4324. Middle School Social Studies Field I. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4320 component of Phase II for MS students. Field experience expectations are delineated in the LTC 4320 course syllabi. Phase II admittance required. Graded on S/U basis only.

**LTC 4334. Middle School Social Studies Field Experience II. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4550 component of Phase II for MS students. Field experience expectations are delineated in the LTC 4550 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4340. Middle School Science I. 3 Credits.**

Concepts, materials, methods in middle school program. Prerequisite: Admittance to Phase II and the College of Education required.

**LTC 4344. Middle School Science Field I. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4340 component of Phase II. Field experience expectations are delineated in the LTC 4340 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4350. Middle School Science II. 3 Credits.**

Concepts, materials, methods in the middle school program. Prerequisite: Admittance to phase II and College of Education required.

**LTC 4354. Middle School Science Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4350 component of Phase II. Field experience expectations are delineated in the LTC 4350 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4360. Intro. Teaching Mathematics in Middle and Secondary Schools. 3 Credits.**

Introduction to teaching mathematics including: professional mathematics teacher associations and journals, learning theories related to teaching mathematics, tools, and materials for teaching mathematics, curriculum and instructional strategies (middle and lower high school level), and techniques for assessing mathematical understanding. Prerequisites: professional standing, Mathematics [MATH] 1360; admittance to College of Education required.

**LTC 4364. Intro. Teaching Math in Middle and Secondary School Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4360 component of Phase II. Field experience expectations are delineated in the LTC 4360 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4370. Teaching and Modeling Middle School Mathematics. 3 Credits.**

Major issues/topics of the course include: nature of middle school students, lesson planning, developing and utilizing teaching strategies, assessment alternatives, teaching via problem solving and mathematical modeling, interdisciplinary strategies and materials, and techniques for assessing mathematical understanding. Prerequisite: Learning, Teaching and Curriculum [LTC] 4360/7360 and at least 18 hours of required mathematics; admittance to College of Education required.

**LTC 4374. Teaching and Modeling Middle School Mathematics Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4370 component of Phase II. Field experience expectations are delineated in the LTC 4370 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4380. Teaching Middle School Language Arts I. 3 Credits.**

Integrates an understanding of literacy (highlighting reading) with content area demands, literature and other media texts, evaluation and inquiry within a context of diversity. Prerequisite: Admittance to Phase II of College of Education.

**LTC 4384. Teaching Middle School Language Arts I Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4380 component of Phase II. Field experience expectations are delineated in the LTC 4380 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4390. Teaching Middle and Secondary English/Language Arts II. 3 Credits.**

Prepares prospective educators with the knowledge, skills, and strategies necessary for integrating and teaching the English/Language Arts, primarily focusing on the teaching of writing and critical thinking. Prerequisites: Admittance to Phase II of College of Education.

**LTC 4394. Teaching Middle School Language Arts II Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4390 component of Phase II. Field experience expectations are delineated in the LTC 4390 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4400. Teaching Middle and Secondary English/Language Arts III. 3 Credits.**

Prepare prospective educators by focusing on the teaching of American culture and critical thinking, through literacy, mediacy, oracy, and cultural artifacts. Prerequisites: Learning, Teaching and Curriculum [LTC] 4380/7380 and 4390/7390; admittance to Phase II of College of Education.

**LTC 4404. Teaching Middle School Language Arts III Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4400 component of Phase II. Field experience expectations are delineated in the LTC 4400 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4410. Teaching, Engaging and Assessing Middle-Level Students. 3 Credits.**

In this course students will learn about the specific and individual needs of middle-level students and develop the skills and understandings to

meet these needs. Prerequisite: admittance to College of Education required.

**LTC 4414. Teaching, Engaging & Assessing Mid-Level Students Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4410 component of Phase II. Field experience expectations are delineated in the LTC 4410 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4420. Adolescent Literacy. 3 Credits.**

Explores literacy implications of content areas. Topics include determining the difficulty of text, examining literature that supports content, creating alternative assessments, and evaluating reading/writing strategies as tools for learning. (Required of all students obtaining certification in middle school or concurrent certification in middle and secondary school area(s) except language arts. Prerequisite: admittance to College of Education required.

**LTC 4424. Middle School Literacy Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4420 component of Phase II. Field experience expectations are delineated in the LTC 4420 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4460. Teaching English to Speakers of Other Languages. 3 Credits.**

(Same as English [ENGLSH] and Linguistics [LINGST] 4650.) Linguistic and pedagogical principles of teaching English to speakers of other languages. Prerequisite: English [ENGLSH] 4600 and English [ENGLSH] 4610 or equivalent. Acceptance into Phase II of LTC. Graded A-F only.

**LTC 4470. Teaching Secondary English/Language Arts I. 3 Credits.**

Prepares prospective educators with the knowledge, skills, and strategies necessary for integrating and teaching the English/Language Arts, Primarily focusing on Young Adult Literature and critical thinking. Prerequisite: Admittance to Phase II of College of Education.

**LTC 4474. Teaching Secondary English/Language Arts I Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4470 component of Phase II. Field experience expectations are delineated in the LTC 4470 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4480. Teaching Middle and Secondary English/Language Arts II. 3 Credits.**

Prepares prospective educators with the knowledge and strategies necessary for integrating and teaching the English/Language Arts, primarily focusing on the teaching of writing and critical thinking. Prerequisite: admittance to Phase II of College of Education.

**LTC 4484. Teaching Secondary English/Language Arts II Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4480 component of Phase II. Field experience expectations are delineated in the LTC 4480 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4490. Teaching Middle and Secondary English/Language Arts III. 3 Credits.**

Prepares prospective educators by focusing on the teaching of American culture and critical thinking, through literacy, mediacy, oracy, and cultural artifacts. Prerequisites: Learning, Teaching and Curriculum

[LTC] 4470/7470 and 4480/7480; admittance to Phase II of College of Education.

**LTC 4494. Teaching Secondary English/Language Arts III Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4490 component of Phase II. Field experience expectations are delineated in the LTC 4490 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4500. Emergent Language in Early Childhood. 3 Credits.**

Study of language learning in young children; how meaning of the environment is gained through language; implications for teachers working with children from varying language-learning environments.

**LTC 4510. Assessment in Early Childhood Education. 3 Credits.**

A study of formal and informal assessment instruments and procedures used to measure progress and determine developmentally appropriate curriculum for children in early childhood settings.

**LTC 4520. Literature in the Elementary School. 3 Credits.**

Surveys the field of literature for children and adolescents, with emphasis on selected readings of various types of literature. Prerequisites: junior standing or instructor's consent.

**LTC 4530. Introduction to Social Studies. 3 Credits.**

Will introduce prospective teachers to the profession of social studies teaching; to the bases for making curriculum choices in social studies and the process of choosing content; and the process of planning curriculum and instruction in social studies classrooms. Prerequisites: acceptance into Phase II and to the College of Education required.

**LTC 4534. Secondary Social Studies I Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4530 component of Phase II. Field experience expectations are delineated in the LTC 4530 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4540. Teaching of Reading. 3 Credits.**

Materials, methods used in teaching reading in elementary grades. Prerequisites: Educational, School and Counseling Psychology [ESC\_PS] 2400 and professional standing.

**LTC 4541. Teaching Social Studies. 3 Credits.**

Is designed for the secondary social studies teachers to develop knowledge of social studies and the skills to teach social studies. The student will plan, implement and evaluate both the teaching and learning processes for secondary social studies classrooms. Prerequisites: acceptance into Phase II and to College of Education required. Graded on A-F basis only.

**LTC 4544. Secondary Social Studies II Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4541 component of Phase II. Field experience expectations are delineated in the LTC 4541 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4550. Assessment in Social Studies. 3 Credits.**

Will address the purposes and development of social studies assessment for all levels from classroom to national assessment. Assessment will be used to reflect upon curriculum/instruction, make revisions and set goals. Prerequisites: acceptance into Phase II and to College of Education required.

**LTC 4554. Secondary Social Studies III Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4550 component of Phase II. Field experience expectations are delineated in the LTC 4550 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4560. Teaching Reading in the Content Areas. 2-3 Credit.**

For secondary school teachers. Specific ways teachers can help students improve reading skills in content areas and ways reading can be taught in reading classes. Prerequisite: Phase II admittance. Restricted to College of Education Majors with 60+ credit hours.

**LTC 4570. Organization of Public School Art. 2 Credits.**

Purposes, practices of art experiences in elementary and secondary schools. Designed for teachers, supervisors, administrators.

**LTC 4571. Introduction to Teaching Mathematics in Middle and Secondary Schools. 3 Credits.**

Introduction to teaching mathematics including: professional mathematics teacher associations and journals, learning theories related to teaching mathematics, tools, and materials for teaching mathematics, curriculum and instructional strategies (middle and lower high school level), and techniques for assessing mathematical understanding. Prerequisites: professional standing, Mathematics [MATH] 2300.

**LTC 4574. Intro. Teaching Math in Middle and Secondary School Field Experience. 1 Credit.**

Field experience supporting the Learning, Teaching and Curriculum [LTC] 4571 component of Phase II. Field experience expectations are delineated in the LTC 4571 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4580. Social Studies in the Elementary School. 3 Credits.**

Problems in preparation, teaching of units with suitable materials, techniques. Prerequisites: Educational School, and Counseling Psychology [ESC\_PS] 2400, professional standing.

**LTC 4581. Teaching Mathematics in Secondary Schools: Algebra. 3 Credits.**

Major issues/topics of the course are: exploration of curriculum, teaching strategies, and assessment for algebra and pre-calculus/calculus. Lesson planning, integration of appropriate models, mathematical connections, calculators and computer technology will be developed. Prerequisite: Learning, Teaching and Curriculum [LTC] 4571/7571; admittance to College of Education required.

**LTC 4584. Teaching Math in Secondary Schools: Algebra Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4581 component of Phase II. Field experience expectations are delineated in the LTC 4581 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4587. Seminar in Curriculum and Instruction. 1-3 Credit.**

Seminar in Curriculum and Instruction.

**LTC 4590. Teach.Math in Sec.Schools: Focus on Geometry, Probability and Statistics. 3 Credits.**

Provides experience which advanced students' knowledge, understanding, and facility in engaging students in learning mathematics. Major issues/topics highlighted in the course are: exploration of curriculum, teaching strategies, and assessment for geometry, probability and statistics. Prerequisite: Learning, Teaching and Curriculum [LTC] 4571/7571; admittance to College of Education required.

**LTC 4594. Teach Math in Sec Sch: Focus on Geometry/Probability. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4590 component of Phase II. Field experience expectations are delineated in the LTC 4590 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4600. Diagnosis and Remediation of Learning Problems in Math - Middle. 3 Credits.**

The study of diagnostic and remedial instructional techniques for the teaching of mathematics. Emphasis is placed on alternative teaching methods and strategies.

**LTC 4610. Teaching Techniques and Curriculum in Elementary School Math. 3 Credits.**

The mathematics program in the elementary school from viewpoint of goals, content, techniques and evaluation.

**LTC 4620. Information Literacy in Teaching and Learning. 3 Credits.**

Discusses the nature, value, and power of information as product and process; organization, retrieval, and evaluation of information; explores the Internet and information superhighway; develops skills for resource based learning for classroom instruction; policy issues.

**LTC 4630. Health Education in the Elementary School. 3 Credits.**

Defines teacher's role in school health program; investigates health needs of school children; focuses on teaching strategies, health resources and development of elementary school health education curricula and materials.

**LTC 4631. Teach.Sci.Second.Sch.:Phil.,Hist., Sci.Inq.,Curr., Assm., & Teach I. 3 Credits.**

An integration of the philosophy and history of science, technology, society; teaching science as inquiry; classroom management, strategies and curricula for teaching/learning science; and using technology in science learning. Prerequisite: professional standing; admittance to College of Education required.

**LTC 4634. Teaching Middle and Secondary Science I Field. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4631 component of Phase II. Field experience expectations are delineated in the LTC 4631 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4640. Motor Development in Early Childhood. 3 Credits.**

Motor development of infants and children with emphasis on: study of interaction between biological and environmental factors affecting development, motor assessment techniques, and designing programs to enhance motor development. Prerequisite: Educational, School and Counseling Psychology [ESC\_PS] 2400.

**LTC 4641. Teaching Middle and Secondary Science II. 3 Credits.**

An integration of the philosophy and history of science, technology, society; teaching science as inquiry; classroom management, strategies and curricula for teaching/learning science; and using technology in science learning. Prerequisite: professional standing and Teaching Science in the Secondary School, Part I; admittance to College of Education required.

**LTC 4644. Teaching Middle and Secondary Science II Field. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4641 component of Phase II. Field experience expectations are delineated in the LTC 4641 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4650. Education in Human Sexuality. 3 Credits.**

The biological, psychosocial and educational aspects of human sexuality with special emphasis on instructional activities related to interpersonal communication, decision-making ability and clarification of values, course is designed for both teachers and health-care personnel. Prerequisite: Learning, Teaching and Curriculum [LTC] 1310 or equivalent.

**LTC 4651. Teach.Sci.Second.Sch.:Phil.,Hist.,Sci.Inq.,Curr.,Assm., & Tech III. 3 Credits.**

An integration of the philosophy and history of science, technology, society; teaching science as inquiry; classroom management, strategies and curricula for teaching/learning science; and using technology in science learning. Prerequisite: professional standing and Teaching Science in the Secondary School, Parts 1 and II; admittance to College of Education required.

**LTC 4654. Teach Sci Second Sch: Phil,Hist,Sci Inq,Curr,Assm & Tech III Fld. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4651 component of Phase II. Field experience expectations are delineated in the LTC 4651 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4660. Drug Education. 3 Credits.**

The psychosocial, legal and pharmacological aspects of the recreational use of over-the-counter and street drugs are investigated with emphasis being placed on personal decision making, principles of school and community drug education, rehabilitation and community health services.

**LTC 4670. Teaching Music I. 3 Credits.**

Study of skills, knowledge, and philosophical foundations necessary to teach general music to children in grades pre-K, including methods, philosophies, and teach and learner behaviors. Prerequisite: junior standing; music education majors or instructor's consent; admittance to College of Education required.

**LTC 4674. Teaching Music I Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4670 component of Phase II. Field experience expectations are delineated in the LTC 4670 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4680. Teaching Legal Rights and Responsibilities of Citizenship. 2 Credits.**

An introductory course for teachers and undergraduate students dealing with the teaching of the basic legal concepts which underlie effective citizenship.

**LTC 4681. Teaching Music II. 2 Credits.**

Study of a broad repertoire of music literature and instructional materials, including critical evaluation and analysis for use in the general music classroom. Prerequisite: Learning, Teaching and Curriculum [LTC] 4670/7670; admittance to College of Education required.

**LTC 4684. Teaching Music II Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4680 component of Phase II. Field experience expectations are delineated in the LTC 4680 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4690. Teaching Music III. 3 Credits.**

A study of various strategies for the successful teaching of Middle and high school music programs. Prerequisite: Learning, Teaching and Curriculum [LTC] 4680/7680; admittance to College of Education required.

**LTC 4694. Teaching Music III Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4690 component of Phase II. Field experience expectations are delineated in the LTC 4690 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4730. Overview of Art Education. 3 Credits.**

This is the first of a three course sequence and serves as the foundation for inquiries of methodological and philosophical approaches to the teaching of the visual arts at the elementary and secondary level. Prerequisite: admittance to College of Education required.

**LTC 4734. Overview of Art Education Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4730 component of Phase II. Field experience expectations are delineated in the LTC 4730 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4740. Inquiry into Art Education: Pre-School Through Middle School. 3 Credits.**

The second of three course sequence. It will cover art education issues as they apply to the Pre-School through Middle School setting. Prerequisite: admittance to College of Education required.

**LTC 4744. Inquiry into Art Education: Pre-School Through Middle School Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching Curriculum [LTC] 4740 component of Phase II. Field experience expectations are delineated in the LTC 4740 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4750. Inquiry into Art Education: Secondary. 3 Credits.**

The third of a three course sequence. Student will learn about secondary art education and make application to practice with emphasis on adolescent development, curriculum design, student assessment, instruction, diversity/equity, and professionalism. Prerequisite: admittance to College of Education required.

**LTC 4754. Inquiry into Art Education: Secondary Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 4750 component of Phase II. Field experience expectations are delineated in the LTC 4750 course syllabi. Phase II admittance required. Graded on a S/U basis only.

**LTC 4960. Special Readings in Curriculum and Instruction. 1-3 Credit.**

Directed study of literature and research reports in education.

**LTC 4971. Internship and Capstone Seminar. 1-16 Credit.**

Internship is a full-semester experience in the public schools, including a capstone seminar addressing problems of practice (integrating subjects, reading and writing across the curriculum, meeting all students' needs), and evaluation of the interns preparation for entering the profession. It is offered each Fall and Spring for 10-16 credit hours. Admittance to College of Education required. Prerequisites: Education, Leadership and Policy Analysis [ED\_LPA] 4060/7060 and admittance into Phase III.

**LTC 7010. Student Teaching. 1-99 Credit.**

Hours, credit must be arranged with director of student teaching. Must apply during February for following year. Prerequisites: graduate standing and special methods courses in area of specialization.

**LTC 7040. Inquiring into Schools, Community and Society I. 2-3 Credit.**

This course focuses on schooling in American society, the school community, the school culture and students' lives and identities. Studied are the political, cultural, and economic conditions of the schools. Prerequisites: graduate standing and Teacher Development Program [TDP] 2020 and completion of Phase I or enrollment in a graduate level program in the College of Education.

**LTC 7085. Problems in Curriculum and Instruction. 1-3 Credit.**

Studies professional programs and issues in health or physical education. Prerequisite: graduate standing and instructor's consent.

**LTC 7091. Early Childhood Seminar I. 2 Credits.**

Strategies for effectively observing and assessing young children and strategies for building positive family and community relationships, which support children's development and learning. Prerequisite: Admission to Phase II required.

**LTC 7110. Working with Infants and Toddlers. 3 Credits.**

Experience working with children aged 6 weeks to 2 1/2 years and their families. Opportunity to apply theories of cognitive, language, and social development. Prerequisite: graduate standing and course in child development and admission to Phase II; admittance to College of Education required.

**LTC 7120. Emergent and Developing Literacy in Early Childhood. 5 Credits.**

Strategies for assessing and supporting young children's literacy development. Must take concurrently with Teacher Development Program [TDP] 4200, 4210 and K-3 field experience. Prerequisite: graduate standing and admittance to College of Education required.

**LTC 7124. Emergent & Developing Literacy Early Childhood Field Experience. 2 Credits.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7120 component of Phase II. Field experience expectations are delineated in the LTC 7120 course syllabi. Phase II admittance required. Graded on a S/U basis only. Graduate Standing Required.

**LTC 7130. Teaching & Learning Math, Sci. & Social Studies w/Young Children. 8 Credits.**

Strategies for assessing and supporting young children's math, science and social studies learning. Must take concurrently with a K-3 field experience. Prerequisite: graduate standing and completion of ECE Language/Literacy block; admittance to College of Education required.

**LTC 7134. Teach & Learn Math, Sci & Soc Studies w/Young Children Fld Exp. 3 Credits.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7130 component of Phase II. Field experience expectations are delineated in the LTC 7130 course syllabi. Phase II admittance required. Graded on S/U basis only. Graduate Standing Required.

**LTC 7140. Early Childhood Seminar II. 3 Credits.**

Reflection on the relationship of theory and practice in ECE. Consideration of various topics including historical influences on early childhood curriculum, models of early childhood curriculum, classroom management, and individualizing curriculum. Prerequisites: completion of first two semesters of Phase II.

**LTC 7160. Motor Development in Young Children. 2 Credits.**

For Early Childhood majors. Study of young children's motor development. Must be taken as part of the TDP ECE Motor/Art/Music block. Prerequisite: Admission to Phase II.



**LTC 7170. Pre-Kindergarten Student Teaching. 6 Credits.**

Application of knowledge of child development in working with children aged 2-6 and their families. Emphasis on planning and implementing developmentally appropriate practice. Prerequisite: graduate standing and admission to Phase II and completion of Literacy Block; admittance to College of Education required.

**LTC 7200. Young Children's Emergent Language. 2 Credits.**

For Early Childhood and Elementary Education majors. Study of young children's language development and implications for teachers. Must take with Teacher Development Program [TDP] 4120, 4210, and K-3 field experience. Prerequisite: graduate standing and admittance to Phase II; admittance to College of Education required.

**LTC 7210. Children's Literature. 2 Credits.**

For Early Childhood and Elementary Education majors. Surveys the field of children's literature. Must be taken with Teacher Development Program [TDP] 4120, 4200, and K-3 field experience. Prerequisite: graduate standing and admittance to Phase II; admittance to College of Education required.

**LTC 7220. Emergent Literacy. 3 Credits.**

Emergent reading. Instructional methods, diagnostic procedures, and materials appropriate for learners in elementary grades 1-3. Prerequisite: graduate standing and completion of Phase I.

**LTC 7224. Emergent Literacy Field Experience. 2 Credits.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7220 component of Phase II. Field experience expectations are delineated in the LTC 7220 course syllabi. Phase II admittance required. Graded on S/U basis only. Graduate Standing Required.

**LTC 7240. Art for Children. 2 Credits.**

This course focuses on appropriate teaching methods and strategies for teaching art (studio, art history, aesthetic, and criticism), artistic development of children, and curriculum, instructional, and organization strategies for the art classroom; admittance to College of Education required. Prerequisite: graduate standing.

**LTC 7340. Middle School Science I. 3 Credits.**

Concepts, materials, methods in middle school program. Prerequisite: graduate standing and Phase I admittance; admittance to the College of Education required.

**LTC 7350. Middle School Science II. 3 Credits.**

Concepts, materials, methods in the middle school program. Prerequisite: graduate standing and Phase I; admittance to College of Education required.

**LTC 7360. Intro. Teaching Mathematics in Middle & Secondary. 3 Credits.**

Introduction to teaching mathematics including: professional mathematics teacher associations and journals, learning theories related to teaching mathematics, tools, and materials for teaching mathematics, curriculum and instructional strategies (middle and lower high school level), and techniques for assessing mathematical understanding. Prerequisites: graduate standing and professional standing, Mathematics [MATH] 1360; admittance to College of Education required.

**LTC 7370. Teaching and Modeling Middle School Mathematics. 3 Credits.**

Major issues/topics of the course include: nature of middle school students, lesson planning, developing and utilizing teaching strategies, assessment alternatives, teaching via problem solving and mathematical modeling, interdisciplinary strategies and materials, and techniques

for assessing mathematical understanding. Prerequisites: Graduate Standing and Learning, Teaching and Curriculum [LTC] 4360/7360 and at least 18 hours of required mathematics; admittance to College of Education required.

**LTC 7380. Teaching Middle School Language Arts I. 3 Credits.**

Integrates an understanding of literacy (highlighting reading) with content area demands, literature and other media texts, evaluation and inquiry within a context of diversity. Prerequisite: admittance to Phase II of College of Education.

**LTC 7384. Middle School Language Arts I Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7380 component of Phase II. Field experience expectations are delineated in the LTC 7380 course syllabi. Phase II admittance required. Graded on S/U basis only. Graduate Standing Required.

**LTC 7390. Teaching Middle and Secondary English/Language Arts II. 3 Credits.**

Prepares prospective educators with the knowledge, skills, and strategies necessary for integrating and teaching the English/Language Arts, primarily focusing on the teaching of writing and critical thinking. Prerequisite: admittance to Phase II of College of Education.

**LTC 7394. Middle School Language Arts II Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7390 component of Phase II. Field experience expectations are delineated in the LTC 7390 course syllabi. Phase II admittance required. Graded on S/U basis only. Graduate Standing Required.

**LTC 7400. Teaching Middle and Secondary English/Language Arts III. 3 Credits.**

Prepares prospective educators by focusing on the teaching of American culture and critical thinking, through literacy, mediacy, oracy, and cultural artifacts. Prerequisite: Teacher Development Program [TDP] 4380/7380 and 4390/7390; admittance to Phase II of College of Education.

**LTC 7404. Middle School Language Arts III Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7400 component of Phase II. Field experience expectations are delineated in the LTC 7400 course syllabi. Phase II admittance required. Graded on S/U basis only. Graduate standing required.

**LTC 7410. Teaching, Engaging and Assessing Middle-Level Students. 3 Credits.**

In this course students will learn about the specific and individual needs of middle-level students and develop the skills and understandings to meet these needs. Prerequisite: graduate standing and admittance to College of Education required.

**LTC 7414. Teaching, Engaging & Assessing Mid-Level Students. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7410 component of Phase II. Field experience expectations are delineated in the LTC 7410 course syllabi. Phase II admittance required. Graded on a S/U basis only. Graduate Standing Required.

**LTC 7420. Adolescent Literacy. 3 Credits.**

Explores literacy implications of content areas. Topics include determining the difficulty of text, examining literature that supports content, creating alternative assessments, and evaluating reading/writing strategies as tools for learning. (Required of all students obtaining certification in middle school or concurrent certification in middle and

secondary school area(s) except language arts. Prerequisite: graduate standing and admittance to College of Education required.

**LTC 7424. Middle School Literacy Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7420 component of Phase II. Field experience expectations are delineated in the Learning, Teaching and Curriculum [LTC] 7420 course syllabi. Phase II admittance required. Graded on a S/U basis only. Prerequisite: graduate standing.

**LTC 7460. Teaching English to Speakers of Other Languages. 3 Credits.**

(same as English [ENGLSH] 7650). Linguistics and pedagogical principles of teaching English to speakers of other languages. Prerequisite: English [ENGLSH] 7600 and 7610 or equivalent. Prerequisite: acceptance into Phase II. Graded on A/F basis only.

**LTC 7470. Teaching Secondary English/Language Arts I. 3 Credits.**

Prepares prospective educators with the knowledge, skills, and strategies necessary for integrating and teaching the English/ Language Arts, primarily focusing on Young Adult Literature and critical thinking. Prerequisite: admittance to Phase II of College of Education.

**LTC 7474. Teaching English/Language Arts I Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7470 component of Phase II. Field experience expectations are delineated in the LTC 7470 course syllabi. Phase II admittance required. Graded on S/U basis only. Graduate Standing Required.

**LTC 7480. Teaching Middle and Secondary English/Language Arts II. 3 Credits.**

Prepares prospective educators with the knowledge, skills, and strategies necessary for integrating and teaching the English/ language Arts, primarily focusing on the teaching of writing and critical thinking. Prerequisite: admittance to Phase II of College of Education.

**LTC 7484. Teaching English/Language Arts II Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7480 component of Phase II. Field experience expectations are delineated in the LTC 7480 course syllabi. Phase II admittance required. Graded on an S/U basis only. Graduate Standing Required.

**LTC 7490. Teaching Middle and Secondary English/Language Arts III. 3 Credits.**

Prepares prospective educators by focusing on the teaching of American culture and critical thinking, through literacy, mediacy, oracy, and cultural artifacts. Prerequisites: Teacher Development Program [TDP] 4470/7470 and 4480/7480; admittance to Phase II of College of Education.

**LTC 7494. Language Arts III Field Experience. 1 Credit.**

This field experience supports the Learning, Teaching and Curriculum [LTC] 7490 component of Phase II. Field experience expectations are delineated in the LTC 7490 course syllabi. Phase II admittance required. Graded on a S/U basis only. Graduate Standing Required.

**LTC 7500. Emergent Language in Early Childhood. 3 Credits.**

Study of language learning in young children; how meaning of the environment is gained through language; implications for teachers working with children from varying language-learning environments. Prerequisites: graduate standing.

**LTC 7510. Assessment in Early Childhood Education. 3 Credits.**

A study of formal and informal assessment instruments and procedures used to measure progress and determine developmentally appropriate

curriculum for children in early childhood settings. Prerequisites: graduate standing.

**LTC 7520. Literature in the Elementary School. 3 Credits.**

Surveys the field of literature for children and adolescents, with emphasis on selected readings of various types of literature. Prerequisites: graduate standing or instructor's consent.

**LTC 7540. Teaching of Reading. 3 Credits.**

Materials, methods used in teaching reading in elementary grades. Prerequisites: graduate standing and Education, School and Counseling Psychology [ESC\_PS] 2400 and professional standing.

**LTC 7541. Teaching Social Studies. 3 Credits.**

Is designed for the secondary social studies teachers to develop knowledge of social studies and the skills to teach social studies. The student will plan implement, and evaluate both the teaching and learning processes for secondary social studies classroom. Prerequisites: graduate standing and acceptance into Phase II, Term: Spring of junior year; admittance to College of Education required.

**LTC 7550. Assessment in Social Studies. 3 Credits.**

Will address the purposes and development of social studies assessment for all levels from classroom to national assessment. Assessment will be used to reflect upon curriculum/instruction, make revisions and set goals. Prerequisites: graduate standing and acceptance into Phase II, Term: Fall of senior year; admittance to College of Education required.

**LTC 7560. Teaching Reading in the Content Areas. 2-3 Credit.**

For secondary school teachers. Specific ways teachers can help students improve reading skills in content areas and ways reading can be taught in reading classes. Phase II admittance required. Restricted to graduate students.

**LTC 7570. Organization of Public School Art. 2 Credits.**

Purposes, practices of art experiences in elementary and secondary schools. Designed for teachers, supervisors, administrators. Prerequisite: graduate standing.

**LTC 7571. Introduction Teaching Mathematics in Middle and Secondary. 3 Credits.**

Introduction to teaching mathematics including: professional mathematics teacher associations and journals, learning theories related to teaching mathematics, tools, and materials for teaching mathematics, curriculum and instructional strategies (middle and lower high school level), and techniques for assessing mathematical understanding. Prerequisites: graduate standing and professional standing, Mathematics [MATH] 2300.

**LTC 7580. Social Studies in the Elementary School. 3 Credits.**

Problems in preparation, teaching of units with suitable materials, techniques. Prerequisites: graduate standing and Education, School and Counseling Psychology [ESC\_PS] 2400, professional standing.

**LTC 7581. Teaching Mathematics in Secondary Schools: Algebra. 3 Credits.**

Major issues/topics of the course are: exploration of curriculum, teaching strategies, and assessment for algebra and pre-calculus/calculus. Lesson planning, integration of appropriate models, mathematical connections, calculators and computer technology will be developed. Prerequisite: graduate standing and Teacher Development Program [TDP] 4570/7570; admittance to College of Education required.

**LTC 7587. Seminar in Curriculum and Instruction. 1-3 Credit.**

Prerequisite: graduate standing.

**LTC 7590. Teach.Math in Sec.Schools: Focus on Geometry, Probability & Stat.. 3 Credits.**

Provides experience which advanced students' knowledge, understanding, and facility in engaging students in learning mathematics. Major issues/topics highlighted in the course are: exploration of curriculum, teaching strategies, and assessment for geometry, probability and statistics. Prerequisite: Graduate Standing and Learning, Teaching and Curriculum [LTC] 4570/7570; admittance to College of Education required.

**LTC 7600. Diagnosis and Remediation of Learning Problems in Math-Middle. 3 Credits.**

The study of diagnostic and remedial instructional techniques for the teaching of mathematics. Emphasis is placed on alternative teaching methods and strategies. Prerequisite: graduate standing.

**LTC 7610. Teaching Techniques and Curriculum in Elementary School Math. 3 Credits.**

The mathematics program in the elementary school from viewpoint of goals, content, techniques and evaluation. Prerequisite: graduate standing.

**LTC 7620. Information Literacy in Teaching and Learning. 3 Credits.**

Discusses the nature, value, and power of information as product and process; organization, retrieval, and evaluation of information; explores the Internet and information superhighway; develops skills for resource based learning for classroom instruction; policy issues. Prerequisite: graduate standing.

**LTC 7630. Health Education in the Elementary School. 3 Credits.**

Defines teacher's role in school health program; investigates health needs of school children; focuses on teaching strategies, health resources and development of elementary school health education curricula and materials. Prerequisite: graduate standing.

**LTC 7631. Teach.Sci.Second.Sch.:Phil.,Hist., Sci.Inq.,Curr.,Assm., & Tech 3. 3 Credits.**

An integration of the philosophy and history of science, technology, society; teaching science as inquiry; classroom management, strategies and curricula for teaching/learning science; and using technology in science learning. Prerequisite: graduate standing and professional standing; admittance to College of Education required.

**LTC 7640. Motor Development in Early Childhood. 3 Credits.**

Motor development of infants and children with emphasis on: study of interaction between biological and environmental factors affecting development, motor assessment techniques, and designing programs to enhance motor development. Prerequisite: graduate standing and Education, School and Counseling Psychology [ESC\_PS] 2400.

**LTC 7641. Teaching Middle and Secondary Science II. 3 Credits.**

An integration of the philosophy and history of science, technology, society; teaching science as inquiry; classroom management, strategies and curricula for teaching/learning science; and using technology in science learning. Prerequisite: graduate standing and professional standing and Teaching Science in the Secondary School, Part I; admittance to College of Education required.

**LTC 7650. Education in Human Sexuality. 3 Credits.**

The biological, psychosocial and educational aspects of human sexuality with special emphasis on instructional activities related to interpersonal communication, decision-making ability and clarification of values, course is designed for both teachers and health-care personnel. Prerequisite:

graduate standing and Learning, Teaching and Curriculum [LTC] 1310 or equivalent.

**LTC 7651. Teach.Sci.Second.Sch.:Phil.,Hist.,Sci.Inq.,Curr.,Assm., & Tech 2. 3 Credits.**

An integration of the philosophy and history of science, technology, society; teaching science as inquiry; classroom management, strategies and curricula for teaching/learning science; and using technology in science learning. Prerequisite: graduate standing and professional standing and Teaching Science in the Secondary School, Parts 1 and II; admittance to College of Education required.

**LTC 7660. Drug Education. 3 Credits.**

The psychosocial, legal and pharmacological aspects of the recreational use of over-the-counter and street drugs are investigated with emphasis being placed on personal decision making, principles of school and community drug education, rehabilitation and community health services. Prerequisite: graduate standing.

**LTC 7680. Teaching Legal Rights and Responsibilities of Citizenship. 2 Credits.**

An introductory course for teachers and undergraduate students dealing with the teaching of the basic legal concepts which underlie effective citizenship. Prerequisite: graduate standing.

**LTC 7730. Overview of Art Education. 3 Credits.**

This is the first of a three course sequence and serves as the foundation for inquiries of methodological and philosophical approaches to the teaching of the visual arts at the elementary and secondary level. Prerequisite: graduate standing and admittance to College of Education required.

**LTC 7740. Inquiry into Art Education: Pre-School Through Middle School. 3 Credits.**

The second of three course sequence. It will cover art education issues as they apply to the Pre-School through Middle School setting. Prerequisite: graduate standing and admittance to College of Education required.

**LTC 7750. Inquiry into Art Education: Secondary. 3 Credits.**

The third of a three course sequence. Student will learn about secondary art education and make application to practice with emphasis on adolescent development, curriculum design, student assessment, instruction, diversity/equity, and professionalism. Prerequisite: graduate standing and admittance to College of Education required.

**LTC 7960. Special Readings in Curriculum and Instruction. 1-3 Credit.**

Directed study of literature and research reports in education.

**LTC 7971. Internship and Capstone Seminar. 1-16 Credit.**

Internship is a full-semester experience in the public schools, including a capstone seminar addressing problems of practice (integrating subjects, reading and writing across the curriculum, meeting all students' needs), and evaluation of the interns preparation for entering the profession. It is offered each Fall and Spring for 1-16 credit hours. Admittance to College of Education required. Prerequisites: Graduate Standing and Educational Leadership and Policy Analysis [ED\_LPA] 4060/7060 and admittance into Phase III.

**LTC 8085. Problems in Curriculum and Instruction. 1-99 Credit.**

Prerequisite: graduate standing.

**LTC 8520. Tests and Measurements for Elementary and Secondary Schools. 3 Credits.**

Educational tests, measurements from points of view of teachers, supervisors, administrators.

**LTC 8600. Perspectives in Parent Education/Parent Involvement. 3 Credits.**

Consideration of the history and the influences of social, economic, political and educational changes leading to the development of parent involvement program components in the education of children in the primary grades.

**LTC 8610. Issues in Early Childhood Education and Curriculum Practices. 3 Credits.**

Focuses on historical and contemporary societal and educational issues affecting current curriculum decisions and practices in kindergarten and primary grades. Prerequisites: Classroom teaching experience or instructor's consent.

**LTC 8612. Advanced Early Childhood Curriculum. 2-3 Credit.**

Study of early childhood curriculum in contemporary educational settings along with selection of appropriate materials and development of instructional strategies for children, prekindergarten through early primary grades. Prerequisites: teaching experience or instructor's consent.

**LTC 8615. The Missouri Writing Project. 3-4 Credit.**

Focus on 1) current theory and research in teaching writing; 2) development of effective practice in teaching, writing and reading; and 3) experimentation with writing and response. Prerequisites: successful application to MWP.

**LTC 8616. The Teaching of Journalism. 3 Credits.**

The course focuses on the learning and teaching of middle, secondary, and post-secondary journalism/mass media course. Major strands of study include the theory and practice of journalism instruction, curriculum, and assessment.

**LTC 8617. Teaching Writing in Middle and Secondary Classroom. 3 Credits.**

This course will encourage the student as a writer and as a teacher of writing, especially in the middle and high school setting. We will explore various types of writing, with emphasis in English Education, including addressing national and state standards. Prerequisite: graduate standing.

**LTC 8618. Writing, Reading and Teaching Nonfiction. 3 Credits.**

Students will get more than their feet wet as they read and write a variety of nonfiction texts, explore nonfiction's value and relationship to other genres, and investigate its potential for learning. Prerequisite: graduate standing.

**LTC 8619. Media Literacy. 3 Credits.**

Teachers will learn how to incorporate visual images in the classroom while helping students "read" the images of our media-rich culture. Teachers will pair media with literature; analyzed and evaluate different media; and design several assignments. Prerequisite: graduate standing.

**LTC 8620. Whole Language Curriculum. 3 Credits.**

Whole Language Curriculum inquires into whole language theory, beliefs and practices. Students will explore and participate in classroom based inquiry projects, theme cycles, reflective practices, holistic assessment, and other learner-centered experiences such as literature study and writers workshop.

**LTC 8621. Talk in the Curriculum. 3 Credits.**

This survey of oracy examines talk's essential role in learning and the connections among language, power and cultural identity. Graduate Standing Required.

**LTC 8630. Teaching Reading Through Literature Response. 3 Credits.**

Teaching Reading Through Literature Response focuses on 1) reading as a personal and social process and 2) multiple responses to literature. Students will examine, use and critique; personalized reading, text sets (conceptually related materials), literature groups and other reading instruction experiences.

**LTC 8635. Literature for Children and Youth. 3 Credits.**

Systematic study of selected areas of particular importance to students of literature, teachers, librarians, supervisors, and school administrators. Prerequisites: instructor's consent.

**LTC 8640. Studies in English Education. 3 Credits.**

Exploration of the theory, research, and application of topics in the teaching of English, such as Writing/Thinking, Media, Literature, Language, and Creative Nonfiction. Topics announced at time of registration. May repeat to twelve hours with department's approval.

**LTC 8642. Teaching Writing and Reading in Content Areas. 3 Credits.**

Theory and practice of teaching reading and writing. Specific ways teachers can help students use writing to communicate about the course content, as well as to learn course concepts. Class also focuses on how to teach reading in reading classes, how to help students improve reading skills in content areas, and how reading and writing skills can reinforce each other. Graduate standing required.

**LTC 8645. Second Language Acquisition. 3 Credits.**

This course will examine the many theories of how humans develop first and second languages and how this knowledge can be used to educate English Language Learners. Graded on A/F basis only. Prerequisites: graduate standing required. Students must hold a valid teaching certificate.

**LTC 8646. Materials for and Assessment of English Language Learners. 3 Credits.**

This course will examine the appropriate classroom materials for and the methods, reasons, and tools for the assessment of English Language Learners. Graded on A/F basis only. Prerequisite: graduate standing required. Students must hold a valid teaching certificate.

**LTC 8647. Language and Culture for Educators. 3 Credits.**

This course will examine how to prepare educators to effectively educate students from a broad range of linguistic and cultural backgrounds. Graded on A/F basis only. Prerequisites: graduate standing required. Students must hold a valid teaching certificate.

**LTC 8648. Linguistics for Educators. 3 Credits.**

This course will examine how knowledge of the way languages work will directly benefit the teaching of English Language Learners. Graded on A/F basis only. Graduate standing required. Students must hold a valid teaching certificate.

**LTC 8649. Methods of Teaching English Language Learners. 3 Credits.**

This course will examine how to prepare teachers to develop the investigative, decision-making, and reflective teaching skills needed to work with English Language Learners. Graded on A/F basis only.

Graduate standing required. Students must hold a valid teaching certificate.

**LTC 8650. English to Speakers of Other Languages Practicum. 3 Credits.**

This culminating course toward ESOL certification will apply the theory and practice of teaching English for Speakers of Other Languages (ESOL) to non-native speakers. Graded on A/F basis only. Graduate standing required. Students must hold a valid teaching certificate.

**LTC 8651. Working with English Language Learners with Special Needs. 3 Credits.**

The course will assist educators with the decision to refer or not to refer an English language learner to special education services while helping identify the general framework for considering their special needs and preparing a comprehensive continuum of services. Course graded on A/F basis only. Graduate Standing Required.

**LTC 8652. Seminar: English: Its Grammar and Place in the World. 3 Credits.**

The course will familiarize learners with the grammatical features of English that have contributed to its global proliferation, explore the varieties of English used around the world, and delve into the concept of English as a global means of communication. Course graded on A/F basis only. Graduate Standing Required.

**LTC 8660. Reading Miscue Analysis. 3 Credits.**

The process in which readers construct meaning by relating their socio-psycholinguistic backgrounds to discourse. 15 studied miscues (text deviations) are analyzed at several linguistic levels. A comprehension centered reading program is developed. Prerequisites: Learning, Teaching and Curriculum [LTC] 7540 and 7560, or equivalent.

**LTC 8664. Practicum in Child Study I. 3-5 Credit.**

Practicum experiences in diagnosing educational problems of school children. Prerequisites: T315 or T316, T318, Educational & Counseling Psychology A303.

**LTC 8665. Practicum in Child Study II. 3-5 Credit.**

Practicum experiences in applying remedial procedures to children with educational problems. Prerequisite: T415.

**LTC 8670. Analysis & Correction of Reading Disabilities. 3 Credits.**

Diagnostic and corrective procedures in reading instruction that may be used for clinical study. Prerequisites: Learning, Teaching and Curriculum [LTC] 7540 or instructor's consent.

**LTC 8680. Issues and Trends in Reading Instruction. 3 Credits.**

Provides intensive study of significant issues and current trends in reading on all instructional levels. Prerequisites: Learning, Teaching and Curriculum [LTC] 7540, 7560 or equivalents or instructor's consent.

**LTC 8681. Making a Difference for the Struggling Reader. 3 Credits.**

Will help explore ways to help readers who have been unable to achieve success in reading--will learn how to access and evaluate strategies students are currently using. Prerequisite: graduate standing.

**LTC 8682. Focus on Writing in the Classroom. 3 Credits.**

The course focuses on theory, research and practices in teaching writing in the elementary classroom (K-6) while developing a critical understanding of process methods to teach writing.

**LTC 8683. Celebrating Reading Through Good Books. 3 Credits.**

Many people can read but do not. This course will explore ways to make reading a joyful, exciting experience. Assignments will include reading

journal articles that will help students meet self determined goals. Sharing books will be an important part of this course.

**LTC 8684. Integrating Literacy and Technology. 3 Credits.**

This will be a seminar course in which the students explore definitions of literacy, theoretical frameworks of educational technology, and literature that investigates the effectiveness of integrating literacy and technology. The students will also examine and evaluate a range of software used to integrate literacy and technology. Prerequisite: graduate standing.

**LTC 8685. Literature Opportunities: Using Children's and Young Adult's Literature in the Classroom. 3 Credits.**

This class examines genres in children's and young adult literature (grades 1-9). In-depth look at the work of children's authors and illustrators; explore issues of censorship, gender, and culture. Graduate Standing Required.

**LTC 8686. Theory of Instructional Strategies. 3 Credits.**

The course investigates instructional strategies in K-12 and higher education classrooms and the theories behind those strategies. Content includes large and small group strategies, inquiry-based learning, student-centered and direct instruction, and differentiated instruction. Graduate Standing Required.

**LTC 8687. Literacy and the Internet (Grades K-12). 3 Credits.**

The internet offers a myriad of opportunities to engage K-12 students in meaningful, purpose-driven reading and writing. Students examine their own literacy programs, examine ways they can incorporate the internet, and create a classroom web site. Graduate Standing Required.

**LTC 8688. Nature of Literacy in a Digital World. 3 Credits.**

New literacies are required to successfully engage in professional, civic, and personal lives that are imbued with technology. Students examine the literacy skills required to proficiently read and write with text messages, blogs, wikis, social networks, and virtual worlds. Graduate Standing required.

**LTC 8710. Nature of Science and Science Teaching. 3 Credits.**

Examines philosophical, historical and sociological views of the nature of science and implications for science education policy and science instruction.

**LTC 8712. Inquiry and the Science Curriculum. 3 Credits.**

Examines inquiry as the foundation of the science curriculum. Includes study of exemplary programs and curriculum materials, and provides models for curriculum development in science education.

**LTC 8714. Research in Science Education. 3 Credits.**

Studies appropriate research methodologies and reviews research and selected readings in science education. Allows option for elementary or secondary emphasis for specific areas: life, physical or earth sciences. Prerequisite: undergraduate course in Science Education.

**LTC 8716. Trends and Issues in Science Education. 3 Credits.**

Provides intensive study of current trends and significant issues of science affecting both the elementary and secondary levels of science education. Prerequisite: undergraduate course in Science Education.

**LTC 8717. Teaching, Learning, & Research in Middle & Secondary School Sci.I. 3 Credits.**

Course I is for Post-Baccalaureate Majors seeking Middle and/or Secondary teacher certification. Prerequisites: graduate standing; Learning, Teaching and Curriculum [LTC] 8942. Graded on A/F basis only.

**LTC 8718. Teaching, Learning & Research Middle & Secondary School Sci.: II. 3 Credits.**

For Post-Baccalaureate Majors seeking Middle and/or Secondary teacher certification. Prerequisites: graduate standing; Learning, Teaching and Curriculum [LTC] 8942. Graded on A/F basis only.

**LTC 8719. Teaching, Learning, & Research Middle & Secondary. 3 Credits.**

For Post-Baccalaureate Majors seeking Middle and/or Secondary teacher certification. Prerequisites: graduate standing; Learning, Teaching and Curriculum [LTC] 8942. Graded on A/F basis only.

**LTC 8720. Advanced Teaching of Elementary Science. 3 Credits.**

A study of science curriculum and teaching in elementary school from viewpoint of research teaching strategies, evaluation, and developing trends. Prerequisites: teaching experience and science methods course.

**LTC 8722. Advanced Teaching of Secondary Science. 3 Credits.**

Studies secondary science curriculum and teaching from viewpoint of research strategies, teaching strategies, conceptual formats. Prerequisite: secondary science methods course.

**LTC 8724. College Science Teaching. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 8724). Study of learner characteristics, teaching strategies, and research findings related to teaching science at the post-secondary level.

**LTC 8725. Science Outreach: Public Understanding of Science. 1-2 Credit.**

(same as Biological Science [BIO\_SC] and Animal Science [AN\_SCI] 8725). Development of presentations to adult audiences on the science underlying issues of current interest. May be repeated for credit.

**LTC 8726. Integrating Science with Outreach. 1-6 Credit.**

(same as Biological Sciences [BIO\_SC] 8726). This course provides an opportunity for students to earn credit for outreach activities in the community. Students will capitalize on their area of study and scientific expertise in developing, implementing, and evaluating related outreach activities. May be repeated for credit.

**LTC 8730. Survey of Art Education. 3 Credits.**

Provides survey of the development of art education and problems in the field by means of a critical inquiry. Prerequisite: graduate standing.

**LTC 8735. Visual Literacy and Visual Culture. 3 Credits.**

This course will investigate the intersection between art and language, exploring the connections between visual media and the written word—how these two areas inform and enrich each other.

**LTC 8740. Curriculum in Art Education. 3 Credits.**

Advanced study of art education curricula, with option for elementary or secondary emphasis. Study of exemplary art programs, standards of quality, curriculum models, curriculum design and construction, concomitant instructional methods and evaluation. Prerequisite: graduate standing.

**LTC 8745. Visual Thinking Strategies I. 3 Credits.**

This course will introduce regular classroom and art educators to Visual Thinking Strategies theory and methodology, building practical VTS facilitation skills through structured guidance and feedback as each participant implements VTS lessons within his/her own teaching context.

**LTC 8750. Review of Research in Art Education. 3 Credits.**

Studies appropriate research methodologies and reviews research and selected readings in art education. Prerequisite: graduate standing.

**LTC 8760. The Secondary School Curriculum. 3 Credits.**

For secondary school principals, teachers, superintendents. Presents trends in curricular change, methods of curricular investigation.

**LTC 8770. Curriculum Construction for Secondary Schools. 3 Credits.**

Designed for those engaged in curriculum revision work and construction of new secondary school courses. Prerequisite: Learning, Teaching and Curriculum [LTC] 8760 or instructor's consent.

**LTC 8780. Managing Classrooms for Learning. 1-3 Credit.**

Theoretical assumptions, goals, and research that inform various approaches to classroom management advocated for practitioners. Includes strategies for conducting action research on classroom management. Prerequisites: An educational psychology course or instructor's consent.

**LTC 8790. Patterns for Instruction in Social Studies. 3 Credits.**

Presents and evaluates strategies for planning, teaching, and evaluating social studies in elementary and secondary schools.

**LTC 8800. Secondary Social Studies Curriculum. 3 Credits.**

Examines current theory, trends and practices in secondary social studies curriculum with a practicum in curriculum development.

**LTC 8805. Inquiry into K-12 History and Social Science. 3 Credits.**

this course is designed as a directed study on a topic in social studies content for the K-12 classroom. The focus of the course is on what is taught in social studies. Graded on A/F basis only.

**LTC 8806. Issues in the Social Studies Classroom. 3 Credits.**

This course is designed to provide an intensive study of current trends and significant issues in social studies that affect the social studies classroom.

**LTC 8810. Elementary Social Studies Curriculum. 3 Credits.**

An in-depth study of objectives, goals, patterns and practices in elementary social studies curriculum. Focus will be upon instructional strategies and materials and current trends influencing curriculum development.

**LTC 8820. Advanced Techniques in Music Education-General. 2-5 Credit.**

A review and evaluation of teaching/learning strategies in selected areas and levels of music instruction. Prerequisites: Music methods or instructor's consent.

**LTC 8823. Advanced Techniques in Music Education-Early Childhood. 2-5 Credit.**

A review and evaluation of teaching/learning strategies in selected areas and levels of music instruction. Prerequisites: Music methods or instructor's consent.

**LTC 8825. Administration and Supervision of Music Programs. 3 Credits.**

A study of the organization, management, and supervision of music programs. Prerequisite: instructor's consent.

**LTC 8830. Curriculum Materials in Music Education-General. 2-5 Credit.**

A development of critical abilities in evaluation and selection of music education materials. Section 1: Elementary; Section 2: Secondary Vocal; Section 3: Instrumental. Prerequisite: instructor's consent.

**LTC 8831. Curriculum Materials in Music Education-Vocal. 2-5 Credit.**

A development of critical abilities in evaluation and selection of music education materials. Section 1: Elementary; Section 2: Secondary Vocal; Section 3: Instrumental. Prerequisite: instructor's consent.

**LTC 8840. Foundations of Music Education. 3 Credits.**

A study of the history, philosophy and rationale of music education. Prerequisite: instructor's consent.

**LTC 8845. Techniques in Instrumental Music Teaching. 3 Credits.**

A practical study of the organization and instruction of class teaching, with demonstrations by instructor and class. Prerequisite: instructor's consent.

**LTC 8850. Teaching Vocal Music. 3 Credits.**

Studies in voice development techniques and the organization of choral programs.

**LTC 8860. Mathematics Curriculum. 3 Credits.**

Evolution of the mathematics curriculum during the 20th century will be studied. Emphasis will be given to examining major factors influencing the changing mathematics curriculum and their impact. Prerequisite: teaching experience or the instructor's consent.

**LTC 8861. Teaching, Learning & Research in Middle & Secondary School Math I. 3 Credits.**

Course I for Post-Baccalaureate Majors seeking Middle and/or Secondary teacher certification. Prerequisite: graduate standing. Graded on A/F basis only.

**LTC 8862. Teaching, Learning & Research Middle & Secondary School Math: II. 3 Credits.**

Course II for Post-Baccalaureate Majors seeking Middle and/or Secondary teacher certification. Prerequisite: Learning, Teaching and Curriculum [LTC] 8861, graduate standing; Corequisite: LTC 8942. Graded on A/F basis only.

**LTC 8863. Teaching, Learning, and Research Middle and Secondary Math III. 3 Credits.**

Course III for Post-Baccalaureate Majors seeking Middle and/or Secondary teacher certification. Prerequisite: Learning, Teaching and Curriculum [LTC] 8861, and 8862, graduate standing; CO-Requisite: LTC 8942. Graded on A/F basis only.

**LTC 8865. Assessment in Mathematics Education. 3 Credits.**

Examination of assessment practices and the accountability movement. Emphasis is placed on significant research findings in assessment and implications for planning, implementing, and evaluating mathematics instruction. Prerequisite: Education, School and Counseling Psychology [ESC\_PS] 7100 and teaching experience.

**LTC 8870. Mathematics Teaching and Teacher Education. 3 Credits.**

Recent developments and research findings in mathematics teaching and mathematics teacher education will be studied. Open to masters and doctoral students.

**LTC 8875. Technology and Mathematics Education. 3 Credits.**

This course will focus on effective uses of technology in mathematics teaching and learning. Participants will experience different electronic technologies including computers, graphing calculators, and calculator based laboratories. Open to masters and doctoral students.

**LTC 8880. Advanced Survey of Theories of Learning Mathematics. 3 Credits.**

This course is designed for students to explore historical and current cognitive theories that frame research in teaching and learning of mathematics. Prerequisite: Education, School and Counseling Psychology [ESC PS] 7350 or instructor's consent.

**LTC 8885. Using Manipulative Materials in Teaching Mathematics III. 2-3 Credit.**

Mathematics laboratory is developed and integrated with experiences in setting. Emphasis on materials for primary and intermediate grades.

**LTC 8890. Mathematics Education Research. 3 Credits.**

Examination of major research efforts and significant findings on learning and teaching mathematics. Emphasis will be placed on becoming knowledgeable of research and on developing wise consumers of research in mathematics education. Prerequisite: teaching experience or instructor's consent.

**LTC 8893. Integrating Instruction in Science and Mathematics, Grades 5-12. 2 Credits.**

This course is designed to help middle and secondary mathematics and science teachers enhance student understanding of mathematics and science through integration of the disciplines.

**LTC 8895. Advanced Methods of Teaching Secondary School Mathematics. 3 Credits.**

Discussion and application of theories of learning, strategies of instruction, curriculum development, evaluation techniques and research to secondary mathematics programs. Prerequisite: Mathematics Secondary School Teaching Experience or equivalent.

**LTC 8900. Seminar in Curriculum and Instruction. 1-3 Credit.**

Seminar in Curriculum and Instruction.

**LTC 8910. Individual Research. 1-3 Credit.**

Independent research not leading to thesis. Prerequisites: consent required.

**LTC 8915. Classroom Research-Learning, Teaching and Curriculum. 1-3 Credit.**

Study of original classroom research and theories of instruction leading to plans for personal research and theory development. Prerequisites: advanced graduate standing.

**LTC 8920. Classroom Research-Early Childhood and Elementary. 3 Credits.**

Study of original classroom research and theories of instruction leading to plans for personal research and theory development. Prerequisites: T448 and advanced graduate standing.

**LTC 8930. Ethnographic Research in Education. 3 Credits.**

Investigate practical aspects, nature, and assumptions of ethnographic research in education. Pilot study required. Prerequisites: Education, School and Counseling Psychology [ESC\_PS] 7170 or equivalent.

**LTC 8940. In-Service Course in Curriculum and Instruction. 1-99 Credit.**

Course work adapted to current vocational needs. Prerequisite: instructor's consent.

**LTC 8941. Internship in Curriculum and Instruction. 1-99 Credit.**

Provides internship experience under supervision in advanced levels of curriculum and instruction. Prerequisite: departmental chairman's consent.

**LTC 8942. Advanced Internship in Curriculum and Instruction. 1-10 Credit.**

This internship is for students enrolled in MU COE Post-Baccalaureate Certification Programs. Prerequisite: instructor's consent. Graded on A/F basis only.

**LTC 8970. The Supervision of Student Teaching-Masters. 3 Credits.**

Theory, knowledge and practices involved in supervision of student teaching and other professional lab experiences. Offers assistance in all major aspects of supervision of student teaching.

**LTC 9090. Research in Curriculum and Instruction. 1-99 Credit.**

Graded on a S/U basis only.

**LTC 9970. The Supervision of Student Teaching-Doctoral. 3 Credits.**

Theory, knowledge and practices involved in supervision of student teaching and other professional lab experiences. Offers assistance in all major aspects of supervision of student teaching.

## **Learning, Teaching, & Curriculum - Vocational (LTC\_V)**

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**LTC\_V 1050. Principles of Sales. 3 Credits.**

Provide the student with the concepts, tools and skills to become a professional salesperson. Emphasis is placed upon participation and performance of sales skills.

**LTC\_V 1070. Keyboarding and Word Processing Concepts. 3 Credits.**

Instruction in mastering the keyboard and operative parts of a microcomputer. Preparation of business communications: reports; and legal; medical; and government documents. Special emphasis on developing high standards of keyboarding speed and accuracy.

**LTC\_V 1110. Principles of Retailing. 3 Credits.**

Examines problems, opportunities and trends in retailing. Problems and cases deal with store organization, budgeting, control, personnel and operation.

**LTC\_V 1210. Introduction to Microcomputers. 1 Credit.**

An overview of the hardware and software components of a microcomputer system.

**LTC\_V 2050. Merchandising. 3 Credits.**

Develop basic competencies essential to successful merchandising. Studies skills essential in merchandising, and analysis of merchandising functions and activities.

**LTC\_V 2110. Business and Interpersonal Communications. 3 Credits.**

Study of communication theory and principles as applied to business situations and practices; development of communications skills in the area of communication such as speaking, writing, listening, and nonverbal communication.

**LTC\_V 2150. The Virtual Workplace. 3 Credits.**

Encompasses the management of alternative work environments and the unique situations that arise by addressing the use of email, computerized meetings, virtual office design, web page issues for business, and other technology for virtual work.

**LTC\_V 3110. Field Experiences in PAVTE. 1-4 Credit.**

Supervised observational and instructionally related activities within one of the PAVTE program areas at the secondary or postsecondary level.

Student participates 30 clock hours for each semester hour of credit. Graded on S/U basis only.

**LTC\_V 3150. Directed Occupational Experience. 1-4 Credit.**

Reports based on employment experience in selected occupations combined with related conferences and/or seminars. May repeat until four semester hours accumulated.

**LTC\_V 3510. Human Relations in Organizations. 3 Credits.**

Principles, theory, processes and problems of effective human relations in marketing organizations.

**LTC\_V 4085. Problems in Curriculum and Instruction - CTE. 1-99 Credit.**

Study of professional programs and issues or technical problems related to the field of career and technical education.

**LTC\_V 4387. Seminar in Workforce Education. 1-3 Credit.**

Seminar experiences for students in any workforce education discipline area; meets the capstone requirement for students in the Bachelor of Educational Studies program (minimum 2.0 credit hours). Prerequisite: instructor's consent.

**LTC\_V 4510. Coordination of Cooperative Occupational Education. 3 Credits.**

Problems and procedures in the operation of cooperative occupational education programs. Especially designed for those who can qualify as coordinators of occupational education programs of a cooperative nature.

**LTC\_V 4550. Utility Software for Microcomputers. 2 Credits.**

An introduction to major types of microcomputer utility programs, including desktop publishing, presentation, spreadsheet, and data base. Prerequisite: Learning, Teaching and Curriculum - Vocational [LTC\_V] 1210 or equivalent.

**LTC\_V 4570. Career Guidance. 2-3 Credit.**

Problems, methods, and procedures involved in assisting individuals in choosing, preparing for, entering upon, and progressing in their career. For workforce development and human resource professionals, employment counselors, and teachers, counselors, and school administrators.

**LTC\_V 4610. Field Study in Occupational Education. 1-4 Credit.**

Directed observation in a cross section of business and industry combined with reports, weekly seminars and/or conferences. May repeat until four semester hours accumulated.

**LTC\_V 4650. Document Planning and Design. 3 Credits.**

Using the hands-on approach, students will develop skills in the planning, design layout, and creation of various business documents, as well as the ability to evaluate various types of documents. Prerequisite: Learning, Teaching and Curriculum -Vocational [LTC\_V] 4550 or equivalent.

**LTC\_V 4710. Business Software Applications. 3 Credits.**

Advanced concepts, features, and applications central to the major types of business software--spreadsheets, database management, word processing, graphics, and communications. Prerequisite: Learning, Teaching and Curriculum -Vocational [LTC\_V] 4550/7550 or equivalent.

**LTC\_V 4750. Occupational Analysis. 2 Credits.**

Techniques, procedures of analyzing occupations into their basic elements. Required of trade teachers, coordinators.

**LTC\_V 4770. Methods in Vocational Education for the Disabled and Disadvantaged. 3 Credits.**

(same as Special Education [SPC\_ED] 4390). Study of legislation, interagency cooperation, curriculum, transition, evaluation/grading role of



support personnel. For educators, counselors and administrators working in vocational settings with special needs students and students with disabilities.

**LTC\_V 4780. Development and Assessment of Workforce Education Curriculum. 3 Credits.**

Curriculum development and assessment course focused on competencies, curriculum selection, organization, development, and assessment for instructors of workforce and professional education courses and human resource training programs. Educational, School and Counseling Psychology [ESC\_PS] 2400 and junior standing.

**LTC\_V 4790. Laboratory Planning and Management. 3 Credits.**

This course is designed to acquaint the student with the procedures, techniques and skills necessary for proper organization, management, care, and utilization of career and technical education facilities, programs, equipment, and materials. Prerequisites: Learning, Teaching and Curriculum -Vocational [LTC\_V] 1210 and 4550.

**LTC\_V 4801. Topics in Career and Technical Education. 1-99 Credit.**

Topics in the field of career and technical education and the CTE program areas.

**LTC\_V 4805. Principles of Leadership in the Workplace. 3 Credits.**

Course explores the foundational concepts of leadership and its impact on the organizational behavior of individuals in the workplace. Theories of leadership will be examined, and concepts will be applied to workplace situations based on differing organizational factors. Course graded on A/F basis only.

**LTC\_V 4811. Workforce Education Teaching Methods. 3 Credits.**

Develops specialized organization and administration capabilities for workforce education subjects. Topics include managing activities, individualized instruction, nontraditional students, students with disabilities, and emerging technologies. Prerequisite: senior standing.

**LTC\_V 4830. Curriculum Content in Marketing Education. 3 Credits.**

Curricular development process, knowledge of core area and competencies of Marketing Education Program. Selection of instructional material. Prerequisite: Educational, School and Counseling Psychology [ESC\_PS] 2400.

**LTC\_V 4840. Methods of Teaching Marketing Education. 3 Credits.**

Instructional materials, methods and techniques used to teach the marketing education curriculum. Includes evaluating delivery of instruction. Prerequisite: Learning, Teaching and Curriculum -Vocational [LTC\_V] 4780 and 4830.

**LTC\_V 7083. Teaching Personal Finance Literacy. 3 Credits.**

(same as Personal Financial Planning [FINPLN] 7083) Principles and practices of teaching personal finance with particular emphasis on income, money management, spending and credit, and savings and investing. Prerequisites: Graduate standing. Course graded on A/F basis only.

**LTC\_V 7085. Problems in Curriculum and Instruction-CTE. 1-99 Credit.**

Study of professional programs and issues or technical problems related to the field of career and technical education. Graduate Standing Required.

**LTC\_V 7387. Seminar in Career and Technical Education. 1-3 Credit.**

Seminar experiences for students within one of the career and technical education areas. Prerequisite: instructor's consent.

**LTC\_V 7510. Coordination of Cooperative Occupational Education. 3 Credits.**

Problems and procedures in the operation of cooperative occupational education programs. Especially designed for those who can qualify as coordinators of occupational education programs of a cooperative nature. Prerequisite: graduate standing.

**LTC\_V 7550. Utility Software for Microcomputers. 2 Credits.**

An introduction to major types of microcomputer utility programs, including desktop publishing, presentation, spreadsheet, and data base. Prerequisite: graduate standing and Learning, Teaching and Curriculum-Vocational [LTC\_V] 1210 or equivalent.

**LTC\_V 7570. Vocational Guidance. 2-3 Credit.**

Problems, methods, procedures involved in assisting individuals in choosing, preparing for, entering upon, progressing in their vocation. For teachers, counselors, school administrators. Prerequisite: graduate standing.

**LTC\_V 7610. Field Study in Occupational Education. 1-4 Credit.**

Directed observation in a cross section of business and industry combined with reports, weekly seminars and/or conferences. May repeat until four semester hours accumulated. Prerequisite: graduate standing.

**LTC\_V 7650. Document Planning and Design. 3 Credits.**

Using the hands-on approach, students will develop skills in the planning, design layout, and creation of various business documents, as well as the ability to evaluate various types of documents. Prerequisite: graduate standing and Learning, Teaching and Curriculum-Vocational [LTC\_V] 4550/7550 or equivalent.

**LTC\_V 7710. Business Software Applications. 3 Credits.**

Advanced concepts, features, and applications central to the major types of business software--spreadsheets, database management, word processing, graphics, and communications. Prerequisite: graduate standing and Learning, Teaching and Curriculum-Vocational [LTC\_V] 4550/7550 or equivalent.

**LTC\_V 7750. Occupational Analysis. 2 Credits.**

Techniques, procedures of analyzing occupations into their basic elements. Required of trade teachers, coordinators. Prerequisite: graduate standing.

**LTC\_V 7770. Methods in Vocational Education for the Disabled & Disadvantaged. 3 Credits.**

(same as Special Education [SPC\_ED] 4390). Study of legislation, interagency cooperation, curriculum, transition, evaluation/grading role of support personnel. For educators, counselors and administrators working in vocational settings with special needs students and students with disabilities. Prerequisite: graduate standing.

**LTC\_V 7780. Development & Assessment of Vocational-Technical Curriculum. 3 Credits.**

Curriculum development/assessment course focused on competencies, curriculum selection, organization, development, and assessment in the context of the Missouri Vocational Instructional Management System. Prerequisite: graduate standing and Education, School and Counseling Psychology [ESC\_PS] 2400.

**LTC\_V 7790. Laboratory Planning and Management. 3 Credits.**

This course is designed to acquaint the student with the procedures, techniques and skills necessary for proper organization, management, care, and utilization of career and technical education facilities, programs, equipment, and materials. Prerequisites: graduate standing and Learning, Teaching and Curriculum-Vocational [LTC\_V] 1210 and 7550.

**LTC\_V 7801. Topics in Career and Technical Education. 1-99 Credit.**

Topics in the field of career and technical education and the CTE program areas. Graduate Standing Required.

**LTC\_V 7810. Technology and Industry Education Methods. 3 Credits.**

Develops specialized organization and administration capabilities for Industrial and Technology Education. Topics include managing activities, individualized instruction, nontraditional students, students with disabilities, and emerging technologies. Prerequisite: professional standing and graduate standing.

**LTC\_V 7830. Curriculum Content in Marketing Education. 3 Credits.**

Curricular development process, knowledge of core area and competencies of Marketing Education Program. Selection of instructional material. Prerequisite: graduate standing and Education, School and Counseling Psychology [ESC\_PS] 2400.

**LTC\_V 7840. Methods of Teaching Marketing Education. 3 Credits.**

Instructional materials, methods and techniques used to teach the marketing education curriculum. Includes evaluating delivery of instruction. Prerequisite: graduate standing Learning, Teaching and Curriculum-Vocational [LTC\_V] 7780 and 7830.

**LTC\_V 8085. Problems in Workforce and Professional Education. 1-99 Credit.**

Independent, directed study on a topic in the areas of workforce, professional, or technology education.

**LTC\_V 8190. Research Applications for Career and Technical Education. 3 Credits.**

Interpretation, evaluation, and application of research methodologies and findings in career and technical education.

**LTC\_V 8210. Foundations of Program Development in Adult Workforce Education. 3 Credits.**

The adult workforce and professional education movement; characteristics of and learning principles applied to adult students; instructional materials, methods and procedures in organizing and operating adult vocational education programs.

**LTC\_V 8250. Principles of Business and Marketing Education Methods. 3 Credits.**

Organization, curriculum, problems, and trends of business and marketing education in secondary schools and colleges. Prerequisites: Teacher Development Program [TDP] 4880/7880 or instructor's consent.

**LTC\_V 8287. Seminar in Career and Technical Education. 1-3 Credit.**

Seminar in Career and Technical Education.

**LTC\_V 8310. Foundations of Career and Technology Education. 3 Credits.**

Nature, purpose of practical arts and vocational education in modern school. For teachers of agriculture, business, home economics, industrial subjects, administrators.

**LTC\_V 8350. Curriculum Development for Workforce and Professional Education. 3 Credits.**

In-depth investigation of curriculum development theory, research, issues, and procedures for workforce and professional education in the public and private sectors. Prerequisites: graduate standing or instructor's consent.

**LTC\_V 8410. Improvement of Instruction in Using Technology. 3 Credits.**

Incorporates recent development in application of technology to methods, techniques, and materials of instruction in career and technical education classrooms and laboratories. Prerequisites: Learning, Teaching and Curriculum-Vocational [LTC\_V] 4550/7550 or instructor's consent.

**LTC\_V 8420. Improvement of Instruction in Business Skills Subjects. 3 Credits.**

Developments and trends in the instructional program of business skills courses.

**LTC\_V 8501. Topics in Workforce and Professional Education. 1-99 Credit.**

Topics in the field of workforce, professional, or technology education in the CTE program areas. Prerequisite: graduate standing.

**LTC\_V 8510. Evaluation in Workforce and Professional Education. 3 Credits.**

Development of evaluation procedures and the construction of evaluation devices for workforce and professional education. Emphasizes performance evaluation, improvement of instruction, and program review. Prerequisites: graduate standing or instructor's consent.

**LTC\_V 8520. Implementation and Administration of Career and Technical Education Program. 3 Credits.**

Types of organization, approved administrative and supervisory practices, and state and federal guidelines for programs of career and technical education. Prerequisite: graduate standing or instructor's consent.

**LTC\_V 8940. In-Service Course in Vocational-Technical Education. 1-99 Credit.**

In-Service Course in Vocational-Technical Education.

**LTC\_V 9090. Research in Practical Arts and Vocational Technology Education. 1-99 Credit.**

Graded on a S/U basis only.

## Linguistics (LINGST)

**LINGST 1060. Human Language. 3 Credits.**

(same as Anthropology [ANTHRO] 1060, Communication Science and Disorders [C\_S\_D] 1060, English [ENGLSH] 1060) General introduction to various aspects of linguistic study. Elementary analysis of language data, with some attention to application of linguistic study to other disciplines.

**LINGST 2001. Topics in Linguistics-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: consent of chair.

**LINGST 2040. Anthropological Linguistics. 3 Credits.**

(same as Anthropology [ANTHRO] 2040). Language in relation to other aspects of human behavior. Introduction to description and analysis of the basic units of language. Emphasis on non-Indo-European and preliterate languages. Prerequisites: sophomore standing recommended.

**LINGST 2700. Elementary Logic. 3 Credits.**

(same as Philosophy [PHIL] 2700). Introduces a symbolic language for representing the structure of arguments. Presents precise rules for demonstrating the validity of arguments. Covers natural deduction for sentence and predicate logic. Develops skill in constructing derivations. Prerequisite: grade of C or higher in Mathematics [MATH] 1100/1120 or equivalent.

**LINGST 2820. Introduction to Cognitive Science. 3 Credits.**

(same as Psychology [PSYCH] 2820 and Philosophy [PHIL] 2820). Cognitive science is the interdisciplinary study of the mind. After an overview of the foundations of cognitive science as a whole, we will see what particular sectors of it have to say about mental capacities such as vision, language, categorization, and social cognition. Prerequisites: Psychology [PSYCH] 1000: sophomore standing required.

**LINGST 3001. Topics in Linguistics-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: consent of chair.

**LINGST 3010. American Phonetics. 3 Credits.**

(same as Communication Science and Disorders [C\_S\_D] 3010). Analysis of production and acoustics of the sounds of speech with an emphasis on American English; practice in broad and narrow transcription using the International Phonetic Alphabet.

**LINGST 3210. Anatomy and Physiology of the Speech Mechanism. 3 Credits.**

(same as Communication Science and Disorder [C\_S\_D] 3210). Introduction to anatomical and functional aspects of the speech mechanism. Prerequisite: must be taken concurrently with Communication Science and Disorder [C\_S\_D]/Linguistics [LINGST] 3220.

**LINGST 3220. Speech Acoustics. 2 Credits.**

(same as Communication Science Disorders [C\_S\_D] 3220). An introduction to the acoustic aspects of speech as they relate to the respiratory, phonatory, resonatory, and articulatory systems. Prerequisites: Must be taken concurrently with Communication Science and Disorders [C\_S\_D] 3210.

**LINGST 3470. Culture as Communication. 3 Credits.**

(same as Anthropology [ANTHRO] 3470, Communication [COMMUN] 3470). Study of the influence of culture on communication processes. Examines topics such as the impact of values, languages, and nonverbal behavior on intercultural interaction. Prerequisites: sophomore standing.

**LINGST 3710. Survey of Minority and Creole Languages of the U.S. and the Caribbean. 3 Credits.**

(same as Spanish [SPAN] 3710 and French [FRENCH] 3710). Analysis of the state of the minority languages of the U.S. and the Creole languages of the Caribbean with particular attention to the social status of these languages and speakers' attitudes toward them in context of ethnic, cultural, and national identity (taught in English). Prerequisite: sophomore standing.

**LINGST 3721. Spanish Phonetics. 3 Credits.**

(same as Spanish [SPAN] 3721). Introductory course to the study of Spanish phonological, phonetic and spelling systems, practice of pronunciation, phonetic transcriptions, and introduction to the variation of Spanish pronunciation in the Hispanic world. The course is conducted in Spanish. Prerequisite: Spanish [SPAN] 2160 or equivalent.

**LINGST 4001. Topics in Linguistics-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: consent of chair.

**LINGST 4100. Philosophy of Language. 3 Credits.**

(same as Philosophy [PHIL] 4100). Examination of contemporary views of the relationship between language, minds, and the world. Prerequisite: sophomore standing and Philosophy [PHIL] 2700 and one other course in Philosophy; or instructor's consent.

**LINGST 4110. Advanced Logic. 3 Credits.**

(same as Philosophy [PHIL] 4110). Presents the method of truth trees for sentence and predicate logic. Examines proofs concerning the decidability, soundness, and completeness of formal systems. Emphasizes the theory of formal systems. Prerequisite: sophomore standing and Philosophy [PHIL] 2700; or instructor's consent.

**LINGST 4200. Introduction to Old English. 3 Credits.**

(same as English [ENGLSH] 4200). A beginning study of the Old English or Anglo-Saxon language in its cultural context, with emphasis on gaining a reading knowledge. Prerequisite: junior standing.

**LINGST 4400. Language and Culture. 3 Credits.**

(same as Anthropology [ANTHRO] 4400). Interrelations between language, thought, culture, and society; role of language in cognition; methods and concepts of linguistics in cultural analysis. Prerequisite: Anthropology [ANTHRO] / Linguistics [LINGST] 2040 or instructor's consent.

**LINGST 4412. Gender, Language and Communication. 3 Credits.**

(same as Communications [COMMUN] 4412 and Anthropology [ANTHRO] 4412). Relationships among gender, language, nonverbal communication, and culture. Prerequisite: junior standing or departmental consent.

**LINGST 4415. Language and Discourse. 3 Credits.**

(same as Communication [COMMUN] 4415). Analysis of the rules of social interaction and the functions of language in discourse.

**LINGST 4420. Historical Linguistics. 3 Credits.**

(same as Anthropology [ANTHRO] 4420). Methods of tracing the history of languages by glottochronology, and by comparative and internal reconstructions; cultural and linguistic implications of such reconstructions and of areal linguistics. Prerequisites: junior/senior standing or instructor's consent.

**LINGST 4600. Structure of American English. 3 Credits.**

(same as English [ENGLSH] 4600). Introduction to English linguistics. Study of the grammar and pronunciation of contemporary English, with the major focus on syntax. Prerequisite: junior standing.

**LINGST 4610. History of the English Language. 3 Credits.**

(same as English [ENGLSH] 4610). Historical changes in the grammar and pronunciation of the English language from Old English to the present. Introduction to Indo-European origins of English.

**LINGST 4620. Regional and Social Dialects of American English. 3 Credits.**

(same as English [ENGLSH] 4620). The study of regional and social variation in pronunciation, vocabulary, and syntax of American English. Prerequisite: Linguistics [LINGST] 4600 and 4610 or equivalent.

**LINGST 4630. Phonology. 3 Credits.**

(same as English [ENGLSH] 4630). Survey of the sound patterns of English, with some comparison to other languages. Prerequisite: Linguistics [LINGST] 4600 or another introductory course in linguistics or phonetics.

**LINGST 4640. Syntax. 3 Credits.**

(same as English [ENGLSH] 4640). Study of the properties of phrase and sentence-level grammar, emphasizing English, with some comparison to other languages. Prerequisite: Linguistics [LINGST] 4600 or another comparable linguistics course.

**LINGST 4650. Principles of Teaching English as a Second Language. 3 Credits.**

(same as English [ENGLSH] 4650 and Learning, Teaching and Curriculum [LTC] 4460). Linguistic and pedagogical principles of teaching English to speakers of other languages. Prerequisite: Linguistics [LINGST] 4600 and 4610 or equivalent.

**LINGST 4710. History of the French Language. 3 Credits.**

(same as French [FRENCH] 4710). Study of the French language from its Latin origin to the present. The course includes a survey of the external, social, political, and historical factors that have affected the development of French, followed by diachronic study of the internal structural features of the language. Prerequisites: French [FRENCH] 3420 and 3430.

**LINGST 4711. History of the Spanish Language. 3 Credits.**

(same as Spanish [SPAN] 4711). Diachronic analysis of phonological, morphological, and syntactical systems of Spanish, from Vulgar Latin to contemporary dialects. Prerequisite: Completed with passing grade any Linguistics course 3000 or above or by consent of instructor. Recommended: Spanish [SPAN] 3420 and 3430.

**LINGST 4720. Structure of Modern French. 3 Credits.**

(same as French [FRENCH] 4720). An introductory presentation of the phonological and syntactic systems of contemporary standard French. Prerequisites: French [FRENCH] 3160 or equivalent or instructor's consent.

**LINGST 4721. Structure of Modern Spanish. 3 Credits.**

(same as Spanish [SPAN] 4721). Synchronic analysis of phonology, morphology and syntax of spoken Spanish dialects. Prerequisites: four 3000-level courses in Spanish.

**LINGST 4722. Spanish Across the Continents. 3 Credits.**

(same as Spanish [SPAN] 4722). This course focuses on the effects of migratory movements on language change, considering the Spanish spoken in Latin America, Puerto Rico, Spain and the USA. The class sharpens awareness and recognition of the linguistic diversity of the Spanish-speaking regions of the world. Graded on A/F basis only. Prerequisites: four 3000-level courses in Spanish.

**LINGST 4723. Language and Society: Spanish in the U.S.. 3 Credits.**

(same as Spanish [SPAN] 4723). This class surveys linguistic and social issues pertaining to Spanish in the U.S. (past, present and future). Topics include bilingualism, code switching (a.k.a. Spanglish), first language attrition, linguistic identity, and the role of Spanish in Education, services and media. Graded on A/F basis only. Prerequisites: four 3000-level courses in Spanish.

**LINGST 4730. Linguistic Theory and Language Acquisition. 3 Credits.**

The goal of this class is to study the implications of current linguistic theory for contemporary research on second language acquisition. In particular, the hypothesis that second language acquisition follows some of the same principles as first language acquisition is explored. Course is taught in English. Prerequisites: Linguistics [LINGST] 4720, 4721, 4600, or 4860.

**LINGST 4810. Psycholinguistics. 3 Credits.**

(same as Communication Science and Disorder [C\_S\_D] 4810). Examination of the knowledge and processes that underlie the human ability to produce and understand language. Prerequisite: instructor's consent.

**LINGST 4820. Speech Perception. 3 Credits.**

(same as Communication Science and Disorders [C\_S\_D] 4820). Selected topics in the perceptual processing of spoken language. Prerequisite: senior standing.

**LINGST 4850. Practical Phonetics for Fieldwork. 3 Credits.**

(same as Anthropology [ANTHRO] 4850). Self-paced course using computer and tape recorded lessons from world's languages. Teaches practical articulatory and transcription phonetics. Weekly meeting with instructor to monitor progress, resolve questions. Prerequisites: junior standing or instructor's consent.

**LINGST 4860. Techniques in Linguistic Analysis. 3 Credits.**

(same as Anthropology [ANTHRO] 4860). Problems in analyzing data from various languages. Prerequisites: introductory course in Linguistics or instructor's consent.

**LINGST 4870. Field Methods in Linguistics. 4 Credits.**

(same as Anthropology [ANTHRO] 4870 and English [ENGLSH] 4670). Intensive training in collection and analysis of data taken from a native speaker of non-Indo-European language. Prerequisites: 9 hours in Linguistics [LINGST] or instructor's consent.

**LINGST 4960. Special Readings in Linguistics. 1-3 Credit.**

Independent study through readings, conferences, reports. Prerequisites: 9 hours in Linguistics and instructor's consent.

**LINGST 4970. Studies in Linguistics. 3 Credits.**

Topic varies according to instructor. Prerequisite: 9 hours in Linguistics.

**LINGST 4991. Honors Thesis in Linguistics. 3 Credits.**

Based on an original research project in theoretical or applied linguistics. Topic, director, and second reader approved by Linguistics Committee, College of Arts & Science. Prerequisite: qualification for Honors degree.

**LINGST 7100. Philosophy of Language. 3 Credits.**

(same as Philosophy [PHIL] 7100). Examination of contemporary views of the relationship between language, minds, and the world. Prerequisite: Philosophy [PHIL] 2700 or instructor's consent. Some work in PHIL 1000, 3000 or 3200 recommended.

**LINGST 7110. Formal Logic. 3 Credits.**

(same as Philosophy [PHIL] 7110). Presents the method of truth trees for sentence and predicate logic. Examines proofs concerning the decidability, soundness, and completeness for formal systems. Emphasizes the theory of formal systems. Prerequisites: graduate standing and Philosophy [PHIL] 2700.

**LINGST 7200. Introduction to Old English. 3 Credits.**

(same as English [ENGLSH] 7200). A beginning study of the Old English or Anglo-Saxon language in its cultural context, with emphasis on gaining a reading knowledge. Prerequisite: graduate standing.

**LINGST 7400. Language and Culture. 3 Credits.**

(same as Anthropology [ANTHRO] 7400). Interrelations between language, thought, culture, and society; role of language in cognition; methods and concepts of linguistics in cultural analysis. Prerequisite: graduate standing and Anthropology/Linguistics [ANTHRO/LINGST] 2040 or equivalent.

**LINGST 7412. Gender, Language, and Communication. 3 Credits.**

(same as Communications [COMMUN] 7412 and Anthropology [ANTHRO] 7412). Relationships among gender, language, nonverbal communication, and culture.

**LINGST 7415. Language and Discourse. 3 Credits.**

(same as Communication [COMMUN] 7415). Analysis of the rules of social interaction and the functions of language in discourse.

**LINGST 7420. Historical Linguistics. 3 Credits.**

(same as Anthropology [ANTHRO] 7420). Methods of tracing the history of languages by glottochronology, and by comparative and internal reconstructions; cultural and linguistic implications of such reconstructions and of areal linguistics.

**LINGST 7600. Structure of American English. 3 Credits.**

(same as English [ENGLSH] 7600). Introduction to English linguistics. Study of the grammar and pronunciation of contemporary English, with the major focus on syntax. Prerequisite: graduate standing.

**LINGST 7610. History of the English Language. 3 Credits.**

(same as English [ENGLSH] 7610). Historical changes in the grammar and pronunciation of the English language from Old English to the present. Introduction to Indo-European origins of English.

**LINGST 7620. Regional and Social Dialects of American English. 3 Credits.**

(same as English [ENGLSH] 7620). The study of regional and social variation in pronunciation, vocabulary, and syntax of American English. Prerequisite: Linguistics [LINGST] 4760/7600 and 7610 or equivalent.

**LINGST 7630. Phonology. 3 Credits.**

(same as English [ENGLSH] 7630). Survey of the sound patterns of English, with some comparison to other languages. Prerequisite: Linguistics [LINGST] 7600 or another introductory course in linguistics or phonetics.

**LINGST 7640. Syntax. 3 Credits.**

(same as English [ENGLSH] 7640). Study of the properties of phrase-and sentence-level grammar, emphasizing English, with some comparison to other languages. Prerequisite: graduate standing and Linguistics [LINGST] 4600 or another comparable linguistics course.

**LINGST 7650. Principles of Teaching English as a Second Language. 3 Credits.**

(same as English [ENGLSH] 7650). Linguistic and pedagogical principles of teaching English to speakers of other languages. Prerequisite: Linguistics [LINGST] 7600 and 7610 or equivalent.

**LINGST 7710. History of the French Language. 3 Credits.**

(same as French [FRENCH] 7710). Prerequisites: graduate standing.

**LINGST 7711. History of the Spanish Language. 3 Credits.**

(same as Spanish [SPAN] 7711). Diachronic analysis of Spanish phonology, morphology, and syntax from Vulgar Latin to modern period. Prerequisite: completed with passing grade any Linguistics course 3000 or above or by instructor's consent.

**LINGST 7720. Structure of Modern French. 3 Credits.**

(same as French [FRENCH] 7720). An introductory presentation of the phonological and syntactic systems of contemporary standard French.

**LINGST 7721. Structure of Modern Spanish. 3 Credits.**

(same as Spanish [SPAN] 7721). Synchronic analysis of phonology morphology and syntax of spoken Spanish dialects.

**LINGST 7730. Linguistic Theory and Language Acquisition. 3 Credits.**

(same as Romance Languages [RM\_LAN] 7730). The goal of this class is to study the implications of current linguistic theory for contemporary research on second language acquisition. In particular, the hypothesis that second language acquisition follows some of the same principles

as first language acquisition is explored. Course is taught in English. Prerequisites: Linguistics [LINGST] 7720, 7721, 7600 or 7860.

**LINGST 7810. Psycholinguistics. 3 Credits.**

(same as Communication Science and Disorders [C\_S\_D] 7810). Examines the knowledge and processes that underlie the human ability to produce and understand language. Prerequisite: graduate standing and instructor's consent.

**LINGST 7820. Speech Perception. 3 Credits.**

(same as Communication Science and Disorders [C\_S\_D] 7820). Selected topics in the perceptual processing of speech sounds and spoken language. Prerequisite: instructor's consent.

**LINGST 7850. Practical Phonetics for Fieldwork. 3 Credits.**

(same as Anthropology [ANTHRO] 7850). Self-paced course using computer and tape recorded lessons from world's languages. Teaches practical articulatory and transcription phonetics. Weekly meeting with instructor to monitor progress, resolve questions.

**LINGST 7860. Techniques in Linguistic Analysis. 3 Credits.**

(same as Anthropology [ANTHRO] 7860). Problems in analyzing data from various languages. Prerequisite: introductory course in Linguistics or instructor's consent.

**LINGST 7870. Field Methods in Linguistics. 4 Credits.**

(same as Anthropology [ANTHRO] 7870 and English [ENGLSH] 7670). Intensive training in collection and analysis of data taken from a native speaker of non-Indo-European language. Prerequisites: 9 hours in Linguistics.

**LINGST 8000. Problems. 3 Credits.**

Independent study through readings, analysis of special linguistic problems, reports. Prerequisites: one Advanced Linguistics course and instructor's consent.

**LINGST 8100. Speech Science. 4 Credits.**

(same as Communication Science and Disorders [C\_S\_D] 8100). Introduction to the physiological and acoustic aspects of speech production; instrumentation for speech analysis including computer-based speech processing techniques. Prerequisites: Communication Science and Disorders [C\_S\_D] 3010, 3210, and 3230 or equivalents. Graduate Standing Required.

**LINGST 8110. Speech Physiology. 3 Credits.**

(same as Communication Science and Disorders Program [C\_S\_D] 8110). Analysis of physiological features associated with speech subsystems; theories of encoding with special emphasis on speech motor control mechanisms.

**LINGST 8120. Bilingualism and Language Contact. 3 Credits.**

(same as Spanish [SPAN] 8120 and [FRENCH] French 8120). Global analysis of the study of Bilingualism from a combined sociocultural, sociolinguistic and psycholinguistic perspective based on current research and examination of various phenomena of language contact (taught in Eng.). Prerequisite: graduate standing.

**LINGST 8487. Seminar in Anthropological Linguistics. 3 Credits.**

(same as Anthropology [ANTRHO] 8487). Topics: Ethnolinguistics, linguistic prehistory, pidgin and Creole languages, linguistic theories and cultural and cultural analysis. French structural anthropology. May be repeated for 9 hours maximum.

**LINGST 8600. Seminar in the English Language. 3 Credits.**

(same as English [ENGLHS] 8600). Descriptive and historical studies of the English language. Topics (e.g., The Germanic Origins, Modern

Syntactic Analysis) announced at time of registration. May repeat to twelve hours with department's approval.

**LINGST 8615. History of the German Language. 3 Credits.**  
(same as German [GERMAN] 8615).

**LINGST 8625. Middle High German. 3 Credits.**  
(same as German [GERMAN] 8625). Prerequisites: graduate standing or instructor's consent.

## Management (MANGMT)

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**MANGMT 1010. Contemporary Business Practices. 1 Credit.**  
Course coverage includes an overview of the accountancy, finance, management and marketing majors and careers in each of these fields as well as the integrated nature of business. Graded on A/F basis only.

**MANGMT 1050. Contemporary Leadership Issues in Business. 3 Credits.**  
Course focuses on contemporary business leadership practices and includes an overview of the accountancy, finance, management and marketing majors and careers in each of these fields. Prerequisite: instructor's consent.

**MANGMT 3000. Principles of Management. 3 Credits.**  
Introduction to the basic concepts of management and organization; their application to operations and personnel management. Prerequisite: Completion of 45 semester hours.

**MANGMT 3000H. Principles of Management - Honors. 3 Credits.**  
Introduction to the basic concepts of management and organization; their application to operations and personnel management. Prerequisite: Completion of 45 semester hours. Honors eligibility required.

**MANGMT 3100. Job Search Strategies. 1 Credit.**  
Provides relevant information and skills to help students interested in careers in business conduct an effective job search. Topics covered include self-assessment, company research, preparing a resume, interview skills, networking skills, and negotiation skills.

**MANGMT 3200. Business and Society. 3 Credits.**  
This course emphasizes the ethical implications of managerial decisions and the relationships between businesses and stakeholder groups. Major topics include corporate governance, social responsibility, rights and obligations, and international business. Prerequisite: Admission to upper level business program.

**MANGMT 3300. Introduction to Business Processes and Technologies. 3 Credits.**  
Introduces students to cross-functional business processes including both transactional and decision making forms. Current and emerging technologies used to facilitate efficient and effective action in these processes are explored. Prerequisite: Accountancy [ACCTCY] 2258.

**MANGMT 3540. Introduction to Business Law. 3 Credits.**  
The legal aspects of business related to society--introduction to the legal system; constitutional, criminal, tort law; contracts and sales law cases and problems; administrative regulation of business and consumer issues. Prerequisite: completion of 30 semester hours.

**MANGMT 3901. Special Topics in Management. 1-3 Credit.**  
Study of a selected topic in management taken as part of an organized short-term study abroad program. Prerequisites: instructor's consent.

Some sections of this course may be graded on either on A/F or S/U basis only.

**MANGMT 3975. Current Issues in International Management. 1-3 Credit.**  
Study of current issues and practices in international management taken as part of an organized short term study abroad program. Prerequisite: instructor's consent. Graded on S/U basis only.

**MANGMT 4010. Operations Management. 3 Credits.**  
Managerial analysis of operating problems, with emphasis on planning and control systems. Prerequisites: Management [MANGMT] 3000. Math Reasoning Proficiency Course.

**MANGMT 4020. Human Resource Management. 3 Credits.**  
Introduction to strategies and best practices in attracting, retaining, developing, and compensating employees. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4030. Organizational Behavior. 3 Credits.**  
Examines theoretical constructs and research findings on human behavior in work organizations such as businesses, especially individual differences, dyadic relations and small group behavior. Prerequisites: Management [MANGMT] 3000.

**MANGMT 4050. Management of Service Operations. 3 Credits.**  
Managing services, especially the operation's activity in service firms. Includes determining the service package, forecasting service demand, managing demand, capacity analysis and management, scheduling, cost control, service quality, and human resource management. Standardization, franchising, and service automation addressed. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4060. Project Management Fundamentals. 3 Credits.**  
Practical methods and techniques for managing projects with selective attention to human resource issues. Includes project breakdown analysis, task network scheduling, resource allocation, and assessment/evaluation of project performance. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4110. Total Quality Management. 3 Credits.**  
Introductory, comprehensive approach to quality planning, analysis, and control. Applications orientation. Integrates customer needs, product and service design and delivery, and continuous improvement into all organizational activities. Examines full range of behavioral, technical, and organizational aspects relating to quality. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4120. Human Resource Management Law. 3 Credits.**  
Analysis and evaluation of legal and administrative regulations of terms of employment; Fair Labor Standards, discriminatory practices, safety and health regulations, other regulations. Prerequisites: Management [MANGMT] 4020.

**MANGMT 4130. Advanced Organizational Behavior. 3 Credits.**  
Based upon behavioral science concepts and research findings directed toward understanding and explaining human behavior within organizations. Case studies, individual or team projects. Prerequisites: Management [MANGMT] 4030.

**MANGMT 4140. Business Communication. 3 Credits.**  
The course provides the fundamentals of business communication skills, including written, oral communication, listening, multicultural communication, and teamwork skills, with an emphasis on written communication skills as a methods to communicate with important stockholders. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4185. Problems in Management. 1-99 Credit.**

Undergraduate students may select topics for study and investigation. Selected sections of this course may be graded either on A/F or S/U basis only. Prerequisite: instructor's consent.

**MANGMT 4201. Topics in Management. 3 Credits.**

Selected current topics in management. Offered on an experimental, one-semester basis only. Prerequisite: will vary with different topics.

**MANGMT 4201H. Topics in Management. 3 Credits.**

Selected current topics in management. Offered on an experimental, one-semester basis only. Prerequisite: will vary with different topics. Honors eligibility required.

**MANGMT 4210. Management Science. 3 Credits.**

Further development of models and quantitative analysis as applied to production management problems. Management research design and experimentation; computer applications; quantitative case analyses; individual industrial field studies. Corequisite: Statistics [STAT] 3500 and Accountancy [ACCTCY] 2258 or Computer Science [CMP\_SC] 1050, junior standing. Math Reasoning Proficiency Course.

**MANGMT 4220. Compensation Theory and Practice. 3 Credits.**

Examines the empirical research and theory relating to the effect of compensation administration systems upon employee satisfaction and performance. Analysis of financial compensation systems and benefit programs in use in modern organizations. Prerequisite: Management [MANGMT] 4020.

**MANGMT 4310. Modern Manufacturing. 3 Credits.**

Contemporary qualitative and quantitative analysis of automation systems for production and inventory; robotics, digital data matrix and Q/R coding, PLC overview; uncertainty, risk, and policy considerations; analysis of networks; management problems in application. Pre/Co-requisite: Management [MANGMT] 4010.

**MANGMT 4320. Selected Problems in Human Resource Management. 3 Credits.**

Advanced studies in selected administrative and technical policies, practices in employee relations, with individual and group project work, research. Focuses on policy issues, research findings, advanced techniques. Prerequisites: Management [MANGMT] 4020.

**MANGMT 4330. Organizational Theory. 3 Credits.**

Elements of the managerial process; emphasis on theory of organization structure and design and the impact of technology and culture on organization systems. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4330H. Organizational Theory - Honors. 3 Credits.**

Elements of the managerial process; emphasis on theory of organization structure and design and the impact of technology and culture on organization systems. Prerequisite: Management [MANGMT] 3000. Honors eligibility required.

**MANGMT 4340. Crisis Management. 3 Credits.**

Management strategies for media relations, image and identify building, internal communication, government relations, and crisis communication are explored through case studies, film, literature, and current popular culture. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4350. Leadership Development. 3 Credits.**

Provides a comprehensive understanding of leadership development within the corporate environment. Examines causes and outcomes of different styles of leadership that are designed to fit the needs of individuals and/or specific situations. Prerequisite: Management 3000 [MANGMT] 3000.

**MANGMT 4420. Collective Bargaining. 3 Credits.**

Content, negotiation, administration of collective labor agreements and settlement of disputes. Prerequisites: Management [MANGMT] 3000.

**MANGMT 4450. Management of Electronic Commerce. 3 Credits.**

An introduction to electronic commerce. Topics covered include definition and scope of e-commerce, tools and technologies used, strategies, and understanding of this dynamic field. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4460. Electronic Commerce Security. 3 Credits.**

Comprehensive introduction to the concepts, technologies, and applications of security in electronic commerce. Topics include security policy, privacy, cryptography, types of attacks, protection, detection and response strategies. Prerequisites: Management [MANGMT] 3000 and Accountancy [ACCTCY] 2258.

**MANGMT 4480. Business Data Communication and Networking. 3 Credits.**

Introduction to fundamental principles of technical and managerial aspects of business data communications and networks. Basic concepts and principles, protocol layers, content distribution, routing, LAN, wireless, security, network management, multimedia networking, and new developments. Prerequisite: Management [MANGMT] 3000 and Accountancy [ACCTCY] 2258.

**MANGMT 4520. Change Management in Business. 3 Credits.**

Provides a comprehensive understanding of the processes of change in the corporate environment. Examines antecedents of change such as acquisitions, mergers, technology and new leadership as well as approaches to managing change using tools from organization development (OD). Prerequisite: Management [MANGMT] 3000.

**MANGMT 4540. Legal Aspects of Business Organization and Operation. 3 Credits.**

Includes agency and employment relationships, sole proprietorships, partnerships, and corporations, also operational aspects of business associations such as administrative regulation, taxation, bankruptcy, and trade regulation. Prerequisite: Management [MANGMT] 3540.

**MANGMT 4560. The Law of Commercial Credit Transactions. 3 Credits.**

Purchase and sale of goods, services and real property-discussion includes drafts, notes, security agreements under the Uniform Commercial Code, and credit financing of real estate. Prerequisite: Management [MANGMT] 3540.

**MANGMT 4620. Web Development Fundamentals. 3 Credits.**

An introduction to the fundamentals of design, technology and project management aspects of developing websites. Some web based programming languages including HTML, CSS, JavaScript and ASP/VBScript and an introduction to Adobe Photoshop and Macromedia Dreamweaver. Prerequisite: Management [MANGMT] 3000 and Accountancy [ACCTCY] 2258.

**MANGMT 4700. Principles of Entrepreneurship. 3 Credits.**

An introductory course designed to provide a solid foundation of the role of entrepreneurship. The focus is on the creation of new ventures, the decisions leading to their development, and the factors that lead to their success. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4710. The Entrepreneurial Process. 3 Credits.**

This course deals with critical thinking, logic, emotional intelligence, ethics and a problem solving/decision making frame in the context of the entrepreneurial business phases: opportunity identification; launch

after gathering resources; managing growth and harvesting rewards.  
Prerequisite: Management [MANGMT] 3000.

**MANGMT 4730. New Business Planning and Management. 3 Credits.**

Analysis of the major functional areas of the start-up firm including accounting, finance, human resources, information systems, logistics, management, marketing, production/operations, purchasing and sales. Focus is also placed on generating ideas, scanning for environmental trends, and critically evaluating opportunities. Prerequisite: Management [MANGMT] 3000.

**MANGMT 4750. Entrepreneurial Innovation Management: Enterprise Conception. 3 Credits.**

(same as Industrial Manufacturing Systems Engineering [IMSE] 4750). Develop a new business and technology plan including marketing, finance, engineering, manufacturing, and production concepts in this joint College of Engineering and College of Business course. Prerequisite: sophomore standing or instructor's consent.

**MANGMT 4760. Entrepreneurial Innovation Management: Enterprise Design. 3 Credits.**

(same as Industrial Manufacturing Systems Engineering [IMSE] 4760). Expand on Management [MANGMT] 4750 business/technology plan into an operations plan; advertising facilities layout, selling and distribution channels, product designs, accounting procedures, manufacturing processes, and prototypes. Prerequisite: MANGMT 4750; sophomore standing or instructor's consent.

**MANGMT 4765H. Entrepreneurial Innovation Management: Enterprise. 3 Credits.**

(same as Industrial Manufacturing Systems Engineering [IMSE] 4765H). Expand on Management [MANGMT] 4750 business/technology plan into an operations plan; advertising facilities layout, selling and distribution channels, product designs, accounting procedures, manufacturing processes, and prototypes. Prerequisite: Management [MANGMT] 4750; sophomore standing or instructor's consent. Honors eligibility required.

**MANGMT 4770. Entrepreneurial Innovation Management: Enterprise Operation. 3 Credits.**

(same as Industrial Manufacturing Systems Engineering [IMSE] 4770). Perform the day-to-day operations for an enterprise by managing all business processes including finance, manufacturing, sales and delivery. Prerequisite: Junior Standing.

**MANGMT 4940. Professional Management Internship. 3 Credits.**

Provides experience with management activities in business organizations (or, occasionally, in a governmental or not-for-profit setting). Students are required to prepare and execute a plan of study approved by the instructor and to complete written assignments detailed in the plan. Course only satisfies a professional elective requirement of the program. Prerequisite: COB student with a management concentration, and Internship Coordinator's consent. Graded on S/U basis only.

**MANGMT 4970. Strategic Management. 3 Credits.**

Enterprise-level case studies, simulations, similar exercises to integrate business functional decisions; assessment of environmental influences on business. Development, implementation of company strategies. Prerequisites: Management [MANGMT] 3000, Marketing [MRKTNG] 3000, Finance [FINANC] 3000 and 100 credit hours earned. Open only to seniors admitted to a professional program in the CoB.

**MANGMT 7010. Operations Management. 3 Credits.**

Managerial analysis of operating problems, with emphasis on planning and control systems. Prerequisites: graduate standing and Management [MANGMT] 3000.

**MANGMT 7020. Human Resource Management. 3 Credits.**

Introduction to strategies and best practices in attracting, selecting, retaining developing, and compensating employees. Prerequisites: graduate standing and Management [MANGMT] 3000.

**MANGMT 7030. Organizational Behavior. 3 Credits.**

Examines theoretical constructs and research findings on human behavior in work organizations such as businesses, especially individual differences, dyadic relations and small group behavior. Prerequisites: graduate standing and Management [MANGMT] 3000.

**MANGMT 7201. Topics in Management. 3 Credits.**

Selected current topics in management. Offered on an experimental, one-semester basis only. Prerequisite: graduate standing.

**MANGMT 7330. Organizational Theory. 3 Credits.**

Elements of the managerial process; emphasis on theory of organization structure and design and the impact of technology and culture on organization systems. Prerequisite: graduate standing and Management [MANGMT] 3000.

**MANGMT 7380. Organizational Behavior and Management: The Individual. 1.5 Credit.**

An examination of factors influencing behavior in organizations. An analysis of research, theory, and current practices dealing with managing people in work organizations. Focus on the individual within the organizational context. Prerequisite: graduate standing.

**MANGMT 7390. Organizational Behavior and Management: Dyadic, Group and Organizational Processes. 1.5 Credit.**

An examination of factors influencing behavior in organizations. Analysis of research, theory, and current practices dealing with managing people in work organizations. Focus on dyadic, group and system-wide processes. Prerequisites: graduate standing; Management [MANGMT] 7380.

**MANGMT 7400. Managerial Analytics. 1.5 Credit.**

Spreadsheet modeling procedures to address common business problems. Analysis of real-world cases and unstructured problems using basic and advanced features software and communication of results in managerial format. Prerequisites: Familiarity with spreadsheet software. Open to Crosby MBA students ONLY. Graded A/F only.

**MANGMT 7410. Management Information Systems. 1.5 Credit.**

A managerially-oriented, case-based introduction to information systems. Emphasizes how information systems technology can aid managers in improving organizational performance, group work, and personal productivity, thus providing competitive advantage. Prerequisite: graduate standing.

**MANGMT 7420. Managerial Statistics. 1.5 Credit.**

Overview of statistics as an aid in decision making. Emphasis on summarizing data, statistical inference, sampling techniques, and regression based forecasting as applied to problems in business.

**MANGMT 7430. Operations and Supply Chain Management. 3 Credits.**

Surveys problems common to operations within a complex organization. Emphasizes planning, control, and decision making.



**MANGMT 7470. Data Analysis for Managers. 1.5 Credit.**

Statistical thinking approaches to address common business data and problems. Analysis of real-world cases and unstructured data using statistical features of spreadsheet software and communication of results in managerial format. Prerequisite: Management [MANGMT] 7400 and 7420. Open to Crosby MBA students ONLY. Graded A/F only.

**MANGMT 7540. Legal Aspects of Business Organization and Operation. 3 Credits.**

Includes agency and employment relationships, sole proprietorships, partnerships, and corporations, also operational aspects of business associations such as administrative regulation, taxation, bankruptcy, and trade regulation. Prerequisite: graduate standing and Management [MANGMT] 3540. Restricted to COB students.

**MANGMT 8001. Topics in Management. 1-6 Credit.**

Selected current topics in management. Prerequisite: graduate standing.

**MANGMT 8054. Entrepreneurship and Media of the Future. 3 Credits.**

(same as JOURN 8054). This course will give students an intense hands-on experience in working with real entrepreneurs on complex business problems in the journalism field. Example companies are the Associated Press, Kachingle, the Chicago Sun-Times, Spot-Us and the Media Policy Center. The goal is to offer a solution or solutions to the stated problem, and to present these ideas in a competitive, symposium environment. Graded on A-F basis only. Prerequisite: graduate standing in Journalism or MBA program.

**MANGMT 8085. Problems in Management. 1-99 Credit.**

Graduate students may select topics for study and investigation. Selected sections of the course may be offered either on A/F or S/U basis only.

**MANGMT 8100. Exploring the Digital Globe. 3 Credits.**

Impacts of technological change and globalization are explored from the perspective of business, law and journalism. The first course required for the "CDiG certificate". Issues involving electronic commerce, digitization and globalization will be analyzed through online and in-class projects, class discussion and guest lectures. Prerequisite: enrollment in CDiG Graduate Certificate Program or instructor's consent.

**MANGMT 8300. Business and Society. 3 Credits.**

Interdependence of the business firm and its social, political, and legal environment; interrelationships with governments, interest groups, and the larger society; role of business in formulation of community, regional, national, and foreign policy.

**MANGMT 8310. Strategic Human Resource Management. 3 Credits.**

Analysis of research and practice in planning for attracting, selecting, developing, and disciplining of employees at work. Prerequisites: graduate standing.

**MANGMT 8320. Management of Labor Relations. 3 Credits.**

Managerial approaches to collective bargaining. Negotiation, grievances, agreement administration; emphasis on recent developments. Prerequisite: graduate standing.

**MANGMT 8330. Current Issues in Human Resource Management. 3 Credits.**

Exploration of current trends, issues, and controversies involving the managing of human resources in organizations, with an emphasis on how human resources can provide competitive advantage. Considers multiple perspectives, including that of employers, employees, and other stakeholders. Prerequisite: Management [MANGMT] 8310 or 7380 and 7390.

**MANGMT 8335. Human Resource Law. 3 Credits.**

The study of best HR practices from a legal point of view, including avoiding employer liability related to recruiting, interviewing, hiring, classifying, supervising and terminating employees. Prerequisites: graduate standing.

**MANGMT 8340. Organizational Design. 1.5 Credit.**

Principles of effective organizational design contingent upon contextual factors such as an organization's size, technology, and environment; dimensions of organizational structure; overall forms of organizational design. Graduate standing required.

**MANGMT 8345. Organizational Culture. 1.5 Credit.**

Concept of culture in an organizational context; models of organizational culture; culture's relationships with individual behavior, organizational effectiveness, and organizational change, especially change related to strategy implementation and to mergers and acquisitions. Graduate standing required.

**MANGMT 8350. Organizational Analysis and Change in the Public Sector. 3 Credits.**

Investigates the social and psychological dynamics of organizational diagnosis, feedback and learning, intervention, planned change. Students study organizational life from the viewpoint of experienced organizational analysts and consultants. The predominant theoretical approach offered in this course is clinical and psychodynamic.

**MANGMT 8360. Negotiations. 3 Credits.**

A structured overview of negotiations; includes the development of improved negotiation skills. Topics include power, distributive negotiations, integrative negotiations, maneuvers, tactics, strategies, conflict, complex negotiations, mediation, and negotiation ethics. Prerequisite: graduate standing.

**MANGMT 8370. Managerial Leadership. 3 Credits.**

An examination of the historical conceptions, definitions, theories, and research findings in the managerial leadership literature. The application of this literature to the development of analytical and leadership skills. Prerequisites: graduate standing, Management [MANGMT] 7380 and 7390.

**MANGMT 8400. Management Science Modeling. 1.5 Credit.**

Application of management science modeling procedures to organizational decision making. Topics include mathematical programming, queuing, and network models. Stresses managerial point of view with analysis of problems and interpretation of computer solutions. Prerequisites: Management [MANGMT] 7420.

**MANGMT 8410. Decision Making and Risk. 1.5 Credit.**

Managerial approaches to decision making under risk and uncertainty with emphasis on decision analysis, spreadsheet simulation, and computer solutions via other management science models. Discussion of rational and behavioral decision making and procedures for assessing risk and uncertainty. Prerequisite: Management [MANGMT] 7400 or equivalent.

**MANGMT 8420. Decision Support Systems. 3 Credits.**

The theory, methodology and implementation of Decision Support Systems (DSS). Topics include the DSS concept, applications, organizational issues, hardware and software technology, developmental methodology, data-model-user relationships, user interfaces, implementation strategies, and evaluation procedures. Includes hands-on building of a DSS. Prerequisite: graduate standing.

**MANGMT 8430. Database Management. 3 Credits.**

Data management, including database development, access, and administration. A focus on key issues and principles of managing organizational data, such as developing data models, creating relational databases, and formulating and executing queries. Prerequisite: completion of or concurrent enrollment in Management [MANGMT] 7410.

**MANGMT 8440. Topics in Electronic Commerce. 3 Credits.**

Fundamental principles of the technical and managerial aspects of business telecommunications. Basic concepts of telecommunication technology, TCP/IP architecture, LAN, WAN ZoS, client/server, security, wireless, issues related to the operational and strategic use of the technology, networked applications, and new developments in the area. Prerequisites: Management [MANGMT] 7410 and one other MIS course; graduate standing; departmental consent.

**MANGMT 8450. Information Resource Management. 3 Credits.**

Management issues and techniques involving information system/resource activities, with a focus on computer-based resources and IS development activities. Includes management of IS professionals and project teams, user relationships, emerging technologies, and planning processes. Prerequisite: completion of one required E-Commerce (Management [MANGMT] 8440, 8430) or IT (Management [MANGMT] 8460, 8001: Web Programming) MBA concentration course.

**MANGMT 8460. Systems Approach to Business Application Development. 3 Credits.**

Design and implementation of transaction-based business applications systems, utilizing structured analysis and design concepts. Course will emphasize database development and implementation and computer programming. Prerequisite: completion of or concurrent enrollment in Management [MANGMT] 7410.

**MANGMT 8470. Business Telecommunications. 3 Credits.**

Fundamental principles of the technical and managerial aspects of business telecommunication. Basic concepts of telecommunication technology, TCP/IP architecture, LAN, WAN, QoS, client/server, security, wireless, issues related to the operational and strategic use of the technology, networked applications, and new developments in the area. Prerequisites: Management [MANGMT] 7410 and one other MIS course; graduate standing; departmental consent.

**MANGMT 8480. Web Development. 3 Credits.**

An advanced introduction to the fundamentals of design, technology and project management aspects of developing websites. Several programming languages including HTML, CSS, JavaScript, CGI/Perl, PHP and ASP/VBScript and an introduction to Adobe Photoshop and Macromedia Dreamweaver. Requires Visual Basic knowledge. Prerequisites: graduate standing and Visual Basic knowledge; departmental consent.

**MANGMT 8510. Project Management. 1-3 Credit.**

An advanced introduction to methods and techniques for managing projects, with selective attention to human resource issues as required. Includes project breakdown analysis, task network scheduling, resource allocation, and assessment/evaluation of project performance. Prerequisite: graduate standing; departmental consent.

**MANGMT 8540. Entrepreneurial Ventures. 3 Credits.**

Analysis of management challenges facing entrepreneurial startups and alternative strategic responses to those challenges. Views issues from multiple functional perspectives to design cross-functional solutions to entrepreneurial problems. Prerequisites: graduate standing.

**MANGMT 8550. Launching a High-Growth Venture. 3 Credits.**

An experiential learning course using a business plan competition to simulate planning and securing capital for high-growth ventures. Participants with management, marketing or finance interests learn skills for preparing and presenting business plans to investors. Prerequisites: graduate standing.

**MANGMT 8560. Legal Strategies for Entrepreneurs. 3 Credits.**

The study of how legal decisions affect a business organization of various transitional states of development, from start up to going public. Designed for both MBA and Law students, who work together planning legal transitions of a business. Prerequisites: graduate standing.

**MANGMT 8970. Business Environment and Strategy. 3 Credits.**

Investigates alternative goals of business enterprises relative to internal resources and external environment; development and implementation of policies and strategies to achieve objectives. Cases, computer simulations, and/or field research may supplement published materials.

**MANGMT 9010. Research Methods in the Organization Sciences. 3 Credits.**

Identifying research questions, critiquing research ideas, planning, conducting, and communicating research using experimental, cross-sectional, survey and qualitative methods. Prerequisite: PhD student or instructor's consent.

**MANGMT 9020. Seminar in Micro Organizational Behavior. 3 Credits.**

Examination of theory and research on individuals within an organizational context, including individual perceptions, personality, attitudes, motivation, affect and behavior, and influences on outcomes such as job satisfaction and performance. Prerequisites: PhD students and instructor's consent.

**MANGMT 9030. Seminar in Macro Organizational Behavior. 3 Credits.**

This course is designated to introduce students to content areas within the organizational behavior literature. Topics in "macro" organizational behavior will be covered, including groups and teams, organizational culture, and national culture. We will also cover a number of topics outside of traditional organizational behavior topics, including negotiation and social conflict, creativity, empowerment, and other topics as the instructor sees fit. Readings will consist of a combination of recent and classic journal articles on the topics. Prerequisites: PhD Students and instructor's consent.

**MANGMT 9040. Seminar in Human Resource Management. 3 Credits.**

Intensive study of current research, issues and methodology of the applied science of human resource management. Topics include recruitment and selection, training, job performance and performance feedback, and career success. Prerequisites: PhD student or instructor's consent.

**MANGMT 9050. Seminar in Organization Theory. 3 Credits.**

Focuses on the organization as the subject of analysis with coverage of the effectiveness structure, environment, culture, and development of organizations. Prerequisites: PhD student or instructor's consent.

**MANGMT 9060. Seminar in Corporate Strategy. 3 Credits.**

The doctoral seminar in strategy focuses on the topics of strategy content research (what strategies are used by firms, and what is their effect on performance, corporate and competitive strategy, etc.) but also considering important related research streams of strategy process and implementation. Prerequisites: PhD student or instructor's consent.

**MANGMT 9080. Seminar in Entrepreneurship. 3 Credits.**

The doctoral seminar in Entrepreneurship is intended to provide students with a broad coverage of the literature. It focuses on the foundations and "cutting edge" research in entrepreneurship content research. Topics covered in the course include: a theoretical overview of entrepreneurship, identification of opportunities, the decision to exploit opportunities, resource assembly and new markets, founders and entrepreneurial teams, venture capital and venture capitalists, entrepreneurship and efficient governance, initial public offerings (IPOs), new ventures (strategy, growth, performance), entrepreneurial networks and alliances, and international entrepreneurship. Prerequisites: PhD student or instructor's consent.

**MANGMT 9087. Seminar in Management. 1-99 Credit.**

Intensive studies of current research and issues. Readings, independent investigations, reports. Prerequisites: open to Ph.D. students, or instructor's consent.

**MANGMT 9090. Research in Management. 1-99 Credit.**

Thesis research for Ph.D. degree. Graded on a S/U basis only.

**MANGMT 9101. Topics Seminar in Management. 1-3 Credit.**

Reading and critical evaluation of selected current management literature and research. Prerequisites: Ph.D. students only. May be repeated.

## Marketing (MRKTNG)

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**MRKTNG 3000. Principles of Marketing. 3 Credits.**

Institutions, processes, and problems involved in producing and transferring goods and services from producer to consumers; emphasis on economics and social aspects. Prerequisites: 45 semester hours; Economics [ECONOM] 1014, 1024 or 1051.

**MRKTNG 3000H. Principles of Marketing - Honors. 3 Credits.**

Institutions, processes, and problems involved in producing and transferring goods and services from producer to consumers; emphasis on economics and social aspects. Prerequisites: 45 semester hours; Economics [ECONOM] 1014, 1024 or 1051. Honors eligibility required.

**MRKTNG 3901. Special Topics in Marketing. 1-3 Credit.**

Study of a selected topic in Marketing in a course taken for credit as part of an organized study abroad program. May be repeated for credit. Graded on S/U basis only.

**MRKTNG 3942. International Business Internship. 1-3 Credit.**

Internship in an international setting; Marketing Independent Study Coordinator must approve internship plan. Student and mentor reports required. See Marketing website for request form, internship requirements and details. Prerequisite: departmental consent; Marketing [MRKTNG] 3000. Graded on S/U basis only.

**MRKTNG 3975. Current Issues in International Marketing. 1-3 Credit.**

Study of current issues and practices in international marketing in a course taken for credit as part of an organized study abroad program. May be repeated for credit. Graded on S/U basis only.

**MRKTNG 3985. Problems in International Business. 3 Credits.**

Independent study associated with a course taken for credit as part of an organized study abroad program. See Marketing website for request form. Prerequisite: departmental consent; Marketing [MRKTNG] 3000. Graded on S/U basis only.

**MRKTNG 4000. Marketing Management. 3 Credits.**

Further examination of marketing issues: market analysis, market research, positioning, products, pricing, promotion, distribution, relationship management, other topics. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4000H. Marketing Management - Honors. 3 Credits.**

Further examination of marketing issues: market analysis, market research, positioning, products, pricing, promotion, distribution, relationship management, other topics. Prerequisites: Marketing [MRKTNG] 3000 and junior standing. Honors eligibility required.

**MRKTNG 4050. Marketing Research. 3 Credits.**

Procedures for defining marketing research problems; specifying information requirements; collecting, analyzing, interpreting, and presenting data for use in marketing decision making. Utilizes student projects and research-related computer assignments. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000, Statistics [STAT] 3500 and junior standing.

**MRKTNG 4185. Problems in Marketing. 1-3 Credit.**

In-depth independent study of marketing topic(s). Student must have course plan (assignments, evaluation criteria, etc.) approved by faculty sponsor. Contact Marketing Department office for details and enrollment permission. Selected sections of this course may be graded either on A/F or S/U basis only. Prerequisite: departmental consent, Marketing [MRKTNG] 3000, and junior standing.

**MRKTNG 4201. Topics in Marketing. 3 Credits.**

Selected marketing-related topics. Subjects may vary across semesters. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4220. Consumer Behavior. 3 Credits.**

Dimensions of the consumer market and decision-making process of consumers; analyzing economic, psychological and socio-psychological influences on consumer market and buying behavior. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4220H. Consumer Behavior - Honors. 3 Credits.**

Dimensions of the consumer market and decision-making process of consumers; analyzing economic, psychological and socio-psychological influences on consumer market and buying behavior. Prerequisites: Marketing [MRKTNG] 3000 and junior standing. Honors eligibility required.

**MRKTNG 4250. Retail Marketing. 3 Credits.**

Strategies, policies, tactics, and procedures of marketing in a retailing environment. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisite: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4250H. Retail Marketing - Honors. 3 Credits.**

Strategies, policies, tactics, and procedures of marketing in a retailing environment. Prerequisite: Marketing [MRKTNG] 3000 and junior standing. Honors eligibility required.

**MRKTNG 4350. Business-to-Business Relationships. 3 Credits.**

Strategies, tactics, and challenges involved in developing, organizing, and managing interfirm relationships in business/ industrial markets. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisite: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4380. Buying and Supply Chain Management. 3 Credits.**

Strategies, tactics, challenges, and issues involved in buying, industrial purchasing, and supply chain management. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4410. Personal Selling. 3 Credits.**

Modern selling methods that focus on solving customer problems rather than using manipulative techniques. Principles underlying the sale process. Practical methods for building long-term customer relationships in business-to-business contexts are emphasized. Graded on A/F basis only. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with an emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4420. Sales Management. 3 Credits.**

Methods and tools employed by salespeople and field sales managers; emphasis on underlying behavioral and quantitative theory. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with an emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4440. Services Marketing. 3 Credits.**

Challenges, problems, and strategies specific to marketing in service industries. Topics include the unique characteristics of services and managing service-oriented businesses; service design and service recovery; service quality and customer satisfaction service pricing issues and demand management; and management of service customers and employees. Graded on A/F basis only. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with an emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4450. Marketing Channels. 3 Credits.**

Development and management of the interorganizational or internal networks through which goods and services are provided to consumer and business markets. Particular emphasis on the relationship between channel activities and the implementation of market strategy. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisite: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4501. Topics in Marketing Strategies. 1-3 Credit.**

Selected topics related to marketing strategy. Subjects may vary across semesters. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing,

or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000, junior standing.

**MRKTNG 4550. Integrated Marketing Communications. 3 Credits.**

Design, coordination, and management of marketing communications. Focus on the role of integrated marketing communications in the overall marketing process, with emphasis on advertising and sales promotion strategies and tactics. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisite: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4650. e-Marketing. 3 Credits.**

Strategic and managerial challenges and issues related to use of the Internet and other electronic channels as marketing tools. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisite: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4720. Global Marketing. 3 Credits.**

Strategic and managerial issues associated with international trade and international marketing. During early registration, some section may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4720H. Global Marketing - Honors. 3 Credits.**

Strategic and managerial issues associated with international trade and international marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing. Honors eligibility required.

**MRKTNG 4750. Marketing, Society, and Government. 3 Credits.**

Interface between marketing, society, and government; emphasis on potential conflicts and issues such as competition, externalities, and regulation. During early registration, some sections may be restricted to College of Business students with an emphasis in Marketing, or International Business with emphasis in Marketing. Prerequisite: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4880. Contemporary Issues in Marketing. 3 Credits.**

Selected topical issues, their impact on marketing and marketers, and implications for firms and industries. Emphasis on scanning the external environment, projection of trends, and analysis; strategy development based on environmental analysis. During early registration, some sections may be restricted to College of Business students with emphasis in Marketing, or International Business with emphasis on marketing. Prerequisites: Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 4880H. Contemporary Issues in Marketing - Honors. 3 Credits.**

Selected topical issues, their impact on marketing and marketers, and implications for firms and industries. Emphasis on scanning the external environment, projection of trends, and analysis; strategy development based on environmental analysis. Prerequisites: Marketing [MRKTNG] 3000 and junior standing. Honors eligibility required.

**MRKTNG 4940. Marketing Practicum. 3 Credits.**

Course providing experience within ongoing business. Study plan, meeting, and written assignments required. See Marketing website for application, qualifications, requirements and details. Graded on S/U basis only. Prerequisites: instructor's consent; Marketing and international business-marketing majors only; Marketing [MRKTNG] 3000 and junior standing.

**MRKTNG 7201. Topics in Marketing. 1-99 Credit.**

The study of selected topics in Marketing. Subjects may vary from semester to semester. Prerequisites: Marketing [MRKTNG] 3000 and graduate standing or instructor's consent; departmental consent for repetition.

**MRKTNG 7460. Managerial Marketing. 1-3 Credit.**

Introduces concepts and theories for marketing decision making. Provides an overview of principles and tools to analyze and understand marketing situations in order to develop and execute appropriate marketing initiatives. MBA Program consent required.

**MRKTNG 7470. Advanced Marketing Management. 1-3 Credit.**

Develops knowledge and skills to manage marketing activities at the strategic and tactical levels. Course utilizes case studies, interactive class exercises, and advanced marketing readings. Students will learn to apply relevant concepts for effective marketing strategy development, marketing planning, and implementation of marketing mix decisions. Prerequisite: MBA program consent required; Marketing [MRKTNG] 7460.

**MRKTNG 8001. MBA Topics in Marketing. 1-3 Credit.**

Advanced study of selected marketing-related topics. Subjects vary across semesters. Prerequisites: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8050. Marketing Strategy. 1-3 Credit.**

Builds on the foundations of Marketing [MRKTNG] 7460. This course focuses on how a firm can formulate a market-driven business strategy in a competitive environment and the planning and implementation of marketing programs based on this strategy. Prerequisites: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8060. Competitive Marketing Strategy. 1-3 Credit.**

Builds on the foundations of Marketing [MRKTNG] 7460 and 7470. Focuses on quantitative market intelligence-based design, execution, and adaptation of a market-drive business strategy to improve a firm's financial performance over time in a competitive environment. Uses a competitive, multi-period, marketing simulation game in which students are assigned to manage one of several firms competing in an industry. Prerequisite: MBA Program consent required; Marketing [MRKTNG] 7460 and 7470. Cannot receive credit for both Marketing [MRKTNG] 8050 and 8060.

**MRKTNG 8070. Marketing Business Models. 1-3 Credit.**

Builds on the foundations of Marketing [MRKTNG] 7460 and 7470. Focuses on the formulation and analysis of marketing strategy and contemporary business models for creating and capturing value in different industries such as consumer goods, services, retailing, media, sports, entertainment, and online businesses. Business revenue and profit models will be evaluated in conjunction with marketing performance. Prerequisite: MBA Program consent required, Marketing [MRKTNG] 7460 and 7470. Cannot receive credit for both Marketing [MRKTNG] 8050 and 8070.

**MRKTNG 8085. MBA Independent Study in Marketing. 1-3 Credit.**

Advanced independent study of marketing topics(s). Student must have a course plan (assignments, evaluation criteria, etc.) approved by a marketing faculty member. Prerequisites: departmental and MBA Program consent required; Marketing [MRKTNG] 7460, 7470. Graded on S/U basis only.

**MRKTNG 8220. Customer Analysis. 1-3 Credit.**

Concepts and approaches for understanding customer needs and wants. Emphasis is on analyzing and predicting customer responses to marketing actions. Prerequisites: MBA program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8280. Research for Marketing Decisions. 1-3 Credit.**

Methods for generating and using information related to marketing decisions. The course is aimed at the manager who designs, conducts, and/or uses the research. Emphasizes the design of research studies to inform managers' decisions and techniques for gathering and analyzing primary and secondary data. Prerequisites: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8350. Business-to-Business Marketing. 1-3 Credit.**

Advanced study of the marketing of goods and services to business customers; customer relationship management, and functionally integrated approaches to solving business problems. Prerequisite: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8420. Sales Force Management. 1-3 Credit.**

Basic tasks of sales management as well as the application of theories and concepts to effectively manage that function. Topics covered include salesperson effectiveness, deployment, motivation, organizational design, compensation and evaluation. Prerequisites: Marketing [MRKTNG] 7460; MBA Program consent required.

**MRKTNG 8480. Relationship Marketing. 1-3 Credit.**

Focuses on the development of relationship marketing strategies and programs. The course examines relevant business models, the concept of customer lifetime value and financial as well as behavioral aspects of managing customer relationships. Database marketing methods and interactive tools for profitably managing customer relationships are also discussed. Prerequisites: Marketing [MRKTNG] 7460; MBA Program consent required.

**MRKTNG 8520. Services Marketing. 1-3 Credit.**

Focuses on service marketing problems and strategies of goods and service organizations. Subjects covered include the nature of services, organizing for service delivery, managing demand, tailoring the customer mix and managing supply. Prerequisites: Marketing [MRKTNG] 7460; MBA Program consent required.

**MRKTNG 8580. Product Management. 1-3 Credit.**

Focus is on new product/service decisions and development processes. Discussion emphasized analytical approaches to new product portfolio decisions and the research needed as input to such decisions. Program strategy, opportunity creation, concept development, product testing, demand estimation, and results evaluation are stressed. Prerequisites: Marketing [MRKTNG] 7460; MBA Program consent required.

**MRKTNG 8620. Marketing Decision Models. 1-3 Credit.**

Quantitative tools and models used to analyze and solve marketing problems. Prerequisites: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8650. Digital Marketing. 1-3 Credit.**

The use of the Internet and other electronic channels as marketing tools. Emphasis on integration of digital interactions and communication into the overall marketing strategy. Prerequisites: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8680. Database Marketing. 1-3 Credit.**

A quantitatively-oriented, hands-on course regarding the use of customer data for making decisions about marketing campaigns and targeting of

individual customers. Concepts and applications in this course emphasize statistical analysis of large datasets involving customer records. The analytical and statistical programming skills learned in the course should be useful in any data-oriented business environment. Graded on A/F basis only. Prerequisites: MBA Program consent required, Marketing [MRKTNG] 7460, 7470, Management [MANGMT] 7400, 7420, and 7470.

**MRKTNG 8720. International Marketing. 1-3 Credit.**

Strategic and managerial issues associated with international trade and international marketing. The course focuses on managerial decision making in the differing and complex environments across foreign markets, alternative methods by which firms enter foreign markets and the development and implementation of international marketing strategies. Prerequisites: MBA Program consent required and Marketing [MRKTNG] 7460.

**MRKTNG 8750. Brand Management. 1-3 Credit.**

Focuses on the creation and execution of profitable brand strategies. Examines the practice of branding, the key components of brand equity, and how firms can build and sustain successful brands in competitive markets. Prerequisite: MBA Program consent required, MRKTNG 7460 and Marketing [MRKTNG] 7470.

**MRKTNG 8760. Marketing Engineering. 1-3 Credit.**

A systematic, analytical approach to marketing decision-making. Students will be able to build their analytical skills through a combination of lectures, Excel-based software tools, and business case studies. Emphasis is on hands-on approaches for solving real-world marketing problems in domains such as segmentation, targeting, positioning, and resource allocation. The course will help students understand the financial impact of marketing expenditures including ROI assessment. Graded on A/F basis only. Prerequisites: MBA Program consent required, Marketing [MRKTNG] 7460, 7470 and Management [MANGMT] 7400.

**MRKTNG 8770. Marketing Databases and SQL. 1-3 Credit.**

A user/analyst perspective to relational databases used in marketing applications. Fundamentals of relational databases, including database concepts, table design, views, normalization, and security. Hands-on training in SQL (Structured Query Language) on database tables and views to retrieve, change, join, filter, sort, group, and summarize data. Data analysis with SQL and Excel combined. Presentation of SQL results sets. Prerequisites: MBA program consent required, Management [MANGMT] 7410. Course graded on A/F basis only. Graduate Standing Required.

**MRKTNG 8780. Advanced Marketing Analytics. 1-3 Credit.**

Analytical methods for solving marketing problems. Emphasis on use of multivariate statistical techniques (e.g. regression models, time series models, principal components analysis, cluster analysis, discriminant analysis, ANOVA, survival/duration models, etc.) to aid marketing tasks and decisions in areas such as customer classification, segmentation, profiling, and targeting; prospecting with archival data; customer response to marketing interventions; customer acquisition/retention tactics; customer relationship management (CRM); sales forecasting; media allocation decisions; market basket analysis; etc. Graded on an A-F basis only. Prerequisites: MBA program consent required, MRKTNG 8680.

**MRKTNG 8880. Markets in Transition. 1-3 Credit.**

Analysis of selected industries with emphasis on marketing activities and environments. Particular emphasis given to forecasting major trends or changes anticipated in markets over the next decade. Prerequisite:

Business Administration [BUS\_AD] 7460 or equivalent; consent of MBS program required.

**MRKTNG 9010. Introduction to Research Methods in Marketing. 1-3 Credit.**

Introduces students to the research process. Examines philosophy of science, constructs and measurement issues regarding validity, and hypothesis-testing. Provides an overview of experimental and survey research methods, with introduction to qualitative research, model-building, and research using secondary data. Prerequisites: Ph.D. students only; instructor's consent.

**MRKTNG 9020. Seminar in Advanced Research Methods in Marketing. 1-3 Credit.**

Familiarizes students with advanced research methods in marketing, emphasizing problem developmental and conceptualization, operationalization of research questions, measurement, and survey research. Prerequisites: Marketing [MRKTNG] 9010 or equivalent; Ph.D. students only; instructor's consent.

**MRKTNG 9030. Seminar in Applied Multivariate Analysis in Marketing. 1-3 Credit.**

Familiarizes students with multivariate analysis of data used for research in marketing. Emphasizes application of multivariate methods, presentation of set, performing preliminary assessment of data quality and distribution, assessing measurement quality, and conducting a variety of multivariate and structural equation models, regression, logistic regression, discriminate analysis, cluster analysis, multi-way frequency analysis, and ANOVA. Prerequisites: basic course in multivariate statistical methods; Ph.D. students only; instructor's consent.

**MRKTNG 9090. Research in Marketing. 1-99 Credit.**

Thesis research for Ph.D. degree. Graded on a S/U basis only. Prerequisite: Ph.D. students only.

**MRKTNG 9101. Current Topics Seminar in Marketing. 1-3 Credit.**

Reading and critical evaluation of selected current marketing literature and research. Graded on S/U basis only. Prerequisites: Ph.D. students only. May be repeated.

**MRKTNG 9185. Doctoral Independent Study in Marketing. 1-3 Credit.**

Independent study of a marketing topic or research project. Arranged in consultation with a graduate faculty member. Prerequisite: Ph.D. students only; instructor's consent. Graded on S/U basis only.

**MRKTNG 9210. Seminar in Marketing Strategy. 1-3 Credit.**

Focuses on research topics that pertain to strategic marketing programs and decisions, such as marketing productivity, services marketing, product innovation management, and pricing, among others. Coverage is also given to defining the domain of research in marketing and to the development and use of related theories. Prerequisites: Ph.D. students only; instructor's consent.

**MRKTNG 9220. Seminar Marketing Models. 1-3 Credit.**

Familiarizes students with quantitative modeling approaches to address a variety of marketing problems. The focus is on the nature, relevance, and properties of mathematical models and analytical methods that are employed to address various types of marketing decisions. Students will gain an understanding of the process of model-building, testing and implementation. Prerequisites: Ph.D students only; instructor's consent.

**MRKTNG 9230. Seminar in Consumer Behavior. 1-3 Credit.**

Exposes doctoral students to perspectives on consumer behavior that draw from a variety of disciplines, including marketing, psychology, decision theory, sociology, and cultural anthropology. Students

also learn about the different methods researchers employ to study consumers. Covers both classic and contemporary literature. Students are encouraged to evaluate and synthesize existing literature in the pursuit of new research ideas. Prerequisites: Ph.D. students only; instructor's consent.

**MRKTNG 9600. Seminar in Marketing. 1-3 Credit.**

Readings, independent investigations and reports. May be repeated. Prerequisite: Ph.D. students only.

## Mathematics (MATH)

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**MATH\_0110. Intermediate Algebra. 3 Credits.**

Mathematics [MATH] 0110 is a preparatory course for college algebra that carries no credit towards any baccalaureate degree. However, the grade received in Mathematics [MATH] 0110 does count towards a student's overall GPA. The course covers operations with real numbers, graphs of functions, domain and range of functions, linear equations and inequalities, quadratic equations; operations with polynomials, rational expressions, exponents and radicals; equations of lines. Emphasis is also put on problem-solving. Prerequisites: Elementary College Algebra or equivalent. Placement in Mathematics [MATH] 0110 based on the student's ACT math score or equivalent, in addition to other criteria.

**MATH 1100. College Algebra. 3 Credits.**

A review of exponents, order of operations, factoring, and simplifying polynomial, rational, and radical expressions. Topics include: linear, quadratic, polynomial, rational, inverse, exponential, and logarithmic functions and their applications. Students will solve equations involving these functions, and systems of linear equations in two variables, as well as inequalities. Prerequisite: Mathematics [MATH] 0110 or a sufficient score on the ALEKS exam. This course is offered in both 3 day and 5 day versions. See the math placement website for specific requirements. A student may receive at most 5.0 credit hours among the Mathematics courses 1100, 1120, 1140, and 1160.

**MATH 1140. Trigonometry. 2 Credits.**

Prerequisite: Math [MATH] 1100 or sufficient ALEKS score. A student may receive only 5 credits from among Math [MATH] 1100, Math [MATH] 1140, and Math [MATH] 1160. A Student may receive at most 5.0 credit hours from the Mathematics courses 1100, 1120, 1140, and 1160.

**MATH 1160. Precalculus Mathematics. 5 Credits.**

Review of elementary algebra. Background material for Mathematics 1500, including algebraic, trigonometric, logarithmic, exponential functions. Prerequisites: B+ or better in Math [MATH] 0110 (at MU), or Math 1100, or sufficient ALEKS score. A student may receive at most 5 credits from among Math [MATH] 1100, Math [MATH] 1140, and Math [MATH] 1160. A student may receive at most 5 credit hours from among the Mathematics courses 1100, 1120, 1140, and 1160.

**MATH 1300. Finite Mathematics. 3 Credits.**

A selections of topics in finite mathematics such as: basic financial mathematics, counting methods and basic probability and statistics, systems of linear equations and matrices. Prerequisites: Math [MATH] 1100, or Math [MATH] 1160, or both a College Algebra exemption and sufficient ALEKS score. Warning: without a College Algebra exemption, a sufficient ALEKS score will not suffice unless it is a proctored exam (for Math [MATH] 1100 credit).

**MATH 1320. Elements of Calculus. 3 Credits.**

Introductory analytic geometry, derivatives, definite integrals. Primarily for Computer Science BA candidates, Economics majors, and students preparing to enter the College of BUS. No credit for students who have completed a calculus course. Prerequisite: Math [MATH] 1100, or Math [MATH] 1160, or sufficient ALEKS score. A student may receive credit for Math [MATH] 1320 or 1400, but not both. A student may receive at most 5 credit hours among the Mathematics courses 1320 or 1400 and 1500.

**MATH 1360. Geometric Concepts. 3 Credits.**

This course is primarily for education majors. This course covers topics of Euclidean geometry such as the study of points, lines, angles, polygons, circles, congruence, similarity, transformations, symmetry, area, surface area, arc length, and volume. Polyhedra, spheres, cones, and other solids are discussed. The course includes constructions and proofs, and uses inductive and deductive reasoning throughout. Prerequisite: Mathematics [MATH] 1100 or 1120 or equivalent. Math Reasoning Proficiency Course.

**MATH 1400. Calculus for Social and Life Sciences I. 3 Credits.**

The real number system, functions, analytic geometry, derivatives, integrals, maximum-minimum problems. No credit for students who have completed a calculus course. Prerequisite: grade of C- or better in Mathematics [MATH] 1100 or 1160, or sufficient ALEKS score. A student may receive credit for Mathematics [MATH] 1320 or 1400 but not both. A student may receive at most 5 units of credit among the Mathematics [MATH] 1320 or 1400 and 1500. Math Reasoning Proficiency Course.

**MATH 1500. Analytic Geometry and Calculus I. 5 Credits.**

Elementary analytic geometry, functions, limits, continuity, derivatives, antiderivatives, definite integrals. Prerequisite: grade of C- or better in Mathematics [MATH] 1160 or both 1100 and 1140 or sufficient ALEKS score. A student may receive at most 5 units of credit among the Mathematics [MATH] courses 1320 or 1400 and 1500. Math Reasoning Proficiency Course.

**MATH 1500H. Analytic Geometry and Calculus I - Honors. 5 Credits.**

Elementary analytic geometry, functions, limits, continuity, derivatives, antiderivatives, definite integrals. Prerequisites: Mathematics [MATH] 1160 or both 1100 and 1140 sufficient ALEKS score. Honors eligibility required. A student may receive at most 5 units of credit among the Mathematics [MATH] courses 1320 or 1400 and 1500. Math Reasoning Proficiency course.

**MATH 1601. Selected Topics in Mathematics-General. 1-3 Credit.**

The special topics covered may vary from term to term. This course may be repeated. Prerequisite: instructor's consent.

**MATH 1602. Selected Topics in Mathematics-Biological/Physical/Math. 1-3 Credit.**

The special topics covered may vary from term to term. This course may be repeated. Prerequisite: instructor's consent.

**MATH 1700. Calculus II. 5 Credits.**

Definite integrals, applications and techniques of integration, elementary transcendental functions, infinite series. Prerequisite: a grade of C- or better in Mathematics [MATH] 1500. Math Proficiency Reasoning course.

**MATH 1700H. Calculus II - Honors. 5 Credits.**

Definite integrals, applications and techniques of integration, elementary transcendental functions, infinite series. Prerequisite: a grade of C- or better in Mathematics [MATH] 1500. Honors eligibility required. Math Reasoning Proficiency course.

**MATH 1800. Introduction to Analysis I. 5 Credits.**

This course will cover the material taught in a traditional first semester calculus course at a more rigorous level. The focus of this course will be on proofs of basic theorems of differential and integral calculus. The topics to be covered include axioms of arithmetic, mathematical induction, functions, graphs, limits, continuous functions, derivatives and their applications, integrals, the fundamental theorem of calculus and trigonometric functions. Students in this class will be expected to learn to write clear proofs of mathematical assertions. Some previous exposure to calculus is helpful but not required. No credit for Mathematics [MATH] 1800 and 1320, 1400 or 1500. Prerequisites: ACT mathematics score of at least 31 and ACT composite of at least 30 or instructor's consent. Graded on A/F basis only.

**MATH 1900. Introduction to Analysis II. 5 Credits.**

This course is a continuation of Mathematics [MATH] 1800. In this course we shall cover uniform convergence and uniform continuity, integration, and sequences and series. The topics will be covered in a mathematically rigorous manner. No credit for Mathematics [MATH] 1900 and 1700 or 2100. Prerequisite: MATH 1800 or instructor's consent. Graded on A/F basis only.

**MATH 2100. Calculus for Social and Life Sciences II. 3 Credits.**

Riemann integral, transcendental functions, techniques of integration, improper integrals and functions of several variables. No credit for students who have completed two calculus courses. Prerequisites: Mathematics [MATH] 1320 or 1400 or 1500. Math Reasoning Proficiency Course.

**MATH 2140. Geometric Axioms and Structures. 3 Credits.**

Euclidean Geometry, Axiom systems, spherical geometry, finite geometries, and explorations with technology. Prerequisite: Mathematics [MATH] 1340 or 1360.

**MATH 2300. Calculus III. 3 Credits.**

Vectors, solid analytic geometry, calculus of several variables. Prerequisite: grade of C- or better in Mathematics [MATH] 1700. Mathematics Reasoning Proficiency.

**MATH 2300H. Calculus III - Honors. 3 Credits.**

Vectors, solid analytic geometry, calculus of several variables. Prerequisite: grade of C or better in Mathematics [MATH] 1700. Honors eligibility required. Math Proficiency course.

**MATH 2320. Discrete Mathematical Structures. 3 Credits.**

Sets, functions, logic, relations, induction, recursion, counting techniques, graphs, trees, algorithms. Prerequisites: one of Mathematics [MATH] 1700, 2340, or 2140. Math Reasoning Proficiency course.

**MATH 2340. Algebraic Structures. 3 Credits.**

Introduction to axiomatic mathematics with emphasis on rings and groups. Applications to elementary number theory. Prerequisite: Mathematics [MATH] 1300 and 1320 or instructor's consent.

**MATH 3000. Introduction to Advanced Mathematics. 3 Credits.**

Gateway to theoretical math courses. Focus on reading and writing math proofs/rigorously developing background needed in Adv Calc/Abstract Alg. Topics include logic, set theory, properties of functions and integers, the real number system, completeness of the real numbers, sequences of real numbers. Prerequisite: Mathematics [MATH] 1700 or permission of the instructor/department.

**MATH 4001. Topics in Mathematics-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Mathematics [MATH] 2300 and instructor's consent. Departmental consent for repetition.

**MATH 4002. Topics in Mathematics-Biological/Physical/Math. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Mathematics [MATH] 2300 and instructor's consent. Departmental consent for repetition.

**MATH 4060. Connecting Geometry to Middle and Secondary Schools. 3 Credits.**

Euclidean foundations, logic, Euler Characteristic, congruence, area, Pick's Theorem, volume, Cavalieri's Principle, surface area, similarity, symmetry, transformations, matrices, introduction to spherical geometry. Prerequisites: Mathematics [MATH] 1360 or 1500.

**MATH 4070. Connecting Algebra to Middle and Secondary Schools. 3 Credits.**

A detailed study of integer and rational arithmetic and algebra. Topics include: Binomial Theorem, induction, division algorithm, Euclid's Algorithm, Fundamental Theorem of Arithmetic, Pythagorean triples, modular arithmetic and generalizations to polynomials, matrices and other axiomatic structures. Prerequisite: Mathematics [MATH] 1320, enrollment is restricted to Math Education majors.

**MATH 4080. Calculus Connections. 3 Credits.**

Course topics include: sequences, series, functions, limits, continuity, differentiation, optimization, curve sketching, antidifferentiation, areas of plane regions, lengths of plane curves, areas of surfaces of revolution, and volumes of solids. Prerequisites: Mathematics [MATH] 1160, enrollment is restricted to Math Education majors.

**MATH 4100. Differential Equations. 3 Credits.**

Traditional introductory course in ordinary differential equations. Includes 1st and 2nd order linear differential equations with numerous applications; Laplace transforms; power series solutions; numerical methods, linear systems. Prerequisite: Grade of C- or above in Mathematics [MATH] 2300.

**MATH 4110. Advanced Calculus With Applications. 3 Credits.**

Linear mappings, Jacobi matrices and determinants, change of variables, vector fields, line and surface integrals, theorems of Green, Gauss and Stokes, sequences and series of functions, uniform convergence, special functions. Prerequisite: Mathematics [MATH] 2300.

**MATH 4120. Combinatorics. 3 Credits.**

Study of a variety of topics from combinatorial mathematics, especially graph theory and enumerative combinatorics. Topics include graph coloring, matchings and coverings, generating functions, recurrence relations, Polya's Enumeration Theorem, introduction to Ramsey theory. Prerequisites: Mathematics [MATH] 2320, or instructor's consent.

**MATH 4140. Matrix Theory. 3 Credits.**

Basic properties of matrices, determinants, vector spaces, linear transformations, eigenvalues, eigenvectors, and Jordan normal forms. Introduction to writing proofs. Prerequisite: Grade of C- or better in Mathematics [MATH] 2300 or 2320.

**MATH 4150. History of Mathematics. 3 Credits.**

This is a history course with mathematics as its subject. Includes topics in the history of mathematics from early civilizations onwards. The growth of mathematics, both as an abstract discipline and as a subject which



interacts with others and with practical concerns, is explored. Pre- or Co-requisite: Mathematics [MATH] 2300 or 2340.

**MATH 4300. Numerical Analysis. 3 Credits.**

Machine arithmetic, approximation and interpolation, numerical differentiation and integration, nonlinear equations, linear systems, differential equations, error analysis. Selected algorithms will be programmed for solution on computers. Prerequisites: Grade of C- or better in Mathematics [MATH] 2300 and 4100.

**MATH 4310. Numerical Linear Algebra. 3 Credits.**

Solution of linear systems of equations by direct and iterative methods. Calculation of eigenvalues and eigenvectors of matrices. Selected algorithms programmed for solution on computers. Prerequisites: Mathematics [MATH] 2300 and familiarity with software such as Mathematica, MatLab, Maple, etc.

**MATH 4315. Introduction to Mathematical Statistics. 3 Credits.**

(same as Statistics [STAT] 4710). Introduction to theory of probability and statistics using concepts and methods of calculus. Prerequisites: Mathematics [MATH] 2300 or instructor's consent.

**MATH 4320. Introduction to Probability Theory. 3 Credits.**

(same as Statistics [STAT] 4750). Probability spaces; random variables and their distributions; repeated trials; probability limit theorems. Prerequisites: Mathematics [MATH] 2300 or instructor's consent.

**MATH 4325. Linear Programming. 3 Credits.**

Linear dependence and rank in vector spaces in  $R^n$ , Farkas' Lemma, Polyhedral Decomposition. Strong duality and complementary theorems. The simplex method, revised simplex, and sensitivity analysis. Primal Dual simplex method and network simplex methods. Computational Complexity and Karmarkar's Algorithm. Prerequisites: Mathematics [MATH] 4140 or instructor's consent.

**MATH 4330. Theory of Numbers. 3 Credits.**

Divisibility, factorization, arithmetic functions, means value theorems, distribution of prime numbers, congruences, primitive roots, character theory, Riemann zeta function, and Dirichlet L-functions. Prerequisites: Mathematics [MATH] 2300; recommended 2320 or 2340, and 4940/7940.

**MATH 4335. College Geometry. 3 Credits.**

Euclidean geometry from an advanced viewpoint. Synthetic and coordinate methods will be used. The Euclidean group of transformations will be studied. Prerequisite: Mathematics [MATH] 2300.

**MATH 4340. Projective Geometry. 3 Credits.**

Basic ideas and methods of projective geometry built around the concept of geometry as the study of invariants of a group. Extensive treatment of collineations. Prerequisite: Mathematics [MATH] 2300.

**MATH 4345. Foundations of Geometry. 3 Credits.**

Coordination of affine, projective planes by means of various kinds of algebraic structures: planar ternary rings, Veblen-Wedderburn systems, divisions rings, skew fields, and fields. Prerequisite: Mathematics [MATH] 2300.

**MATH 4350. Introduction to Non-Euclidean Geometry. 3 Credits.**

Account of rise, development of non-Euclidean geometries. Intensive study of plane hyperbolic geometry. Prerequisite: Mathematics [MATH] 2300.

**MATH 4355. Investment Science I. 3 Credits.**

Deterministic cash flow streams. The present value. Bonds, bonds' yield, duration. The term structure of interest rates. Single-period random yield analysis. Random returns. Portfolio mean-variance analysis. Markovitz

model. Prerequisites: Mathematics [MATH] 2300 and either Statistics [STAT] 2500 or STAT 4710/ MATH 4315, or instructor's consent.

**MATH 4360. Actuarial Mathematics. 3 Credits.**

Basic actuarial methods, mathematical population studies and models of population growth. Compound interest and annuities certain. Values of endowment and annuities, calculation of premiums, surrender values. Stochastic models of populations growth. Prerequisite: Mathematics [MATH] 2300 and either Statistics [STAT] 2500 or STAT 4710/MATH 4315, or instructor's consent. No variable credit.

**MATH 4370. Actuarial Modeling I. 3 Credits.**

This course covers the concepts underlying the theory of interest and their applications to valuation of various cash flows, annuities certain, bonds, and loan repayment. This course is designed to help students prepare for Society of Actuaries exam FM (Financial Mathematics). It is oriented towards problem solving techniques applied to real-life situations and illustrated with previous exam problems. Prerequisites: grade of C-or better in Mathematics [MATH] 2300.

**MATH 4371. Actuarial Modeling II. 3 Credits.**

This course covers the actuarial models and their applications to insurance and other business decisions. It is a helpful tool in preparing for the Society of Actuaries exam M (Actuarial Models), and it is oriented towards problem solving techniques illustrated with previous exam problems. Prerequisites: Mathematics [MATH] 2300 and 4320 or Statistics [STAT] 4750. Students are encouraged to take MATH 4355 prior to this course.

**MATH 4400. Introduction to Topology. 3 Credits.**

Topics from topology of Euclidean spaces, generalizations to metric spaces and topological spaces. Fundamentals of point set topology. Prerequisite: Mathematics [MATH] 2300.

**MATH 4500. Applied Analysis. 3 Credits.**

Solution of the standard partial differential equations (wave, heat, Laplace's eq.) by separation of variables and transform methods; including eigenfunction expansions, Fourier and Laplace transform. Boundary value problems, Sturm-Liouville theory, orthogonality, Fourier, Bessel, and Legendre series, spherical harmonics. Prerequisite: Mathematics [MATH] 4100.

**MATH 4510. Higher Algebra. 3 Credits.**

Introduction to rings, integral domains, fields, groups. Prerequisites: Mathematics [MATH] 2300 or 2320.

**MATH 4520. Statistical Inference I. 3 Credits.**

(same as Statistics [STAT] 4760). Sampling; point estimation; sampling distribution; tests of hypotheses; regression and linear hypotheses. Prerequisite: Mathematics [MATH] 4320.

**MATH 4540. Mathematical Modeling I. 3 Credits.**

Solution of problems from industry, physical, social and life sciences, economics, and engineering using mathematical models. Prerequisites: 3 semesters of calculus and some exposure to ordinary differential equations or instructor's consent.

**MATH 4560. Nonlinear Dynamics, Fractals and Chaos. 3 Credits.**

Conceptual introduction to nonlinear dynamics, bifurcation and stability of steady states, chaos in nonlinear differential equations and maps, fractal dimension, strange attractors, and applications to physical science. Prerequisite: Mathematics [MATH] 4100/ 7100, 4140/7140, and familiarity with software such as MATHEMATICA, MATLAB, or MAPLE.

**MATH 4570. Fluid Dynamics. 3 Credits.**

Mathematical theory of fluid dynamics and applications. Prerequisites: Mathematics [MATH] 2300.

**MATH 4580. Mathematical Modeling II. 3 Credits.**

Solution of problems from industry, physical, social and life sciences, economics, and engineering using mathematical models. More general classes of problems than in Mathematics 4540 will be considered. Prerequisites: 3 semesters of calculus and some exposure to ordinary differential equations or instructor's consent. Mathematics [MATH] 4540 is not a prerequisite.

**MATH 4590. Investment Science II. 3 Credits.**

Derivative securities, forward and future contracts, forward prices, hedging. Mean-variance hedging. Stochastic models of asset dynamics, random walks and binomial models. Capital budgeting, optimal portfolios. Basic option theory, put-call parity. Prerequisite: Mathematics [MATH] 2300 and Statistics [STAT] 2500 or STAT 4710/MATH 4315, or instructor's consent. Recommended: MATH 4355. No variable credit.

**MATH 4700. Advanced Calculus of One Real Variable I. 3 Credits.**

Basic topology of the real line, numerical sequences and series, continuity, differentiability, Riemann integration, uniform convergence, power series. Prerequisite: Mathematics [MATH] 3000.

**MATH 4720. Introduction to Abstract Algebra I. 3 Credits.**

Basic properties of integers, fundamental theorem of arithmetic, introduction to groups, rings and fields. Prerequisite: Mathematics [MATH] 3000.

**MATH 4800. Advanced Calculus for One Real Variable II. 3 Credits.**

Continuation of Advanced Calculus for functions of a single real variable. Topics include sequences and series of functions, power series and real analytic functions, Fourier series. Prerequisites: Mathematics [MATH] 4700/7700 or permission of the instructor.

**MATH 4900. Advanced Multivariable Calculus. 3 Credits.**

This is a course in calculus in several variables. The following is core material: Basic topology of  $n$ -dimensional Euclidian space; limits and continuity of functions; the derivative as a linear transformation; Taylor's formula with remainder; the Inverse and Implicit Function Theorems, change of coordinates; integration (including transformation of integrals under changes of coordinates); Green's Theorem. Additional material from the calculus of several variables may be included, such as Lagrange multipliers, differential forms, etc. Prerequisite: Mathematics [MATH] 4700.

**MATH 4920. Introduction to Abstract Linear Algebra. 3 Credits.**

Study of vector spaces over arbitrary fields: topics include linear maps on finite dimensional vector spaces, bilinear and multi-linear forms, invariant subspaces and canonical forms. Prerequisite: Mathematics [MATH] 4720.

**MATH 4940. Introduction to Complex Variables. 3 Credits.**

Complex functions, contour integration, power series, residues and poles, conformal mapping. Prerequisites: Mathematics [MATH] 4110 or 4700.

**MATH 4960. Special Readings in Mathematics. 1-3 Credit.**

Prerequisites: Mathematics [MATH] 2300 and instructor's consent.

**MATH 4970. Senior Seminar in Mathematics. 3 Credits.**

Seminar with student presentations, written projects, and problem solving. May be used for the capstone requirement. Prerequisite: 12 hours of mathematics courses numbered 4000 or above.

**MATH 4980. Mathematics Problem Solving. 3 Credits.**

Creative advanced problem solving bringing together methods such as integration, probability and Euclidean geometry. Prerequisite: Mathematics [MATH] 4140 and another 4000 level Mathematics course, or instructor's consent.

**MATH 4996. Honors in Mathematics. 2 Credits.**

Special work for senior B.A. Honors and B.S. Honors candidates.

**MATH 7001. Topics in Mathematics-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: graduate standing and Mathematics [MATH] 2300 and instructor's consent. Departmental consent for repetition.

**MATH 7060. Connecting Geometry to Middle and Secondary Schools. 3 Credits.**

Euclidian foundations, basic concepts of symbolic logic, polyhedra, Euler Characteristic, congruence, area, Picks Theorem, volume, Cavalier's Principles, surface area, similarity, reflections, translations, rotations, symmetry, vectors, general transformations, determinants, matrices, transformations using matrices, brief introduction to spherical geometry. Prerequisite: Mathematics [MATH] 1360 or 1500, enrollment in restricted to Math Education majors.

**MATH 7070. Connecting Algebra to Middle and Secondary Schools. 3 Credits.**

A detailed study of integer and rational arithmetic and algebra. Topics include: Binomial Theorem, induction, division algorithm, Euclid's Algorithm, Fundamental Theorem of Arithmetic, Pythagorean triples, modular arithmetic and generalizations to polynomials, matrices and other axiomatic structures. Prerequisite: Mathematics [MATH] 1320, enrollment is restricted to Math Education majors.

**MATH 7080. Connect Calculus to Middle and Secondary Schools. 3 Credits.**

Course topics include: sequences, series functions, limits, continuity, differentiation, optimization, curve sketching, antidifferentiation, area of plane regions, lengths of plane curves, areas of surfaces of revolution, and volumes of solids, Prerequisite: Mathematics [MATH] 1160, enrollment is restricted to Math Education majors.

**MATH 7100. Differential Equations. 3 Credits.**

Traditional introductory course in ordinary differential equations. Includes 1st and 2nd order linear differential equations with numerous applications; Laplace transforms; power series solutions; numerical methods, linear systems. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7110. Advanced Calculus With Applications. 3 Credits.**

Linear mappings, Jacobi matrices and determinants, change of variables, vector fields, line and surface integrals, theorems of Green, Gauss and Stokes, sequences and series of functions, uniform convergence, special functions. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7140. Matrix Theory. 3 Credits.**

Basic properties of matrices, determinants, vector spaces, linear transformations, eigenvalues, eigenvectors, and Jordan normal forms. Introduction to writing proofs. Prerequisite: graduate standing and one of Mathematics [MATH] 2300, 2320, 2120 or 2340.

**MATH 7150. History of Mathematics. 3 Credits.**

This is a history course with mathematics as its subject. Includes topics in the history of mathematics from early civilizations onwards. The growth

of mathematics, both as an abstract discipline and as a subject which interacts with others and with practical concerns, is explored. Pre- or Co-requisite: Mathematics [MATH] 2300 or 2340 and graduate standing.

**MATH 7300. Numerical Analysis. 3 Credits.**

Machine arithmetic, approximation and interpolation, numerical differentiation and integration, nonlinear equations, linear systems, differential equations, error analysis. Selected algorithms will be programmed for solution on computers. Prerequisites: graduate standing and Mathematics [MATH] 2300 and MATH 4100 or equivalent.

**MATH 7310. Numerical Linear Algebra. 3 Credits.**

Solution of linear systems of equations by direct and iterative methods. Calculation of eigenvalues and eigenvectors of matrices. Selected algorithms programmed for solution on computers. Prerequisites: graduate standing and Mathematics [MATH] 2300 and prior experience writing programs in Mathematica and /or in a computer language such as Fortran, Pascal, or C. Recommended: Mathematics [MATH] 4140.

**MATH 7315. Introduction to Mathematical Statistics. 3 Credits.**

(same as Statistics [STAT] 7710). Introduction to theory of probability and statistics using concepts and methods of calculus. Prerequisites: graduate standing and Mathematics [MATH] 2300 or instructor's consent.

**MATH 7320. Introduction to Probability Theory. 3 Credits.**

(same as Statistics [STAT] 7750). Probability spaces; random variables and their distributions; repeated trials; probability limit theorems. Prerequisites: graduate standing and Mathematics [MATH] 2300 or instructor's consent.

**MATH 7330. Theory of Numbers. 3 Credits.**

Divisibility, factorization, arithmetic functions, means value theorems, distribution of prime numbers, congruences, primitive roots, character theory, Riemann zeta function, and Dirichlet L-functions. Prerequisites: graduate standing and Mathematics [MATH] 2300; recommended 2320 or 2340, and 4940/7940.

**MATH 7335. College Geometry. 3 Credits.**

Euclidean geometry from an advanced viewpoint. Synthetic and coordinate methods will be used. The Euclidean group of transformations will be studied. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7340. Projective Geometry. 3 Credits.**

Basic ideas and methods of projective geometry built around the concept of geometry as the study of invariants of a group. Extensive treatment of collineations. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7345. Foundations of Geometry. 3 Credits.**

Coordination of affine, projective planes by means of various kinds of algebraic structures: planar ternary rings, Veblen-Wedderburn systems, division rings, skew fields, and fields. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7350. Introduction to Non-Euclidean Geometry. 3 Credits.**

Account of rise, development of non-Euclidean geometries. Intensive study of plane hyperbolic geometry. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7355. Investment Science I. 3 Credits.**

Deterministic cash flow streams. The present value. Bonds, bonds' yield, duration. The term structure of interest rates. Single-period random yield analysis. Random returns. Portfolio mean-variance analysis. Markovitz model. Prerequisites: Mathematics [MATH] 2300 and either Statistics

[STAT] 2500 or Statistics [STAT] 4710/Mathematics [MATH] 4315, or instructor's consent.

**MATH 7360. Actuarial Mathematics. 3 Credits.**

Basic actuarial methods, mathematical population studies and models of population growth. Compound interest and annuities certain. Values of endowment and annuities, calculation of premiums, surrender values. Stochastic models of populations growth. Prerequisite: Mathematics [MATH] 2300 and either Statistics [STAT] 2500 or Statistics [STAT] 4710/Mathematics [MATH] 4315, or instructor's consent. No variable credit.

**MATH 7370. Actuarial Modeling I. 3 Credits.**

This course covers the main probability tools applied to financial risk modeling, and the financial mathematics concepts used in calculating present and accumulated values for various cash flows. It is a helpful tool in preparing for the Society of Actuaries exams P (Probability) and FM (Financial Mathematics), and it is oriented towards problem solving techniques illustrated with previous exam problems. Prerequisites: Mathematics [MATH] 2300, Mathematics [MATH] 4320/Statistics [STAT] 4750. Students are encouraged to take Mathematics [MATH] 4355 prior to this course.

**MATH 7371. Actuarial Modeling II. 3 Credits.**

This course covers the actuarial models and their applications to insurance and other business decisions. It is a helpful tool in preparing for the Society of Actuaries exam (M) (Actuarial Models), and it is oriented towards problem solving techniques illustrated with previous exam problems. Prerequisites: Mathematics [MATH] 2300, Mathematics [MATH] 4320/Statistics [STAT] 4750. Student are encouraged to take Mathematics [MATH] 4355 prior to this course.

**MATH 7400. Introduction to Topology. 3 Credits.**

Topics from topology of Euclidean spaces, generalizations to metric spaces and topological spaces. Fundamentals of point set topology. Prerequisite: graduate standing and Mathematics [MATH] 2300.

**MATH 7500. Applied Analysis. 3 Credits.**

Solution of the standard partial differential equations (wave, heat, Laplace's eq.) by separation of variables and transform methods; including eigenfunction expansions, Fourier and Laplace transform. Boundary value problems, Sturm-Liouville theory, orthogonality, Fourier, Bessel, and Legendre series, spherical harmonics. Prerequisite: graduate standing and Mathematics [MATH] 4100/7100.

**MATH 7510. Higher Algebra. 3 Credits.**

Introduction to rings, integral domains, fields, groups. Prerequisites: graduate standing and Mathematics [MATH] 2300 OR 2320.

**MATH 7520. Statistical Inference I. 3 Credits.**

(same as Statistics [STAT] 7760). Sampling; point estimation; sampling distribution; tests of hypotheses; regression and linear hypotheses. Prerequisite: graduate standing and Mathematics [MATH] 4320/7320.

**MATH 7540. Mathematical Modeling I. 3 Credits.**

Solution of problems from industry, physical, social and life sciences, economics, and engineering using mathematical models. Prerequisites: graduate standing and 3 semesters of calculus and some exposure to ordinary differential equations or instructor's consent.

**MATH 7560. Nonlinear Dynamics, Chaos and Fractals. 3 Credits.**

Conceptual introduction to nonlinear dynamics, bifurcation and stability of steady states, chaos in nonlinear differential equations and maps, fractal dimension, strange attractors, and applications to physical science. Prerequisite: graduate standing and Mathematics [MATH] 4100/7100,

4140/7140, and familiarity with software such as MATHEMATICA, MATLAB, or MAPLE.

**MATH 7570. Fluid Dynamics and Geophysical Applications. 3 Credits.**

Mathematical theory of fluid dynamics and applications to meteorology and oceanography. Prerequisites: graduate standing and Mathematics [MATH] 2300 and instructor's consent.

**MATH 7580. Mathematical Modeling II. 3 Credits.**

Solution of problems from industry, physical, social and life sciences, economics, and engineering using mathematical models. More general classes of problems than in Mathematics [MATH] 7540 will be considered. Prerequisites: 3 semesters of calculus and some exposure to ordinary differential equations or instructor's consent. Mathematics [MATH] 7540 is not a prerequisite.

**MATH 7590. Investment Science II. 3 Credits.**

Derivative securities, forward and future contracts, forward prices, hedging. Mean-variance hedging. Stochastic models of asset dynamics, random walks and binomial models. Capital budgeting, optimal portfolios. Basic option theory, put-call parity. Prerequisite: Mathematics [MATH] 2300 and either Statistics [STAT] 2500 or Statistics [STAT] 4710/ Mathematics [MATH] 4315, or instructor's consent. Recommended: Mathematics [MATH] 4355. No variable credit.

**MATH 7620. Differential Geometry I. 3 Credits.**

Metric properties of restricted portions of curves and surfaces in three-dimensional Euclidean space. Prerequisite: Mathematics [MATH] 2300.

**MATH 7700. Advanced Calculus of One Real Variable I. 3 Credits.**

Series of real numbers, limits of functions, continuity and uniform continuity, differentiability, and Riemann integration. Prerequisite: graduate standing and Mathematics [MATH] 2300. Recommended Mathematics [MATH] 4140 and one other mathematics course number above 2300.

**MATH 7720. Introduction to Abstract Algebra I. 3 Credits.**

Basic properties of integers, fundamental theorem of arithmetic, introduction to groups, rings and fields. Prerequisite: Mathematics [MATH] 2300. Recommended: Mathematics [MATH] 4140 and one other Mathematics course numbered above 2300.

**MATH 7800. Advanced Calculus of One Real Variable II. 3 Credits.**

Continuation of Advanced Calculus for functions of a single real variable. Topics include sequences and series of functions, power series and real analytic functions, Fourier series. Prerequisites: Mathematics [MATH] 4700/7700 or permission of the instructor.

**MATH 7900. Advanced Multivariable Calculus. 3 Credits.**

This is a course in calculus in several variables. The following is core material: Basic topology of  $n$ -dimensional Euclidean space; limits and continuity of functions; the derivative as a linear transformation; Taylor's formula with remainder; the Inverse and Implicit Function Theorems, change of coordinates; integration (including transformation of integrals under changes of coordinates); Green's Theorem. Additional material from the calculus of several variables may be included, such as Lagrange multipliers, differential forms, etc. Prerequisite: Mathematics [MATH] 4700/7700.

**MATH 7920. Introduction to Abstract Linear Algebra. 3 Credits.**

Study of vector spaces over arbitrary fields: topics include linear maps on finite dimensional vector spaces, bilinear and multi-linear forms, invariant subspaces and canonical forms. Prerequisite: Mathematics [MATH] 4720/7720.

**MATH 7940. Introduction to Complex Variables. 3 Credits.**

Complex functions, contour integration, power series, residues and poles, conformal mapping. Prerequisites: graduate standing and Mathematics [MATH] 4110/7110 OR 4700/7700.

**MATH 7960. Special Readings in Mathematics. 1-3 Credit.**

Prerequisites: graduate standing and Mathematics [MATH] 2300 and instructor's consent.

**MATH 7970. Senior Seminar in Mathematics. 3 Credits.**

Seminar with student presentations, written projects, and problem solving. May be used for the capstone requirement. Prerequisite: 12 hours of mathematics courses numbered 4000 or above.

**MATH 7980. Mathematics Problem Solving. 3 Credits.**

Creative advanced problem solving bringing together methods such as integration, probability and Euclidean geometry. Prerequisite: graduate standing and Mathematics [MATH] 4140 and another 4000 level Mathematics course, or instructor's consent.

**MATH 8085. Problems in Mathematics. 1-3 Credit.**

Problems in Mathematics.

**MATH 8090. Master's Thesis Research in Mathematics. 3 Credits.**

Students will be required to complete an independent project. Topics are chosen in consultation with a faculty advisor and are subject to departmental consent. Graded on S/U basis only.

**MATH 8102. Topics in Algebra. 3 Credits.**

Advanced topics in algebra. Prerequisite: Mathematics [MATH] 8410.

**MATH 8190. Masters Project in Mathematics. 3 Credits.**

Masters Project in Mathematics.

**MATH 8202. Topics in Functional Analysis. 3 Credits.**

Prerequisite: graduate standing required.

**MATH 8210. Basic Algebra. 3 Credits.**

Accelerated problem solving course in linear and abstract algebra. Will prepare students for the algebra qualifying exam. Prerequisites: Mathematics [MATH] 4720, 4920, instructor's consent or equivalent. Corequisites: Mathematics [MATH] 8220 and 8250.

**MATH 8220. Basic Analysis. 3 Credits.**

Accelerated problem-solving course in advanced calculus and complex analysis. Will prepare students for the analysis qualifying exam. Prerequisites: Mathematics [MATH] 4700, 4900, 4940, instructor's consent or equivalent. Corequisites: Mathematics [MATH] 8210 and 8250.

**MATH 8250. Basic Topology and Geometry. 3 Credits.**

Topological spaces, differential manifolds, differential forms, integration of vector fields. Prerequisites: Mathematics [MATH] 4700, 4900, 4140, instructor's consent or equivalent. Corequisites: Mathematics [MATH] 8210 and 8220.

**MATH 8302. Topics in Harmonic Analysis. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 8402. Topics in Mathematical Physics. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 8410. Algebra I. 3 Credits.**

Theory of algebraic structures--groups, rings, fields, algebraic and transcendental extensions of fields. Prerequisites: Mathematics [MATH] 4720 and 4920, or equivalent.

**MATH 8411. Algebra II. 3 Credits.**

Theory of modules, Galois theory and additional topics to be selected by the instructor. Prerequisite: Mathematics [MATH] 8410 or equivalent.

**MATH 8420. Theory of Functions of Real Variables I. 3 Credits.**

Properties of functions of one real variable. Lebesgue measure and integration on the line. Prerequisites: Mathematics [MATH] 4700/7700 and 4900/7900, or equivalent.

**MATH 8421. Theory of Functions of Real Variables II. 3 Credits.**

Continuation of Mathematics 8420. General measure and integration theory. Elements of the theory of Hilbert and Banach spaces, linear functions and linear operators. Prerequisite: Mathematics [MATH] 8420.

**MATH 8425. Complex Analysis I. 3 Credits.**

Rigorous introduction to the theory of functions of a complex variable. Prerequisite: Mathematics [MATH] 4900/7900 or equivalent.

**MATH 8426. Complex Analysis II. 3 Credits.**

Analytic continuation, Riemann surfaces, entire and meromorphic functions, selected topics. Prerequisites: Mathematics [MATH] 8425.

**MATH 8440. Advanced Ordinary Differential Equations I. 3 Credits.**

Topics from existence and uniqueness theorems, plane autonomous systems, periodicity and boundedness of solutions of second order nonlinear equations, perturbation theory, Sturm-Liouville systems, behavior of solutions at singularities. Prerequisite: Mathematics [MATH] 4700/7700 or equivalent.

**MATH 8441. Advanced Ordinary Differential Equations II. 3 Credits.**

Continuation of Mathematics [MATH] 8440.

**MATH 8442. Calculus of Variations I. 3 Credits.**

Development of necessary conditions and of sufficient conditions for nonparametric and parametric problems. Hamilton's principle, related topics. Prerequisite: instructor's consent.

**MATH 8445. Partial Differential Equations I. 3 Credits.**

Fourier and integral transforms, first and second order partial differential equations, methods of characteristics, Laplace's equation, Dirichlet and Neumann problems, Green's functions and maximum principles. Prerequisite: Mathematics [MATH] 4500 or instructor's consent.

**MATH 8446. Partial Differential Equations II. 3 Credits.**

The Cauchy-Kovalevski theorem, the Lewy example, the heat operator, the wave operator, Sobolev spaces, local regularity of elliptic boundary value problems. Prerequisite: Mathematics [MATH] 8445, 8420 recommended.

**MATH 8450. Differential Geometry for Scientists and Engineers. 3 Credits.**

Tensors and multilinear forms. Connections, covariant differentiation, geodesics and curvature on Riemannian and pseudo Riemannian manifolds. Applications to special relativity and general relativity. Prerequisites: Mathematics [MATH] 4110 and some knowledge of Matrix Theory.

**MATH 8460. Mathematical Finance I. 3 Credits.**

(same as Finance [FINANC] 8340). Financial instruments and derivative: stocks, bonds, futures option prices on interest rates, swaps, etc. Mathematical models of stock price fluctuations. Interest rates and options on interest rates. Swaps. Open markets and properties of stock option prices. Stochastic models. Binomial trees. Continuous time stochastic modeling. No arbitrage modeling. European and American options. BlackScholes model and differential equation, for the price of European option. Exotic options. Interest rate models. Prerequisite:

graduate standing in Mathematics. Knowledge of elementary probability or instructor's consent.

**MATH 8461. Mathematical Finance II. 3 Credits.**

Diffusion Processes as models for stock price fluctuations. Contingent claims and arbitrage. Mathematical analysis of risk neutral valuation of contingent claims. Self-financing portfolios and hedging. Hedging contingent claims. Partial differential equations for valuation of derivative securities. Completeness of the markets and hedging. Parity relations and delta hedging. Several underlying assets. Prerequisites: knowledge of advance probability/stochastic processes or instructor's consent; recommended Mathematics [MATH] 8460.

**MATH 8465. Mathematical Methods of Risk Theory. 3 Credits.**

Probability aspects of Risk. Claim number processes. Accumulated claim number processes. Retentions and Reserves. Mathematics of reinsurance. Ruin probability calculations. Stability and dividends policy. Utility as criterion of stability. The problem of risk exchange. Prerequisite: knowledge of elementary probability or the instructor's consent; graduate standing.

**MATH 8470. Advanced Numerical Analysis. 3 Credits.**

Analysis and implementation of numerical algorithms selected from approximation theory, splines, quadrature, nonlinear systems, ordinary differential equations, and optimization. Prerequisites: Mathematics [MATH] 4700, 4300 or equivalent, and 4140.

**MATH 8480. Advanced Probability. 3 Credits.**

(same as Statistics [STAT] 9810). Measure theoretic probability theory. Characteristic functions; conditional probability and expectation; sums of independent random variables including strong law of large numbers and central limit problem. Prerequisites: Mathematics [MATH] 4320 or 8220; or instructor's consent.

**MATH 8502. Topics of Geometry. 1-99 Credit.**

Prerequisite: instructor's consent.

**MATH 8587. Topology Seminar. 1-99 Credit.**

Topology Seminar.

**MATH 8602. Topics in Financial Mathematics and Insurance. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 8615. Algebraic Geometry I. 3 Credits.**

Affine and projective varieties and schemes; nullstellensatz; Zariski topology, morphisms and rational maps; divisors and linear systems; topics from curves, surfaces, Grassmann varieties; commutative algebra and homological algebra as needed. Prerequisite: Mathematics [MATH] 8410.

**MATH 8616. Algebraic Geometry II. 3 Credits.**

Continuation of Mathematics [MATH] 8615. Prerequisite: Mathematics [MATH] 8615.

**MATH 8618. Introduction to Algebraic Topology. 3 Credits.**

Development of singular homology theory; reference to other homology and cohomology theories. Introduction to homological algebra. Prerequisite: Mathematics [MATH] 8250.

**MATH 8628. Functional Analysis I. 3 Credits.**

Linear topological spaces, Banach spaces, Hilbert spaces. Operator theory, including the Hahn-Banach, uniform boundedness and closed graph theorems. Prerequisite: Mathematics [MATH] 4900 and instructor's consent or Mathematics [MATH] 8420.

**MATH 8629. Functional Analysis II. 3 Credits.**

Topological vector spaces, duality theory, Banach algebras. Prerequisite: Mathematics [MATH] 8628.

**MATH 8630. Harmonic Analysis I. 3 Credits.**

An introduction to Fourier Analysis in one and higher Dimensions. Topics include Fourier Series, conjugate functions, Fourier transforms, distributions, interpolation, and maximal functions. Prerequisite: Mathematics [MATH] 8420.

**MATH 8631. Harmonic Analysis II. 3 Credits.**

Singular integrals, Littlewood-Paley theory, Hardy spaces, bounded mean oscillation, weighted norm inequalities, boundary value problems, and analysis on groups. Prerequisite: Mathematics [MATH] 8630.

**MATH 8642. Nonlinear Differential Equations. 3 Credits.**

Existence theorems; criteria for periodic solutions; boundedness of solutions; perturbation theory. Emphasizes second order equations. Prerequisites: Mathematics [MATH] 4100 and 4110 or 4700.

**MATH 8648. Advanced Mathematics for the Physical Sciences. 3 Credits.**

Study of selected topics in quantum and statistical mechanics. Schrodinger operators and their self-adjointness. Semi-classical methods and their application to estimation of eigenvalues. Partition functions in many body problems and methods of estimation. Prerequisites: instructor's consent, Mathematics [MATH] 4110, 4700, Physics [PHYSICS] 8660 recommended.

**MATH 8650. Differentiable Manifolds and Riemannian Geometry. 3 Credits.**

Tensor product spaces and tensor fields on manifolds. Differentiation and integration of differential forms. Riemannian geometry and applications. Prerequisites: Mathematics [MATH] 4700 or 4400.

**MATH 8655. General Topology I. 3 Credits.**

Introduction to axiomatic theory of general topology. Continuous functions and homeomorphisms. Convergence in abstract topological spaces. Compact and locally compact spaces. Connectedness. Metrizable spaces. Prerequisites: Mathematics [MATH] 4900, 4400 or instructor's consent.

**MATH 8680. Stochastic Processes. 3 Credits.**

(same as Statistics 9820). Markov processes, martingales, orthogonal sequences, processes with independent and orthogonal increments, stationary, linear prediction. Prerequisite: Mathematics [MATH] 8480.

**MATH 8702. Topics in Applied Mathematics. 1-99 Credit.**

Selected topics in applied mathematics drawn from variety of areas: partial differential equations, tensor analysis, calculus of variations, asymptotic methods, integral equations, advanced theory of transforms and distributions, numerical analysis.

**MATH 8787. Numerical Mathematics Seminar. 1-99 Credit.**

Numerical Mathematics Seminar.

**MATH 9090. Doctoral Dissertation Research in Mathematics. 1-9 Credit.**

Graded on a S/U basis only.

**MATH 9187. Algebra Seminar. 1-99 Credit.**

Algebra Seminar.

**MATH 9287. Functional Analysis Seminar. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 9387. Harmonic Analysis Seminar. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 9487. Mathematical Physics Seminar. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 9502. Topics in Topology. 1-99 Credit.**

Advanced topics in topology or topological algebra.

**MATH 9587. Geometry Seminar. 1-99 Credit.**

Geometry Seminar.

**MATH 9687. Financial Mathematics Seminar. 1-99 Credit.**

Prerequisite: graduate standing.

**MATH 9702. Topics in Numerical Mathematics. 1-99 Credit.**

Prerequisite: instructor's consent.

**MATH 9787. Applied Mathematics Seminar. 1-99 Credit.**

Applied Mathematics Seminar.

**MATH 9887. Analysis Seminar. 1-99 Credit.**

Analysis Seminar.

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## Mechanical And Aerospace Engineering (MAE)

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**MAE 1000. Introduction to Mechanical Engineering. 1 Credit.**

Introduction to the mechanical engineering profession, the Mechanical and Aerospace Engineering Department and curriculum, and the core disciplines of mechanical engineering. Introduction to engineering problem solving, ethics, and design. Restricted to engineering students only.

**MAE 1001. Experimental Course. 1-99 Credit.**

Experimental course. For freshmen-level students. Content and credit hours to be listed in Schedule of Courses.

**MAE 2001. Experimental Course. 1-99 Credit.**

Experimental course. For sophomore-level students. Content and credit hours to be listed in Schedule of Courses.

**MAE 2100. Programming and Software Tools. 2 Credits.**

Introduction to the use of computers, programming, and software. Topics include MATLAB syntax and programming techniques, algorithm design, and programming with Excel spreadsheets. Prerequisite: Mathematics [MATH] 1700. Restricted to Mechanical Aerospace Engineering Students Only.

**MAE 2300. Thermodynamics. 3 Credits.**

(same as Engineering [ENGINR] 2300). Fluid properties, work and heat, first law, second law, entropy, applications to vapor and ideal gas processes. Prerequisites: Physics [PHYSICS] 2750.

**MAE 2600. Dynamics. 3 Credits.**

Basic fundamentals of particle and rigid body dynamics; energy and momentum methods. Prerequisite: grade of C or better in Engineering [ENGINR] 1200. Restricted to MAE students only.

**MAE 3100. Computational Methods for Engineering Design. 4 Credits.**

Introduction to numerical methods for linear system analysis, curve-fitting, integration and differentiation, and optimization. The numerical methods are demonstrated through computer implementation and application to engineering design problems. Prerequisites: Mechanical and Aerospace

Engineering [MAE] 2100; Math [MATH] 4100 concurrent. Restricted to MAE students only.

**MAE 3200. Engineering Materials. 4 Credits.**

The nature of the structure of engineering materials. The relationship of material structure to physical properties. Mechanical behavior of engineering materials. Prerequisites: Grade of C or better in Engineering [ENGINR] 2200 and Chemistry [CHEM] 1320. Restricted to MAE students only.

**MAE 3400. Fluid Mechanics. 3 Credits.**

A basic course in fluid mechanics. Topics include: fluid properties, hydrostatics, conservation laws, infinitesimal and finite control volume analysis, Navier-Stokes equations, dimensional analysis, internal and external flows. Prerequisites: Mechanical and Aerospace Engineering [MAE] 2600; Engineering [ENGINR] 2300 concurrent. Restricted to MAE students only.

**MAE 3600. Dynamic Systems and Control. 3 Credits.**

Modeling and analysis of dynamic systems and introduction to feedback control. Topics include dynamic modeling and response of mechanical, electrical, fluid, and thermal systems; and feedback control systems analysis. Prerequisites: Mechanical and Aerospace Engineering [MAE] 2600; 3100; Engineering [ENGINR] 2100 concurrent. Restricted to MAE students only.

**MAE 3800. Instrumentation and Measurements Laboratory. 3 Credits.**

Design and reporting of experimental investigations. Topics include instrument design equations, sources of error, and calibration. Survey of instruments to measure: voltage, resistance, current, time, frequency, displacement, velocity, acceleration, strain, force, and torque. Prerequisites: Engineering [ENGINR] 2100; 2200; Mechanical and Aerospace Engineering [MAE] 3600 concurrent. Restricted to MAE students only.

**MAE 3900. Mechanical Design I. 3 Credits.**

Kinematics of machinery, and introduction to finite element analysis. Topics include linkage analysis and design, cam design, and numerical stress analysis. The course involves a major design project. Prerequisites: Engineering [ENGINR] 2200 and Mechanical and Aerospace Engineering [MAE] 2600. May be repeated for credit. Graded on A/F basis only.

**MAE 4001. Topics in Mechanical and Aerospace Engineering. 3 Credits.**

Current and new technical developments in mechanical and aerospace engineering. Prerequisite: instructor's consent. Restricted to MAE students only.

**MAE 4085. Problems in Mechanical and Aerospace Engineering. 1-99 Credit.**

Special design, experimental and analytical problems in mechanical and aerospace engineering.

**MAE 4210. Aerospace Structures. 3 Credits.**

Fundamentals of the mechanics and design issues of aerospace structures. Analysis of thin skins with stiffeners for external surfaces, bulkheads and frames for shape support, and fasteners for holding components together. Prerequisites: Grade of C or better in Engineering [ENGINR] 2200. Graded on A/F basis only.

**MAE 4220. Materials Selection. 3 Credits.**

Study of the physical and mechanical metallurgy of alloy systems of interest in engineering applications. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3200. Restricted to MAE students only.

**MAE 4230. Nanomaterials. 3 Credits.**

The primary goal of this course is to introduce students into the new field of nanostructured materials. The emphasis of the course is to introduce the students into synthesis and characterization of nanomaterials, the behavior of such materials with nanoscale structures, and their technological applications. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200 or equivalent.

**MAE 4231. Transport Phenomena in Materials Processing. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 4231). Applications of fluid flow, heat transfer, and mass transfer in steady-state and unsteady-state materials processing with applications to metals, polymers, and ceramics. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200, 3400, 4300 (or equivalent courses; and Mathematics [MATH] 4100. Graded on A/F basis only.

**MAE 4240. Diffraction Methods in Materials Science. 3 Credits.**

Introduction to crystal structure and the use of x-rays and neutrons to study materials aspects including phase analysis, structure determination, residual stress and texture. Prerequisite: instructor's consent. Restricted to MAE students only.

**MAE 4250. Composite Materials. 3 Credits.**

A survey of composite materials used in engineering emphasizing fiber-reinforced composites but including laminate and particulate composites. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3200. Restricted to MAE students only.

**MAE 4260. Experimental Stress Analysis. 3 Credits.**

The course introduces basic concepts of stress and strain using elasticity theory. Single point and full-field experimental methods for stress and strain measurement, such as strain gages and photoelasticity, are discussed. Application of experimental methods in transducer development and design of structures will be covered. Prerequisite: senior standing.

**MAE 4270. Nondestructive Evaluation of Materials. 3 Credits.**

The role of nondestructive evaluation (NDE) in engineering is explored. Ultrasonic NDE is studied in detail. Labs are used to support the study of ultrasonic NDE. Other NDE techniques are surveyed. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3200. Restricted to MAE students only.

**MAE 4280. Introduction to Finite Element Methods. 3 Credits.**

The application of matrix operations, energy concepts and structural mechanics to the development of the finite element method. Application of finite element method to beams, frames and trusses. Prerequisites: Engineering [ENGINR] 2200 and Mechanical and Aerospace Engineering [MAE] 3100. Restricted to MAE students only.

**MAE 4290. Welding Engineering. 3 Credits.**

Welding is the most common method of joining similar as well as dissimilar materials. This course thus introduces the basic science and engineering aspects of commonly used fusion and non-fusion welding processes. Stress analysis and failure to welded joints is also introduced to develop safe and durable welded structures. Prerequisites: senior standing.

**MAE 4300. Heat Transfer. 3 Credits.**

Fundamentals of conduction, convection and radiation. Use of nondimensional parameters. Theory and design of simple heat exchangers. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400, grade of C or better in Engineering [ENGINR] 2300. Restricted to MAE students only.

**MAE 4310. Intermediate Heat Transfer. 3 Credits.**

Advanced topics in conduction, convection, and radiation. Heat exchanges and their applications will also be analyzed. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300. Restricted to MAE students only.

**MAE 4320. Design of Thermal Systems. 3 Credits.**

Thermal systems are simulated by mathematical models (often on a digital computer), followed by optimization. Supporting topics include: economics, heat transfer, thermodynamics, and optimization. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 4340. Heating and Air Conditioning. 3 Credits.**

General principles of thermal science applied to the design of environmental control systems. Topics covered include heating and cooling load calculations, annual operating and life cycle cost estimating, duct and pipe sizing, and equipment selection. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4300. Restricted to MAE students only.

**MAE 4350. Industrial Energy Analysis. 3 Credits.**

Energy use in industrial systems: furnaces, boilers, compressors, motors, lighting, etc. Insulation in building envelopes. Renewable energy sources. Energy auditing and economic analysis. Graded on A/F basis only. Corequisite: MAE 4300 or instructor's permission.

**MAE 4380. Intermediate Thermodynamics. 3 Credits.**

Topics from classical and statistical thermodynamics. Prerequisite: Engineering [ENGINR] 2300.

**MAE 4390. Aerospace Propulsion. 3 Credits.**

Analysis of aircraft engines and spacecraft propulsion systems. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 4420. Intermediate Fluid Mechanics. 3 Credits.**

Topics in potential and viscous flow theory, and computational fluid dynamics. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 4430. Introduction to Computational Fluid Dynamics and Heat Transfer. 3 Credits.**

Introduction to the principles and development of the finite difference approximations to the governing differential equations of viscous and inviscid fluid flow, as well as heat transfer. Introduction to discretization methods and the calculation of flow fields, convection, diffusion and conduction. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400, 4300 and 4420.

**MAE 4440. Aerodynamics. 3 Credits.**

Presents fundamentals of wing and airfoil theory for incompressible flow, including fluid kinematics and dynamics, potential flow, flow about a body, thin-airfoil theory, and finite wing. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3100 and 3400.

**MAE 4450. Gas Dynamics. 3 Credits.**

One dimensional compressible flow with and without friction and heat transfer. Isentropic flow and shock phenomenon in nozzles and diffusers. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 4500. Manufacturing Methods. 3 Credits.**

Introduction to manufacturing processes with emphasis on those aspects most relevant to methods, problems in force analysis, and practicum and experimentation in machine tool applications. Prerequisite: Engineering [ENGINR] 1110; grade of C or better in Mechanical and Aerospace Engineering [MAE] 3200. Restricted to MAE students only.

**MAE 4520. Manufacturing Process Analysis. 3 Credits.**

Methods and techniques used in process analysis, optimization and control. These include deterministic modeling (slab, upper bound and FEM), physical modeling techniques and statistical process control. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4500.

**MAE 4550. Integrated Production Systems. 3 Credits.**

(same as Industrial and Manufacturing Systems Engineering [IMSE] 4550).

**MAE 4600. Advanced Mechanics of Materials. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4600). Analysis of more complicated problems in stresses, strains. Prerequisite: Engineering [ENGINR] 2200.

**MAE 4620. Aircraft Flight Mechanics. 3 Credits.**

Analysis of aircraft flight dynamics and aircraft performance. Topics include airplane aerodynamics and propulsion, steady flight, flight performance, aircraft maneuvers, aircraft stability, and an introduction to flight controls. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600. Graded on A/F basis only.

**MAE 4630. Space Flight Mechanics. 3 Credits.**

Analysis of spacecraft motion. Topics include orbital dynamics, spacecraft attitude dynamics, satellite trajectory design, and spacecraft control system design. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600. Restricted to MAE students only.

**MAE 4650. Synthesis of Linkages. 3 Credits.**

Type, number and dimensional synthesis of linkages to produce a given input-output motion and/or force. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3100.

**MAE 4660. Vibration Analysis. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 4660). Vibration theory and its application to mechanical systems. Topics include free and forced vibration analysis of single- and multi-degree of freedom systems. Prerequisite: Mechanical and Aerospace Engineering [MAE] 2600 and Mathematics [MATH] 4100.

**MAE 4670. Vehicle Dynamics. 3 Credits.**

Analysis and prediction of the dynamic behavior of ground vehicles utilizing computer simulation. Mechanics of various suspension systems, tire-roadway interaction, vehicle aerodynamics, vehicle handling and steering characteristics. Special topics including nonholonomic constraint formulation and stability of motion. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600.

**MAE 4680. Introduction to MEMS. 3 Credits.**

The course will start with a survey of the widespread applications of MEMS sensors and actuators. Micro fabrication methods used in conventional semiconductor industry will be introduced. MEMS-specific process will be emphasized. Fundamental principles in electric circuits and mechanics will be reviewed. Special attention is on mechanical issues encountered in MEMS design and fabrication.

**MAE 4710. Hydraulic Control System. 3 Credits.**

Analysis of hydraulic control components and systems. Topics include pumps, valves, actuators, and industrial and mobile control systems.



Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400 and 3600. May be repeated for credit. Graded on A/F basis only.

**MAE 4720. Modern Control. 3 Credits.**

Analysis and design of control systems using state-space methods. Topics include controllability and observability, feedback control using pole-placement, state observers, optimal linear-quadratic feedback control, and optimal estimation. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600. Graded on A/F basis only.

**MAE 4730. Mechatronics. 3 Credits.**

Design of systems which require the integration of mechanical and electronic components. Topics include microcontrollers, sensors, actuators, mechanical systems, real time control system programming, and modeling of electronic and mechanical systems. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600.

**MAE 4740. Digital Control. 3 Credits.**

Design and analysis of control systems using discrete-time methods. Topics include z-transforms, sampling and reconstruction, stability analysis, and digital controller design. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600.

**MAE 4750. Classical Control. 3 Credits.**

Study of feedback control design based on classical continuous-time methods. Topics include performance specifications, stability analysis, root locus compensator design, and frequency domain analysis and compensator design. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600.

**MAE 4800. Thermal and Fluid Science Laboratory. 3 Credits.**

Continuation of Mechanical and Aerospace Engineering [MAE] 3800 with emphasis on: instruments to measure temperature, pressure fluid flow, fluid velocity, sound, and computer data acquisition. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300. Restricted to MAE students only.

**MAE 4820. Experimental Methods in Fluid Flow and Heat Transfer. 3 Credits.**

Laboratory experiments involving fundamental mechanisms and phenomena associated with fluid flow and heat transfer. Current experimental methods and techniques employed. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4800 and 4300.

**MAE 4900. Mechanical Design II. 3 Credits.**

Application of the fundamentals of stress analysis of structures and materials science to the design, durability, and selection of machine elements, such as fasteners, springs, shafts, and gears. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3900; grade of C or better in MAE 3200. Restricted to MAE students only.

**MAE 4920. Advanced Computational Design. 3 Credits.**

Development and application of modern simulation-based design methodologies. Topics include structural optimization, multidisciplinary design methods, reliability-based design, non-deterministic methods, design sensitivity analysis, and finite elements in design. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3100. May be repeated for credit. Graded on A/F basis only.

**MAE 4930. Applied Mechanical Optimization. 3 Credits.**

Introduction to mathematical programming techniques and applications to the design of mechanical systems and components. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3100. Restricted to MAE students only.

**MAE 4940. Aircraft Design. 3 Credits.**

Conceptual design of aircraft, from initial sizing and design layout to design analysis, optimization and trade studies. Fundamental theories for aircraft design including sizing, aerodynamic forces, airfoil selection, wing loading, configuration layout payloads, propulsion systems, landing gear, aerospace structures, and cost analysis. Prerequisites: Mechanical and Aerospace Engineering 3400, 3600 and 3900. Graded on A/F basis only.

**MAE 4980. Senior Capstone Design. 3 Credits.**

Senior design experience. Topics include reliability, safety, manufacturability, economic, and environmental constraints; design case studies; and industrial design projects. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600, 4500, 4900; Statistics [STAT] 4710 or Industrial and Manufacturing Systems Engineering [IMSE] 2110. Restricted to MAE students only.

**MAE 4990. Undergraduate Research in Mechanical and Aerospace Engineering. 0-6 Credit.**

Independent investigation or project in Mechanical Engineering. Prerequisites: senior standing in Mechanical Engineering and instructor's consent.

**MAE 4995. Undergraduate Honors Research Mechanical & Aerospace Engineering. 1-99 Credit.**

Independent investigation to be presented as an undergraduate honors thesis. Prerequisite: Honors student in Mechanical and Aerospace Engineering.

**MAE 7001. Topics in Mechanical and Aerospace Engineering. 3 Credits.**

Current and new technical developments in mechanical and aerospace engineering. Prerequisite: graduate standing and instructor's consent.

**MAE 7210. Aerospace Structures. 3 Credits.**

Fundamentals of the mechanics and design issues of aerospace structures. Analysis of thin skins with stiffeners for external surfaces, bulkheads and frames for shape support, and fasteners for holding components together. Prerequisites: grade of C or better in Engineering [ENGINR] 2200. Graded on A/F basis only.

**MAE 7220. Materials Selection. 3 Credits.**

Study of the physical and mechanical metallurgy of alloy systems of interest in engineering applications. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3200.

**MAE 7230. Nanomaterials. 3 Credits.**

The primary goal of this course is to introduce students into the new field of nanostructured materials. The emphasis of the course is to introduce the students into synthesis and characterization of nanomaterials, the behavior of such materials with nanoscale structures, and their technological applications. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200 or equivalent.

**MAE 7231. Transport Phenomena in Materials Processing. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7231) Applications of fluid flow, heat transfer, and mass transfer in steady-state and unsteady-state materials processing with applications to metals, polymers, and ceramics. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200, 3400, 4300 (or equivalent courses) and Mathematics [MATH] 4100. Graded A-F only. Graduate Standing Required.

**MAE 7240. Diffraction Methods in Materials Science. 3 Credits.**

Introduction to crystal structure and the use of x-rays and neutrons to study materials aspects including phase analysis, structure determination,

residual stress and texture. Prerequisite: graduate standing and instructor's consent.

**MAE 7250. Composite Materials. 3 Credits.**

A survey of composite materials used in engineering emphasizing fiber-reinforced composites but including laminate and particulate composites. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3200.

**MAE 7260. Experimental Stress Analysis. 3 Credits.**

The course introduces basic concepts of stress and strain using elasticity theory. Single point and full-field experimental methods for stress and strain measurement, such as strain gages and photoelasticity, are discussed. Application of experimental methods in transducer development and design of structures will be covered. Prerequisites: graduate standing.

**MAE 7270. Nondestructive Evaluation of Materials. 3 Credits.**

The role of nondestructive evaluation (NDE) in engineering is explored. Ultrasonic NDE is studied in detail. Labs are used to support the study of ultrasonic NDE. Other NDE techniques are surveyed. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3200.

**MAE 7280. Introduction to Finite Element Methods. 3 Credits.**

The application of matrix operations, energy concepts and structural mechanics to the development of the finite element method. Application of finite element method to beams, frames and trusses. Prerequisites: graduate standing and Engineering [ENGINR] 2200 and Mechanical and Aerospace Engineering [MAE] 3100.

**MAE 7290. Welding Engineering. 3 Credits.**

Welding is the most common method of joining similar as well as dissimilar materials. This course thus introduces the basic science and engineering aspects of commonly used fusion and non-fusion welding processes. Stress analysis and failure of welded joints is also introduced to develop safe and durable welded structures. Prerequisites: senior standing or graduate level.

**MAE 7310. Intermediate Heat Transfer. 3 Credits.**

Advanced topics in conduction, convection, and radiation. Heat exchanges and their applications will also be analyzed. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 7320. Design of Thermal Systems. 3 Credits.**

Thermal systems are simulated by mathematical models (often on a digital computer), followed by optimization. Supporting topics include: economics, heat transfer, thermodynamics, and optimization. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 7330. Solar Energy Utilization. 3 Credits.**

Thermal aspects of solar radiation applied to human and industrial needs. Solar energy availability: hourly, daily, and seasonally. Space and water heating. Thermal storage. Passive and active solar design of buildings and homes. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 7340. Heating and Air Conditioning. 3 Credits.**

General principles of thermal science applied to the design of environmental control systems. Topics covered include heating and cooling load calculations, annual operating and life cycle cost estimating, duct and pipe sizing, and equipment selection. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 7350. Power Plant System Design. 3 Credits.**

Preliminary component and system design. Optimum design of boilers, steam turbines, condensers and cooling towers and their integration into a system to minimize production costs and impact on the environment. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 7355. Industrial Energy Analysis. 3 Credits.**

Energy use in industrial systems: furnaces, boilers, compressors, motors, lighting, etc. Insulation in building envelopes. Renewable energy sources. Energy auditing and economic analysis. Graded on A-F basis only. Corequisite: MAE 4300 or instructor's consent.

**MAE 7360. Internal Combustion Engines. 3 Credits.**

Gas and oil engines. Thermodynamics of ideal and actual cycles, fuels and combustion, carburetor and injection systems, performance, construction. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 7370. Combustion Fundamentals. 3 Credits.**

Introduction to combustion principles. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 7380. Intermediate Thermodynamics. 3 Credits.**

Topics from classical and statistical thermodynamics. Prerequisite: graduate standing and Engineering [ENGINR] 2300.

**MAE 7390. Aerospace Propulsion. 3 Credits.**

Analysis of aircraft engines and spacecraft propulsion systems. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 7420. Intermediate Fluid Mechanics. 3 Credits.**

Topics in potential and viscous flow theory, and computational fluid dynamics. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 7430. Introduction to Computational Fluid Dynamics and Heat Transfer. 3 Credits.**

Introduction to the principles and development of the finite difference approximations to the governing differential equations of viscous and inviscid fluid flow, as well as heat transfer. Introduction to discretization methods and the calculation of flow fields, convection, diffusion and conduction. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3400, 4300 and 4420.

**MAE 7440. Aerodynamics. 3 Credits.**

Presents fundamentals of wing and airfoil theory for incompressible flow, including fluid kinematics and dynamics, potential flow, flow about a body, thin-airfoil theory, and finite wing. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3100 and 3400.

**MAE 7450. Gas Dynamics. 3 Credits.**

One-dimensional compressible flow with and without friction and heat transfer. Isentropic flow and shock phenomenon in nozzles and diffusers. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 7520. Manufacturing Process Analysis. 3 Credits.**

Methods and techniques used in process analysis, optimization and control. These include deterministic modeling (slab, upper bound and FEM), physical modeling techniques and statistical process control. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 4500.

**MAE 7600. Advanced Mechanics of Materials. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7600). Analysis of more complicated problems in stresses, strains. Prerequisite: graduate standing and grade of C- or better in Engineering [ENGINR] 2200.

**MAE 7610. Experimental Stress Analysis. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7610). Photo elastic, electric strain gage, brittle lacquer methods of experimental stress analysis for static loads. Strain gage work includes strain rosettes. Prerequisite: graduate standing and Engineering [ENGINR] 2200.

**MAE 7620. Aircraft Flight Mechanics. 3 Credits.**

Analysis of aircraft flight dynamics and aircraft performance. Topics include airplane aerodynamics and propulsion, steady flight, flight performance, aircraft maneuvers, aircraft stability, and an introduction to flight controls. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600. Graded on A/F basis only.

**MAE 7630. Space Flight Mechanics. 3 Credits.**

Analysis of spacecraft motion. Topics include orbital dynamics, spacecraft attitude dynamics, satellite trajectory design, and spacecraft control system design. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3600.

**MAE 7640. Analysis of Mechanisms. 3 Credits.**

Kinematics and dynamic (bearing force, shaking force, and time response) design analysis of mechanisms: graphical, analytical and computer assisted techniques. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3100 and 2600.

**MAE 7650. Synthesis of Linkages. 3 Credits.**

Type, number and dimensional synthesis of linkages to produce a given input-output motion and/or force. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3100 and 2600.

**MAE 7660. Vibration Analysis. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 7660). Vibration theory and its application to Mechanical systems. Topics include free and forced vibration analysis of single and multi-degree of freedom systems. Prerequisite: graduate standing and grade of C- or better in Mechanical and Aerospace Engineering [MAE] 2600 and Mathematics [MATH] 4100.

**MAE 7670. Vehicle Dynamics. 3 Credits.**

Analysis and prediction of the dynamic behavior of ground vehicles utilizing computer simulation. Mechanics of various suspension systems, tire-roadway interaction, vehicle aerodynamics, vehicle handling and steering characteristics. Special topics including nonholonomic constraint formulation and stability of motion. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3600.

**MAE 7680. Introduction to MEMS. 3 Credits.**

The course will start with a survey of the widespread applications of MEMS sensors and actuators. Micro fabrication methods used in conventional semiconductor industry will be introduced. MEMS-specific processes will be emphasized. Fundamental principles in electric circuits and mechanics will be reviewed. Special attention is on mechanical issues encountered in MEMS design and fabrication. Graded on A/F basis only.

**MAE 7710. Hydraulic Control Systems. 1-3 Credit.**

Analysis of hydraulic control components and systems. Topics include pumps, valves, actuators, and industrial and mobile control systems. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 3400 and 3600.

**MAE 7720. Modern Control. 3 Credits.**

Analysis and design of control systems using state-space methods. Topics include controllability and observability, feedback control using pole-placement, state observers, optimal linear-quadratic feedback control, and optimal estimation. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3600. Graded on A/F basis only.

**MAE 7730. Mechatronics. 3 Credits.**

Design of systems which require the integration of mechanical and electronic components. Topics include microcontrollers, sensors, actuators, mechanical systems, real time control system programming, and modeling of electronic and mechanical systems. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600; graduate standing required.

**MAE 7740. Digital Control. 3 Credits.**

Design and analysis of control systems using discrete-time methods. Topics include Z-transformation, sampling and reconstruction, stability analysis, and digital controller design. Prerequisites: MAE 3600.

**MAE 7750. Classical Control. 3 Credits.**

Study of feedback control design based on classical continuous-time methods. Topics include performance specifications, stability analysis, root locus compensator design, and frequency domain analysis and compensator design. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600; graduate standing required.

**MAE 7820. Experimental Methods in Fluid Flow and Heat Transfer. 3 Credits.**

Laboratory experiments involving fundamental mechanisms and phenomena associated with fluid flow and heat transfer. Current experimental methods and techniques employed. Prerequisites: graduate standing and Mechanical and Aerospace Engineering [MAE] 4300 and 4800.

**MAE 7920. Advanced Computer Design. 3 Credits.**

Development and application of modern simulation-based design methodologies. Topics include structural optimization, multidisciplinary design methods, reliability-based design, non-deterministic methods, design sensitivity analysis, and finite elements in design. Prerequisite: Mechanical and Aerospace Engineering [MAE] 3100. Graded on A/F basis only. May be repeated for credit.

**MAE 7930. Applied Mechanical Optimization. 3 Credits.**

Introduction to mathematical programming techniques and applications to the design of mechanical systems and components. Prerequisite: graduate standing and Mechanical and Aerospace Engineering [MAE] 3100.

**MAE 7940. Aircraft Design. 3 Credits.**

Conceptual design of aircraft, from initial sizing and design layout to design analysis, optimization, and trade studies. Fundamental theories for aircraft design, including sizing, aerodynamic forces, airfoil selection, wing loading, configuration layout, payloads, propulsion systems, landing gear, aerospace structures, and cost analysis. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400, 3600, 3900. Graded A-F only. Graduate Standing Required.

**MAE 8001. Advanced Topics in Mechanical and Aerospace Engineering. 3 Credits.**

Advanced Topics in Mechanical and Aerospace Engineering.

**MAE 8085. Problems in Mechanical and Aerospace Engineering. 1-99 Credit.**

Supervised investigation in mechanical and aerospace engineering to be presented in the form of a report.

**MAE 8087. Graduate Seminar in Mechanical and Aerospace Engineering. 1 Credit.**

Reviews recent investigations, projects of major importance in mechanical and aerospace engineering. Graded on S/U basis only.

**MAE 8210. Physical Metallurgy. 3 Credits.**

Treatment of fundamentals of physical metallurgy, including metallurgical thermodynamics, macroscopic and atomic diffusion, interfaces, nucleation, solidification theory, and solid state transformations.

Prerequisite: Mechanical and Aerospace Engineering [MAE] 3200.

**MAE 8220. Fracture Mechanics. 3 Credits.**

Mechanics of flawed structure. Concepts include Griffith theory, Barenblatt's theory, Irwin analysis, energy analysis of cracked bodies, fracture toughness testing, plane strain, plane stress, transition temperature concepts, subcritical flaw growth. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3200 or instructor's consent.

**MAE 8230. Advanced Ceramic Materials. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] and Biological Engineering [BIOL\_EN] 8230). To provide an advanced level understanding between processing, properties, and microstructure of ceramic materials.

Topics include crystallography, defect chemistry, transport properties, microstructure, and forming methods. Graded on A/F basis only.

**MAE 8270. Aeroelasticity. 3 Credits.**

Deformations of aerospace structures under static and dynamic loads, natural mode shapes and frequencies, aerodynamic and inertial loads, flutter analysis, dynamic response phenomena, and critical speeds and frequencies. Prerequisites: instructor's consent.

**MAE 8280. Finite Element Methods. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8208). The concepts and fundamentals of the finite element method with applications to problems in solid and fluid mechanics. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4280.

**MAE 8300. Microscale Heat Transfer. 3 Credits.**

Review of existing models. Concept of thermal lagging and the second-law admissibility. Applications to low temperatures, thermal processing of thin-film devices; amorphous materials; advanced composites.

Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 8310. Thermal Management in Electronic Systems. 3 Credits.**

Advanced heat transfer course focusing on the problems of cooling electronic systems such as microprocessors and other electronic devices where thermal management is needed. The advanced cooling technologies are introduced. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300. Graded on A/F basis only.

**MAE 8311. Heat Transfer-Convection. 3 Credits.**

Principles of heat transfer by convection, review of boundary layer theory, laminar and turbulent heat transfer, temperature-dependent fluid properties, high velocity heat transfer and an introduction to mass transfer. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4300 and 8410.

**MAE 8312. Heat Transfer-Radiation. 3 Credits.**

Advanced study of engineering radiation heat transfer. Concepts of electromagnetic theory. Development of thermal radiation laws from thermodynamic laws. Analysis of grey and non-grey systems with

intervening gases. Study of recent literature. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 8315. Multiphase Heat Transfer. 3 Credits.**

Fundamentals and application of heat and mass transfer and fluid flow with phase change; melting and solidification, sublimation and vapor deposition, condensation, evaporation, nucleate and film boiling, two-phase flow. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300. Graded on A/F basis only.

**MAE 8320. Continuum Mechanics. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8320). Introductory course in the mechanics of continuous media. Basic concepts of stress, strain, constitutive relationships; conservation laws are treated using Cartesian tensor notation. Examples from both solid and fluid mechanics investigated. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400, Mathematics [MATH] 4100, Engineering [ENGINR] 2200.

**MAE 8330. Theory of Elasticity. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8330). Stress and strain at a point. General equations of elasticity. Plane stress, plain strain problems; torsion of prismatic bars. Energy methods.

**MAE 8340. Theory of Plates and Shells. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8340). Rectangular and circular plates. Variational methods in the analysis of plates and shells. Plates of unusual shape. Shear deformation effects. Large deformation analysis. Analysis of cylindrical shells.

**MAE 8350. Theory of Elastic Stability. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8350). Buckling of Columns, frames, arches and other structural systems. Kinematic approach to stability. Large deflections. Energy approach to buckling. Plate and shell buckling. Inelastic buckling of columns. Creep buckling.

**MAE 8360. Theory of Plasticity. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8360). Plastic yield conditions and stress-strain relations. Behavior of elastic-perfectly plastic members. Plain strain in plastic members. Prerequisites: Mechanical and Aerospace Engineering [MAE] 8330 or instructor's consent.

**MAE 8370. Advanced Combustion. 3 Credits.**

Numerical modeling of combustion systems and advanced diagnostic techniques. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4370.

**MAE 8380. Advanced Thermodynamics. 3 Credits.**

Advanced topics from classical thermodynamics. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4380.

**MAE 8385. Heat Transfer-Conduction. 3 Credits.**

Distribution of temperature and temperature history within solids by the four essential methods of evaluation of these temperature fields. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 8390. Statistical Thermodynamics. 3 Credits.**

Statistical methods of evaluating thermodynamic properties. Elements of quantum mechanics, statistical mechanics and kinetic theory applied to topics of engineering thermodynamics. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4380 and Statistics [STAT] 4710.

**MAE 8392. Dynamics of Structures. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8392). Study of the dynamic behavior of structures. Analysis of equivalent lumped parameter systems for the design of structures in a dynamic environment. Prerequisites:

Civil Engineering [CV\_ENG] 8390 or equivalent, Proficiency in Digital Computer Programming, or instructor's consent.

**MAE 8410. Boundary Layer Theory. 3 Credits.**

Fluid motion at high Reynolds Number. Derivation of Navier-Stokes equations and boundary layer equations. Methods of solution. Transition to turbulent flow. Completely developed turbulent flow. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4420.

**MAE 8420. Computational Heat Transfer and Fluid Dynamics. 3 Credits.**

Introduction to numeric analysis techniques applied to heat transfer and fluid dynamics problems. Coverage will include, the development of discretization equations for the control volume approach and solution strategies of those equations. Results from numeric simulations will be compared with close form analytic solutions and commercial numeric code output.

**MAE 8430. Introduction to Two Phase Flow. 3 Credits.**

An introduction to the analysis of the mechanics and transport processes in two phase flows. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3400.

**MAE 8440. Physical Gas Dynamics. 3 Credits.**

Study of the flow of chemically reacting gases of interest in mechanical and aerospace engineering. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4300.

**MAE 8450. Introduction to Turbulence. 3 Credits.**

An introduction to the physical phenomena of turbulence, supported by mathematical and statistical descriptions. Especially appropriate for engineers involved in research of momentum, heat, and mass transport. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4420.

**MAE 8510. Manufacturing Design. 3 Credits.**

Design for manufacture methods, their capabilities and applications. Design of intelligent manufacturing systems using sensory systems and artificial intelligence techniques. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3100 and 4500.

**MAE 8520. Computer Integrated Manufacturing. 3 Credits.**

Modeling and simulation of manufacturing processes and advanced computer applications in manufacturing systems and machining processes, NC-programming. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4500 and 4700.

**MAE 8620. Advanced Dynamics. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8620). Fundamental principles of advanced rigid body dynamics with applications. Special mathematical techniques including Lagrangian and Hamiltonian methods. Prerequisites: Mechanical and Aerospace Engineering [MAE] 2600.

**MAE 8630. Vibrations of Distributed Parameter Systems. 3 Credits.**

(same as Civil Engineering [CV\_ENG] 8630). Vibration analysis of strings, cables, bars, rods, shafts, beams, membranes, plates, circular rings, frames; free and forced oscillation; miscellaneous loading; various boundary conditions; effect of damping; energy methods; method of difference equations. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4660.

**MAE 8660. Advanced Vibration Analysis. 3 Credits.**

Advanced topics in vibration theory and its application to Mechanical Systems. Topics include vibration analysis of multi-degree of freedom, distributed and nonlinear systems, random vibration analysis, and vibration control. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4660 or instructor's consent.

**MAE 8670. Advanced Vehicle Dynamics. 3 Credits.**

Applications of advanced dynamics, sensitivity analysis, and stability methods to analysis of complex vehicle dynamic systems. Modeling of pneumatic tire behavior, development and experimental validation of advanced vehicle computer simulations. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4670.

**MAE 8740. Robust Control. 3 Credits.**

Definition of the robust performance problem with the goal of achieving specified signal levels in the face of plant uncertainty; uncertainty and robustness, stabilization, design constraints, loopshaping, model matching and design for robust performance. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4700, and 8780 or instructor's consent.

**MAE 8750. Nonlinear Control. 3 Credits.**

Nonlinear systems analysis techniques including phase plane analysis, Lyapunov theory. Control design including feedback linearization, sliding control, and adaptive control. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4700 and 8780.

**MAE 8780. State Variable Methods in Automatic Control. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 8780, Electrical and Computer Engineering [ECE] 8780, Nuclear Engineering [NU\_ENG] 8408). State variables for continuous and discrete-time dynamic control systems; controllability and observability; optimal control of linear systems. Prerequisites: Mechanical and Aerospace Engineering [MAE] 4700.

**MAE 8910. Modular Machine Tool Design. 3 Credits.**

This course introduces necessary concepts and tools for modular machine tool design. Students will learn how to apply mechanical design knowledge and commercially available subassemblies and parts to design modular machine tools for mass production application. Prerequisite: Mechanical and Aerospace Engineering [MAE] 4980 or instructor's consent.

**MAE 8920. Reliability-Based Design of Engineering Systems. 3 Credits.**

Introduction to the methods that identify the ability of a system to perform its required functions for a specified period of time. Topics include failure mode and effects analysis, reliability prediction, Weibull distribution analysis, reliability testing, and accelerated life testing. Prerequisite: Graduate standing in Engineering.

**MAE 8930. Advanced Mechanical System Modeling and Optimization. 3 Credits.**

Calculus of variations is introduced as a basic tool. Hamilton's Principle is used for system modeling. Numerical solution methods are used for dynamic simulation. Genetic algorithm and other algorithms are applied for system optimization. Prerequisites: Mechanical and Aerospace Engineering [MAE] 3600 and 4980. Seniors will require consent. Graded on A/F basis only.

**MAE 8990. Research-Masters Thesis in Mechanical and Aerospace Engineering. 1-99 Credit.**

Independent investigation in field of mechanical and aerospace engineering to be presented as a thesis. Graded on a S/U basis only.

**MAE 9990. Research-Doctoral Dissertation Mechanical & Aerospace Engineering. 1-99 Credit.**

Independent investigation in field of mechanical and aerospace engineering to be presented as a thesis. Graded on a S/U basis only.

## Medical Pharmacology and Physiology (MPP)

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### **MPP 2010. The Science of Sex, Drugs and Rock'n'Roll. 1 Credit.**

This course will examine the data and theories for how drugs affect the body, for the physiology of reproduction and, for how sound affects the body. These topics will be used to motivate an understanding, and provide training in applying, the key scientific principles. Graded on A/F basis only.

### **MPP 3202. Elements of Physiology. 5 Credits.**

Beginning course for sophomore and above designed to cover the basic functional aspects of major organ systems of the body. Prerequisite: sophomore standing.

### **MPP 3290. Undergraduate Research. 1-3 Credit.**

Laboratory experience and opportunity to explore research in medical pharmacology and physiology.

### **MPP 3333. Fundamentals of Human Physiology. 3 Credits.**

This course presents the basic concepts of physiology using a problem based approach. The major organs systems are discussed with the relevance to everyday physiology as well as clinical and animal applications discussed.

### **MPP 3337. Human Physiology Laboratory. 2 Credits.**

This lab course will involve experiments to illustrate basic physiology concepts.

### **MPP 4001. Undergraduate Topics in Medical Pharmacology and Physiology. 1-3 Credit.**

Selected topics not in regularly offered courses. Prerequisite: instructor's consent.

### **MPP 4085. Undergraduate Problems in Medical Pharmacology and Physiology. 1-3 Credit.**

This course is designed to provide well-qualified undergraduate students the opportunity to engage in advanced study in topics in pharmacology or physiology with individual faculty members. Topics will be drawn from recent primary literature. Graded on A/F basis only. Prerequisites: instructor's consent.

### **MPP 4202. Medical Physiology. 4 Credits.**

Medical Physiology is intended for health scientists. Fat, bone, digestion, nutrition, appetite and brain health will be emphasized for health reform and updates for nervous, muscle, heart, vasculature, liver, renal, lung and endocrine systems with analysis for preventative medicine. Graded on A-F only. May be repeated for credit. Prerequisite: Nutrition or Biochemistry.

### **MPP 4204. Medical Pharmacology. 5 Credits.**

Medical pharmacology teaches the science of drug actions in medicine today, and principles of pharmacokinetics/dynamics. Future health professionals will learn prescription judgment and quality/cost improvements for patient safety. An online laboratory will teach drug database information technology. Prerequisites: Biological Science [BIO\_SC] 3700 or Medical Pharmacology and Physiology [MPP] 3202.

### **MPP 4204H. Medical Pharmacology-Honors. 0 Credits.**

Medical pharmacology teaches the science of drug actions in medicine today, and principles of pharmacokinetics/dynamics. Future health professionals will learn prescription judgment and quality/cost improvements for patient safety. An online laboratory will teach drug

database information technology. Prerequisites: BIO\_SC 3700 or MPP 3202. Honors eligibility required.

### **MPP 4310. Mammalian Cell Function. 3 Credits.**

An overview of the structure and function of mammalian cells including topics in membrane physiology and transport, cell signaling, compartmentalization and metabolism, cell proliferation and differentiation and the structure and function of certain specialized cells (e.g. muscle cells, epithelial cells and neurons). Laboratory and/or discussion sessions will be included as part of the course with laboratory topics to be determined. We will devote approximately 75% of the lecture to generalized cell functions, and 25% to deal with topics concerning specialized cells. Graded on A/F basis only. Prerequisite: instructor's consent. For graduate credit, students will be required to participate in laboratory exercises.

### **MPP 6271. ABS Pharmacology Mechanism of Disease. 5-10 Credit.** ABS Pharmacology Mechanism of Disease.

### **MPP 6273. ABS Pharmacology Research. 5-10 Credit.** ABS Pharmacology Research.

### **MPP 6275. ABS Pharmacology Research and Review. 5 Credits.** ABS Pharmacology Research and Review.

### **MPP 6281. ABS Physiology Mechanism of Disease. 5-10 Credit.** ABS Physiology Mechanism of Disease.

### **MPP 6283. ABS Physiology Research. 5-10 Credit.** ABS Physiology Research.

### **MPP 6285. ABS Problem Solving in Pharmacology and Physiology. 5-10 Credit.** ABS Problem Solving in Pharmacology and Physiology.

### **MPP 6525. Pharmacology. 5 Credits.** Pharmacology.

### **MPP 6535. Ion Transport Changes During Hypertension. 5 Credits.** Ion Transport Changes During Hypertension.

### **MPP 6537. Control of Myocardial Energy Production. 5 Credits.** Control of Myocardial Energy Production.

### **MPP 7300. Physics in Cell and Developmental Biology. 3 Credits.** (same as Physics [PHYSICS] and Biological Sciences [BIO\_SC] 7310). Introduction to physical mechanisms and their modeling in cellular processes and development. Prerequisite: instructor's consent.

### **MPP 7302. Drug Discovery and Design. 1 Credit.** Crosslisted with General Honors [GN\_HON] 1030H.

### **MPP 7310. Mammalian Cell Function. 3-5 Credit.** An integrated course covering the structure and function of mammalian cells as relevant to clinical translational research including topics in membrane physiology and transport, cell signaling, cell proliferation, differentiation, compartmentalization and metabolism. Graded on A/F basis only. Prerequisite: instructor's consent.

### **MPP 7422. Medical Physiology. 4 Credits.** Medical Physiology is intended for health scientist. Fat, bone, digestion, nutrition, appetite and brain health will be emphasized for health reform and updates for nervous, muscle, heart, vasculature, liver, renal, lung and endocrine systems with analysis for preventive medicine. May be repeated for credit. Graded on A-F basis only. Prerequisites: Nutrition or Biochemistry.

**MPP 7424. Pharmacology and Translational Medicine. 5 Credits.**

Pharmacology teaches the science of drug actions in medicine today and principles of pharmacokinetics/dynamics. Future medical researchers will learn molecular probes for medical research and translational science to improve health care. An online laboratory will teach drug database information technology. Prerequisites: Biological Sciences [BIO\_SC] 3700 or Medical Pharmacology and Physiology [MPP] 3202. Graded on A-F only basis.

**MPP 8001. Graduate Topics in Medical Pharmacology and Physiology. 1-3 Credit.**

Prerequisite: instructor's consent.

**MPP 8050. Non-Thesis Research in Medical Pharmacology and Physiology. 1-5 Credit.**

Opportunities for graduate research in physiology or pharmacology not leading to dissertation. Graded on A/F basis only. Prerequisite: instructor's consent.

**MPP 8085. Graduate Problems in Medical Pharmacology and Physiology. 1-3 Credit.**

Guided study to strengthen knowledge in physiology and pharmacology. Graded on A/F basis only. Prerequisite: instructor's consent.

**MPP 8090. Thesis Research in Medical Pharmacology and Physiology. 1-99 Credit.**

Research in physiology or pharmacology, leading to dissertation. Graded on a S/U basis only. Prerequisite: instructor's consent.

**MPP 8410. Neural Control. 1 Credit.**

An integrated course covering the physiology and pharmacology of the autonomic nervous system and the central nervous system. Graded on A/F basis only. Prerequisite: instructor's consent.

**MPP 8411. Mammalian Pharmacology and Physiology. 5 Credits.**

An integrated course covering the basic concepts in physiology and pharmacology of the cardiovascular, gastrointestinal, endocrine, renal, and respiratory systems with an emphasis of applying the key concepts to clinically relevant examples. Graded on A/F basis only. Prerequisite: instructor's consent.

**MPP 8412. Seminar in Medical Pharmacology and Physiology. 1 Credit.**

Instruction in critical evaluation, review, and summary of scientific data and practice in oral presentation of scientific research seminar. Taught in conjunction with weekly department seminar series.

**MPP 8415. Ethics Education by Engagement, Entactment & Empowerment. 2 Credits.**

The emphasis is on the scientific research ethics problems in interdisciplinary work. Student involvement can include designing mock misconduct trials or writing advocacy letters to change current policy. Prerequisites: graduate standing required. Consent of instructor required.

**MPP 8417. Scientific Communication. 2 Credits.**

A course to foster and improve students ability to communicate orally and in writing. Student enrolled in the course will be expected to write a report and present a seminar on a topic related to one of the lab rotation projects to the mentor of the rotation and other interested faculty members and students. Graded on A/F basis only. Prerequisite: instructor's consent.

**MPP 8420. Skills in Biomedical Research. 2 Credits.**

This course focuses on introducing graduate students to the basics of biomedical research. Course objectives are to provide new graduate students with a basic understanding of laboratory safety issues and

fundamental skills that are integral to research including principles of experimental design, theory and practical application of modern research techniques, written and oral communication of research information, and scientific record keeping standards. Prerequisites: Graduate standing required. Graded on S/U basis only.

**MPP 9090. Thesis Research in Medical Pharmacology and Physiology. 1-99 Credit.**

Research in physiology or pharmacology, leading to dissertation. Graded on a S/U basis only. Prerequisite: instructor's consent.

**MPP 9421. Neural Pharmacology. 1-3 Credit.**

Biochemical and behavioral actions of drugs affecting the nervous system. Effects of drugs on synaptic mechanism including neurotransmitter metabolism and receptor interactions. Graded on A/F basis only. Prerequisite: instructor's consent.

**MPP 9422. Medical Pharmacology and Physiology Journal Club. 1 Credit.**

On a weekly basis, individual students are assigned current high profile journal articles to present to their fellow students and faculty in a journal club setting. Each student in the course is required to read the paper in advance and participate in discussions of the figures and general topics that is being presented. Prerequisite: enrolled in MPP PhD graduate program. Graded on S/U basis only.

**MPP 9423. Oncological Pharmacology. 1-3 Credit.**

An in-depth study of the causes and treatments of cancers including discussions of mutagenesis and carcinogenesis, principles of cancer chemotherapy and recent developments with targeted therapeutics. The basis for genetic differences in cancer drug responsiveness including genetics predisposition's to disease and drug toxicity (pharmacogenetics) and genetic polymorphism's associated with disease susceptibility, adverse drug responses and drug resistance (pharmacogenomics) will also be discussed. Prerequisite: Medical Pharmacology and Physiology [MMP] 8411.

**MPP 9425. Receptor Pharmacology. 1-2 Credit.**

The goal of this course is to facilitate the student's efforts to obtain a solid working knowledge of receptor pharmacology, physiology and molecular biology that can be of benefit in the future. The course will explore a variety of receptor issues, primarily in a discussion format organized by the faculty members involved in the course. The course is divided into two related components. The first component will cover general principles of quantifying ligand - receptor interactions and subsequent responses, summarize some of the methods of receptor identification and characterization and evaluate the various schemes of receptor typing and subtyping. The second component will explore specific characteristics of receptors from some of the major receptor families with an emphasis on understanding mechanisms of receptor activation and regulation as well as exploring concepts about the structural basis for discrete receptor functions. A typical list of receptors to be covered in the course may include the tyrosine kinase receptors, G protein-coupled receptors, cytokine receptors, ligand activated transcription factors (nuclear receptors), adhesion receptors such as integrins, and ligand activated ion channels.

**MPP 9426. Transmembrane Signaling. 4 Credits.**

This course is for advanced level graduate students. The course is designed to develop state of the art knowledge and understanding of current research issues in the cell signaling. The major emphasis is on receptor and non-receptor mediated transmembrane signaling events underlying physiological and pharmacological responses of the cells.

Students are also involved in class presentations, and the development and critical review of new research proposals, all focused on cellular signaling. Prerequisite: basic courses in biochemistry and or cell and molecular biology or equivalent.

**MPP 9427. Drug Metabolism. 1-3 Credit.**

(same as Veterinary Biomedical Science [V\_BSCI] 9427). The course is concerned with the absorption, distribution, metabolism and elimination of drugs using a comparative approach. The pharmacokinetic aspects of elimination are stressed.

**MPP 9428. Clinical Biodetection. 2 Credits.**

Interdisciplinary approach to clinical translational applications of physiology and pharmacology and related life, physical, chemical, and engineering sciences. Graduate standing required. Consent of instructor required.

**MPP 9429. Principles and Frontiers of Molecular Pharmacology. 5 Credits.**

An in-depth examination of pharmacodynamics, structure-activity relationships, pharmacokinetics/drug metabolism, and toxicology, followed by a consideration of emerging concepts regarding membrane receptors and channels and their role in biology and medicine. Prerequisites: graduate standing required. Students must have completed a physiology, biochemistry or cell biology course.

**MPP 9430. Cardiovascular Physiology. 3 Credits.**

This course is designed to provide the student with an in depth knowledge of specific aspects of cardiovascular physiology with major emphasis on cardiac structure and function. Topics are covered in 1, 3-4 hour session per week and are based on reading assignments from the literature. The following topics have been addressed in previous offerings but the specific topics may vary from year to year: Heart muscle structure related to function; Contractile proteins structures and function; Regulation of protein synthesis; Regulation of myocardial hypertrophy; Regulation of myocardial metabolism; Myocardial mechanics systolic and diastolic function; Mechanisms of length dependent contraction; Control of electrical-mechanical coupling processes; Mechanisms for adrenergic regulation of myocardial function. Prerequisites: Medical Pharmacology and Physiology [MMP] 4310 and 8411 or the equivalent (e.g., UM first year medical school curriculum, Veterinary Biomedical Science [V\_BSCI] 8421, or Biological Sciences [BIO\_SC] 3700 with supporting courses).

**MPP 9431. Control of Energy Metabolism. 3 Credits.**

(same as Veterinary Biomedical Science [V\_BSCI] 9431). This advanced elective is in a lecture/discussion format using primary literature to explore how cells organize and regulate metabolism to meet energy demands. Prerequisite: instructor's consent.

**MPP 9432. Mammalian Membrane Physiology. 1-3 Credit.**

This course is designed to stimulate active learning of the concepts of modern membrane physiology. Throughout the course, a balance will be maintained between examining classic papers in the field and current literature, including not only theories that have held up over time, but areas in which there is current dispute as the best model that describes the observations.

**MPP 9434. Microvascular Circulatory Function. 4 Credits.**

(same as Veterinary Biomedical Sciences [V\_BSCI] 8370.) An in-depth study of microcirculatory structure and function in various tissues with emphasis on recent developments in the understanding of the mechanisms involved in nutrient supply, edema formation, lymphatic function and fluid balance. Prerequisite: Veterinary Biomedical Science [V\_BSCI] 8420 and 8421 or equivalent and instructor's consent.

**MPP 9435. Skeletal Muscle. 1-3 Credit.**

(same as Veterinary Biomedical Sciences [V\_BSCI] 9435). Skeletal muscle mechanics, contractions theories, transgenic models, development, gene expression regulation, adaptation to exercise, aging, metabolic functions, and inactivity induced chronic diseases. Prerequisite: course director's consent required for enrollment.

**MPP 9436. Renal Physiology. 1-3 Credit.**

Mechanisms in mammalian renal physiology presented with particular emphasis on current techniques and concepts. Prerequisites: Veterinary Biomedical Science [V\_BSCI] 8420 and 8421 or equivalent and instructor's consent.

**MPP 9437. Neural Control of the Circulation. 1-3 Credit.**

(same as Veterinary Biomedical Science [V\_BSCI] 9467). Course objectives include developing a general understanding of CNS mechanisms in the regulation of the cardiovascular system, including autonomic, neurohumoral and body fluid homeostatic mechanisms, gaining knowledge of the major advances and topics in the field and becoming familiar with some of the methods used to study CNS cardiovascular regulation. Graded on A/F basis only. Prerequisites: instructor's consent.

## Medicine-Interdisciplinary (MED\_ID)

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**MED\_ID 5041. Structure and Function of the Human Body I. 6 Credits.**

Biochemical principles, cell biology, human development, histology and gross anatomy with clinical correlates utilizing patient examples and non-invasive techniques.

**MED\_ID 5042. Interviewing. 3 Credits.**

Development of skills needed to obtain a history of the patient's present illness, past medical history and other pertinent background information. Vitally important to medical practice, these skills are role modeled, practiced and evaluate with detailed feedback. Additional emphasis is placed on the doctor-patient relationship, ethics and the role of the physician as a therapeutic agent.

**MED\_ID 5043. Structure and Function of the Human Body II. 6 Credits.**

Study of the structure and function of the body's metabolic, nervous and muscular systems.

**MED\_ID 5044. Physical Examination. 3 Credits.**

Introduction to the doctor-patient relationship and systematic physical examination of the patient. Certification in basic life support is also included.

**MED\_ID 5045. Structure and Function of the Human Body III. 6 Credits.**

Study of the structure and function of the body's cardiovascular, gastrointestinal, and urinary systems.

**MED\_ID 5046. Psychosocial Aspects of Medicine. 3 Credits.**

A brief study of the history of medicine and the impact of key events on current medical practice. Study of the biopsychosocial model, biomedical ethics and specific psychosocial problems encountered by physicians such as compliance, problems based in human sexuality, substance abuse and death and dying.



**MED\_ID 5047. Structure and Functions of the Human Body IV. 6 Credits.**

Study of the structure and function of the endocrine, reproductive, vascular systems. The classification of pathogenic and non-pathogenic organisms, mechanisms of infection, the immune response and the interaction between pharmacologic agents and exogenous organisms.

**MED\_ID 5048. Clinical Epidemiology and Preventive Medicine. 3 Credits.**

Application of clinical epidemiology to understanding measurement of population characteristics and to the critical analysis of the literature through analysis of study designs and interpretation of the results and causal relationships. Study of prevention, screening and health maintenance as important aspects of health care.

**MED\_ID 5051. Ambulatory Clinical Experience 1. 1 Credit.**  
Ambulatory Clinical Experience 1.

**MED\_ID 5052. Ambulatory Clinical Experience 2. 1 Credit.**  
Ambulatory Clinical Experience 2.

**MED\_ID 5053. Ambulatory Clinical Experience 3. 1 Credit.**  
Ambulatory Clinical Experience 3.

**MED\_ID 5054. Ambulatory Clinical Experience 4. 1 Credit.**  
Ambulatory Clinical Experience 4.

**MED\_ID 5180. FULL-TIME ENROLLMENT FOR POST-SOPHOMORE FELLOWS. 18 Credits.**  
FULL-TIME ENROLLMENT FOR POST-SOPHOMORE FELLOWS.

**MED\_ID 5201. Summer Clinical Practicum Family Medicine. 0 Credits.**  
Summer Clinical Practicum Family Medicine.

**MED\_ID 5205. Individualized Study. 1-5 Credit.**  
Individualized Study.

**MED\_ID 5207. Summer Clinical Practicum Internal Medicine. 0 Credits.**  
Summer Clinical Practicum Internal Medicine. 4 week course. Zero credit hours, 4 FA hours.

**MED\_ID 5209. Summer Clinical Fellowship. 0 Credits.**  
Summer Clinical Fellowship.

**MED\_ID 5213. Leadership Practicum. 0 Credits.**  
Leadership Practicum.

**MED\_ID 5215. Summer Clinical Practicum - Medical Education. 0 Credits.**  
Summer Clinical Practicum - Medical Education- Zero billing hours and 4 FA hours.

**MED\_ID 5217. Summer Clinical Practicum - Rural Track. 0 Credits.**  
This represents non-credit clinical and research experiences that medical students may take during the summer following their first (M1) year of medical school. 8 weeks. Zero Credit.

**MED\_ID 5253. Post-Sophomore Fellowship. 3 Credits.**  
Post-Sophomore Fellowship.

**MED\_ID 5341. Structure/Function Human Body I - Remediation. 6 Credits.**  
Structure/Function Human Body I - Remediation.

**MED\_ID 5342. Interviewing - Remediation. 3 Credits.**  
Interviewing - Remediation.

**MED\_ID 5343. Structure/Function Human Body II - Remediation. 6 Credits.**  
Structure/Function Human Body II - Remediation.

**MED\_ID 5344. Physical Exam - Remediation. 3 Credits.**  
Physical Exam - Remediation.

**MED\_ID 5345. Structure/Function Human Body III. 6 Credits.**  
Structure/Function Human Body III.

**MED\_ID 5346. Psychosocial Aspects Med - Remediation. 3 Credits.**  
Psychosocial Aspects Med - Remediation.

**MED\_ID 5347. Structure/Function Human Body IV - Remediation. 6 Credits.**  
Structure/Function Human Body IV - Remediation.

**MED\_ID 5348. Clinical Epidemiology and Preventive Medicine - Remediation. 3 Credits.**  
Clinical Epidemiology and Preventive Medicine - Remediation.

**MED\_ID 5351. Ambulatory Clinical Experience 1- Remediation. 1 Credit.**  
Ambulatory Clinical Experience 1- Remediation.

**MED\_ID 5352. Ambulatory Clinical Experience 2- Remediation. 1 Credit.**  
Ambulatory Clinical Experience 2- Remediation.

**MED\_ID 5353. Ambulatory Clinical Experience 3-Remediation. 1 Credit.**  
Ambulatory Clinical Experience 3-Remediation.

**MED\_ID 5354. Ambulatory Clinical Experience 4- Remediation. 1 Credit.**  
Ambulatory Clinical Experience 4- Remediation.

**MED\_ID 5551. Pathophysiology I. 6 Credits.**  
Pathophysiologic mechanisms of cell injury, inflammation and repair, hemodynamic disturbances, genetic disorders, autoimmune response, immune deficiency and hypersensitivity reactions.

**MED\_ID 5552. Diagnostic Tests and Medical Decisions. 3 Credits.**  
Assessment of the appropriate use and interpretation of common diagnostic tests and their contribution to medical decisions and the care of patients. Includes emphasis on the review of systems, interactive hypothesis testing, differential diagnosis probability, sensitivity and specificity, and cost benefit and cost effectiveness analysis.

**MED\_ID 5553. Pathophysiology II. 6 Credits.**  
Pathophysiologic mechanisms of cardiovascular disease, diseases of the respiratory system, disorders of the blood, and nutritional diseases.

**MED\_ID 5554. Psychopathology and Behavioral Medicine. 3 Credits.**  
Presentation and discussion of the U.S. health care system and health care reform, financing and resource allocation, and the impact of change on individuals, communities, employers and the government. Included are analyses of the ethical and legal implications of health care and health care reform.

**MED\_ID 5555. Pathophysiology III. 6 Credits.**  
Pathophysiologic mechanisms of the digestive, endocrine and urogenital systems.

**MED\_ID 5556. Clinical Practicum. 3 Credits.**  
A continuation of Block 6 objectives and a clinical practicum and review comprise this block.

**MED\_ID 5557. Pathophysiology IV. 6 Credits.**

Pathophysiology of infectious diseases, reproductive disorders, musculoskeletal and soft tissues diseases, diseases affecting the nervous system and skin diseases.

**MED\_ID 5558. Physician as a Person. 3 Credits.**

Exploration of the physician as a person, the balance between professional and personal demands, family life, membership in a community, the stresses and rewards of the medical profession, professional ethics and the doctor-patient relationship. A four week clinical review completes this block.

**MED\_ID 5561. Advanced Physical Diagnosis 1. 1 Credit.**

Advanced Physical Diagnosis 1.

**MED\_ID 5562. Advanced Physical Diagnosis 2. 1 Credit.**

Advanced Physical Diagnosis 2.

**MED\_ID 5563. Advanced Physical Diagnosis 3. 1 Credit.**

Advanced Physical Diagnosis 3.

**MED\_ID 5564. Advanced Physical Diagnosis 4. 1 Credit.**

Advanced Physical Diagnosis 4.

**MED\_ID 5570. Advanced Clinical Skill Practicum. 0 Credits.**

This course is designed for MD/PhD students and other medical students away on research or post-sophomore fellowship leave. Approval to enroll must be obtained from the Director of the MD/PhD program or the Faculty Director of Clinical curriculum. Graded on S/U basis only. Prerequisite: Advanced Physical Diagnosis; must have satisfactorily completed the second year of medical school.

**MED\_ID 5751. Pathophysiology I - Remediation. 6 Credits.**

Pathophysiology I - Remediation.

**MED\_ID 5752. Diagnosis Test/Med Decision - Remediation. 3 Credits.**

Diagnosis Test/Med Decision - Remediation.

**MED\_ID 5753. Pathophysiology II - Remediation. 6 Credits.**

Pathophysiology II - Remediation.

**MED\_ID 5754. Psychopathology/Behavioral Med - Remediation. 3 Credits.**

Psychopathology/Behavioral Med - Remediation.

**MED\_ID 5755. Pathophysiology III - Remediation. 6 Credits.**

Pathophysiology III - Remediation.

**MED\_ID 5756. Clinical Practicum - Remediation. 3 Credits.**

Clinical Practicum - Remediation.

**MED\_ID 5757. Pathophysiology IV - Remediation. 6 Credits.**

Pathophysiology IV - Remediation.

**MED\_ID 5758. Physician as a Person - Remediation. 3 Credits.**

Physician as a Person - Remediation.

**MED\_ID 5761. Advanced Physical Diagnosis 1- Remediation. 1 Credit.**

Advanced Physical Diagnosis 1- Remediation.

**MED\_ID 5762. Advanced Physical Diagnosis 2- Remediation. 1 Credit.**

Advanced Physical Diagnosis 2- Remediation.

**MED\_ID 5763. Advanced Physical Diagnosis 3- Remediation. 1 Credit.**

Advanced Physical Diagnosis 3- Remediation.

**MED\_ID 5764. Advanced Physical Diagnosis 4- Remediation. 1 Credit.**

Advanced Physical Diagnosis 4- Remediation.

**MED\_ID 6100. Advanced Elective. 3 Credits.**

Advanced Elective - 0 Credit.

**MED\_ID 6200. ABS Advanced Basic Science. 5 Credits.**

ABS Advanced Basic Science.

**MED\_ID 6235. ABS DERMATOLOGY RSCH&REV. 5 Credits.**

ABS Dermatology Research and Review.

**MED\_ID 6243. ABS EMERGENCY MED RSCH. 5 Credits.**

ABS Emergency Medicine Research.

**MED\_ID 6244. ABS Quality Improvement and Patient Safety Elective. 5 Credits.**

The 4th year student will work with leaders in the Office of Clinical Effectiveness to identify an improvement project to be conducted during the elective. Students will have self-paced readings/didactic expectations, and will be expected to review and report on medical literature relevant to the care process(es) targeted for improvement. To complete their project, the student will present the improvement work to patient safety and quality improvement leaders, as well as stakeholders in the care process(es) identified for improvement efforts.

**MED\_ID 6390. ABS Individualized Study in Medicine-M1. 5 Credits.**

Prerequisites: M4s registering for PBL tutoring must be in good standing and not on probation. M4s must not have come before the CSP for an automatic vote for dismissal. Goals/Objectives: Participate in PBL as a tutor under the guidance of an experienced faculty tutor. Review the literature appropriate to each case. Update one PBL case that is used in the course of the block OR update a problem solving exam OR write a new problem solving exam. Students must submit the case or exam electronically to the course coordinator. Evaluation: Student's performance as tutor will be evaluated by the supervising faculty member and the tutor group members. Notes: During a four-week block, the fourth year student will tutor an M-1 PBL group (Monday, Wednesday, & Friday mornings) under the supervision of a senior faculty member. Contact course coordinator for case update details. Submission date for case update is set two weeks after the tutoring session ends. The student will attend all tutor preparation meetings and prepare for PBL through reading, self-directed study and discussions with faculty. Complete student mid-block and end-of-block evaluation as directed.

**MED\_ID 6391. ABS Individualized Study in Medicine-M2. 5 Credits.**

ABS Individualized Study in Medicine-M2.

**MED\_ID 6393. ABS Interdisciplinary Research. 5-10 Credit.**

ABS Interdisciplinary Research.

**MED\_ID 6394. ABS Cross-Cultural Medicine. 5 Credits.**

ABS Cross-Cultural Medicine.

**MED\_ID 6395. ABS Interdisciplinary Research and Review. 5-10 Credit.**

ABS Interdisciplinary Research and Review.

**MED\_ID 6396. ABS Medical Practice Organization. 5-10 Credit.**

ABS Medical Practice Organization.

**MED\_ID 6397. ABS Academic Tutoring for M1/M2 Students. 5 Credits.**

ABS Academic Tutoring for M1/M2 Students.

**MED\_ID 6398. ABS County Public Health. 5 Credits.**

ABS County Public Health.

**MED\_ID 6399. ABS Case Writing. 5 Credits.**

ABS Case Writing.

**MED\_ID 6690. Elective Individual Study in Medicine - M1. 5 Credits.**

Elective Individual Study in Medicine - M1.

**MED\_ID 6691. Elective Individual Study in Medicine - M2. 5 Credits.**

Prerequisites: M4s registering for PBL tutoring must be in good standing and not on probation. M4s must not have come before the CSP for an automatic vote for dismissal. Goals/Objectives: Participate in PBL as a tutor under the guidance of an experienced faculty tutor. Evaluations: the student's performance as tutor will be evaluated by the supervising faculty member and the tutor group members. Notes: During the four-week block, the fourth year student will tutor a M-2 PBL group (Tuesday and Thursday afternoons) under the supervision of a senior faculty member.

**MED\_ID 6692. Case Writing Elective. 5 Credits.**

Case Writing Elective.

**MED\_ID 6693. Simulation Preparation for Internship. 5 Credits.**

This course is meant to increase the medical students' knowledge and skillsbase in preparation for the first year of internship. In order to accomplish this, the students will be exposed to a variety situations common to first year residents through activities created with simulation. Throughout the course, students will demonstrate how to provide effective and efficient patient-centered care, while improving their communication skills and professionalism with patients and other healthcare providers. Students will understand the role of simulation in medical education and develop skills in debriefing of scenarios throughout the course. At the end of the course, students will be expected to complete a simulation capstone project. Prerequisite: Class level: 4th year medical student. Approval by Simulation Director and Completion of all Core Clerkship Requirements.

**MED\_ID 6890. Computer Applications in Medicine. 5 Credits.**

Computer Applications in Medicine.

## Microbiology (MICROB)

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**MICROB 2800. Microbiology for Nursing and Health Professions. 4 Credits.**

This course will provide basic principles for understanding microbial growth, function, and control. This includes a survey of microbial cellular structure/functions, immunology concepts, epidemiology, specimen handling, and causes of microbial disease (bacterial, viral, and parasitic). Material is presented in lecture and corresponding laboratory exercises that will allow students to explore the microbial world around them. The overall content is "restricted to Freshman and sophomore Nursing and Health Related Professional students only". Other inquires contact department.

**MICROB 3200. Medical Microbiology and Immunology. 4 Credits.**

Focus on medically important viruses, bacteria, fungi and parasites with emphasis on their disease causing potential and mechanisms. Introduction to cells and molecules of the immune system with emphasis on their role in fighting infectious diseases. Discussion of treatment and prevention strategies. Lecture material will be reinforced with laboratory demonstrations and hands-on exercises. The course is intended for preprofessional students.

**MICROB 4300. Bacterial Pathogenesis. 2 Credits.**

This team taught course covers the biology and virulence mechanisms of bacterial pathogens, with emphasis on those causing human and zoonotic diseases. Topics covered include bacterial structure, genetics, physiology, and metabolism; antibiotic resistance; host-pathogen interactions; microbiomes and emerging pathogens.

**MICROB 4303. Fundamental Virology. 2 Credits.**

Classification of viruses, life cycles, genome organization and expression, host-virus interactions, oncogenes and cellular transformation, viral pathogenesis, viral gene therapy approaches, strategies for anti viral therapy. Prerequisite: undergraduates require instructor's consent. This course will include evaluation of current literature and require paper presentations.

**MICROB 4304. Immunology. 3 Credits.**

This is a comprehensive team-taught, basic immunology course covering cells and organs of the immune system, lymphocyte development, innate immunity, antibody production, antibody-antigen presentation, CD4+ and CD8+ T lymphocyte responses, cytokines, autoimmunity and immunodeficiency among other immunologically relevant topics. Completion of a biochemistry, genetics, or molecular biology course would be helpful. Prerequisites: Microbiology [MICROB] 3200 or Biochemistry [BIOCHEM] 4270 recommended.

**MICROB 4305H. Honors Bacterial Pathogenesis. 2 Credits.**

This team taught course covers the biology and virulence mechanism of bacterial pathogens, with emphasis on those causing human and zoonotic diseases. Topics covered include bacterial structure, genetics, physiology, and metabolism; antibiotic resistance; host-pathogen interactions; microbiomes and emerging pathogens. Honors eligibility required.

**MICROB 6291. ABS Microbiology Mechanism of Disease. 5-10 Credit.**

ABS Microbiology Mechanism of Disease.

**MICROB 6293. ABS Microbiology Research. 5-10 Credit.**

ABS Microbiology Research.

**MICROB 6295. ABS Microbiology Research and Review. 5-10 Credit.**

ABS Microbiology Research and Review.

**MICROB 7303. Fundamental Virology. 2 Credits.**

Classification of viruses, life cycles, genome organization and expression, host-virus interactions, oncogenes and cellular transformation, viral pathogenesis, viral gene therapy approaches, strategies for anti viral therapy. Prerequisites: Undergraduates require instructor's consent. This course will include evaluation of current literature and require paper presentations.

**MICROB 7304. Immunology. 2 Credits.**

Covers innate immunity, antibodies, antigens, MHC, antigen presentation, lymphocyte development, antigen specific receptors, lymphocyte activation and differentiation, immune effector mechanisms, hypersensitivities, tolerance, autoimmunity, immunodeficiencies. Prerequisites: Microbiology [MICROB] 3200 or Biochemistry [BIOCHEM] 4270 or 4272 recommended or instructor's consent.

**MICROB 7404. Bacterial Pathogenesis. 2 Credits.**

This team taught course covers the biology and virulence mechanisms of bacterial pathogens, with emphasis on those causing human and zoonotic disease. Topics covered include bacterial structure, genetics, physiology, and metabolism; antibiotic resistance; host-pathogen

interactions; microbiomes and emerging pathogens. Prerequisite: graduate standing.

**MICROB 8050. Graduate Student Survival Skills. 1 Credit.**

This course is an introduction to inform new graduate students about the Microbiology program and provide them with the knowledge to access resources and information needed for a successful transition into their course work and research. The course will also focus on guidelines in selecting mentors and their relationships, time management, good notebook practices, presentation and posters, comprehensive exams, and computer skills needed. Graduate standing required. Graded on S/U basis only.

**MICROB 9001. Topics in Microbiology. 1-99 Credit.**

Current topics, highly specialized topics taught infrequently, or courses taught by visiting professors. Prerequisite: graduate standing and instructor's consent.

**MICROB 9085. Problems in Microbiology. 1-99 Credit.**

Students assigned individual problems in microbiology for library or lab investigation. Prerequisite: graduate standing and instructor's consent. Graded on S/U basis only.

**MICROB 9087. Seminar in Microbiology. 1 Credit.**

Presentation and critical discussion of student and staff research, current literature, and guest lectures on subjects in various areas of microbiology. Prerequisite: graduate standing. Graded on S/U basis only.

**MICROB 9090. Research in Microbiology. 1-99 Credit.**

Original investigations in various areas of microbiology related to bacteria, fungi, rickettsia, viruses, and animal parasites, or immunology relating to antigens and antibodies of infectious and noninfectious nature designed for graduate thesis research. Prerequisite: graduate standing and instructor's consent. Graded on a S/U basis only.

**MICROB 9403. Advanced Medical Microbiology. 2 Credits.**

Similar to Molecular Microbiology and Immunology [MICROB] 4300 but treats medical microbiology and immunology in a more advanced manner. Methods of preparation and instruction stressed. Prerequisite: graduate standing and instructor's consent. Graded on S/U basis only.

**MICROB 9407. Advanced Immunology. 3 Credits.**

Lectures and discussions emphasizing theoretical aspects of immunology and detailed considerations of the more involved areas of this science. Prerequisites: Molecular Microbiology and Immunology [MICROB] 4304 or equivalent, graduate standing and instructor's consent.

**MICROB 9411. Responsible Conduct of Research. 1 Credit.**

Ethical, legal and sociological ramifications of research including data management, authorship, human and animal use, conflict of interest and misconduct. Round table discussions and interactive forums. Grading based on participation in discussions and assignments. Prerequisite: graduate standing. Graded on S/U basis only.

**MICROB 9430. Molecular Biology I. 4 Credits.**

(same as Biochemistry [BIOCHM] 9430). Detailed examination of current fundamental concepts of molecular genetics of bacteria, bacteriophages and yeast. Experimental approaches to analysis of the physical structures of genomic nucleic acids, the biochemistry and genetics of mutations, replications, gene transfer and gene expression will be examined in depth from reports in the current literature. Prerequisite: Biochemistry, genetics, and graduate standing.

**MICROB 9432. Molecular Biology II. 4 Credits.**

(same as Biochemistry [BIOCHM] and Biological Sciences [BIO\_SC] 9432). Detailed experimental analysis of eukaryotic cellular and molecular

biology relevant to cellular and viral gene expression, post-transcriptional and post-translational modifications and genome replication. Models for developmental genetic analysis and genetic determinants controlling developmental processes utilizing the current literature will be examined. Prerequisite: Molecular Microbiology and Immunology [MICROB] 9430, graduate standing.

**MICROB 9449. Infection and Immunity. 4 Credits.**

Writing, discussion, literature driven course, covering topics that focus on the interface between infectious diseases, cancer and the immune system. Prerequisites: 2nd year Graduate student with bacteriology, virology, microbial pathogenesis and immunology background only. 1st year graduate students require instructor approval. Graded A-F basis only. May be repeated for credit.

## **Military Science (MIL\_SC)**

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**MIL\_SC 1100. Foundations of Officership. 1 Credit.**

Introduces students to issues and competencies that are central to a commissioned officer's responsibilities. Establish framework for understanding officership, leadership, and Army values followed and "life skills" such as physical fitness and time management.

**MIL\_SC 1110. Introductory Military Science Laboratory I. 1 Credit.**

Field application of skills taught in Military Science 1100, to include leadership, land navigation, tactical skills and basic soldier skills. Prerequisite: Military Science [MIL\_SC] 1100.

**MIL\_SC 1120. Basic Leadership. 1 Credit.**

Establishes foundation of basic leadership fundamentals such as problem solving, communication, briefings and effective writing, goal setting, techniques for improving listening and speaking skills and an introduction to counseling.

**MIL\_SC 1130. Introductory Military Science Laboratory II. 1 Credit.**

Field application of skills taught in Military Science 1120, to include leadership, land navigation, tactical skills and basic soldier skills. Prerequisite: Military Science [MIL\_SC] 1120.

**MIL\_SC 2200. Individual Leadership Studies. 2 Credits.**

Students identify successful leadership characteristics through observation of others and self through experimental learning exercises. Students record observed traits (good and bad) in a dimensional leadership journal and discuss observations in small group settings.

**MIL\_SC 2210. Intermediate Military Science Laboratory I. 1 Credit.**

Progressively more challenging leadership scenarios presented in a field and classroom environment. Students practice basic military skills such as squad-level offensive and defensive operations. First aid topics and drill and ceremony are also taught. Prerequisite: Military Science [MIL\_SC] 2200.

**MIL\_SC 2220. Leadership and Teamwork. 2 Credits.**

Study examines how to build successful teams, various methods for influencing action, effective communication in selling and achieving goals, the importance of timing the decision, creativity in the problem solving process, and obtaining team buy-in through immediate feedback.

**MIL\_SC 2230. Intermediate Military Science Laboratory II. 1 Credit.**

Progressively more challenging leadership scenarios presented in a field and classroom environment. Students practice basic military skills such as platoon-level offensive and defensive operations. Practical application of night land navigation. Prerequisite: Military Science [MIL\_SC] 2220.

**MIL\_SC 3160. Death by a Thousand Cuts: Counterinsurgency/Insurgency the American Experience. 3 Credits.**

This course explores the problem of insurgency and counterinsurgency in terms of what we can learn from these conflicts. It examines counterinsurgency theory and practice, the Philippine Insurrection, Banana Wars, Vietnam War, Afghanistan, and Iraq.

**MIL\_SC 3161. The American Experience in Vietnam. 3 Credits.**

This course was developed to provide students the opportunity to examine the American experience in the Vietnam War, to search for meanings in this experience, and to arrive at their own conclusions concerning the impact of the war upon the nation. Moreover, it challenges the students to think critically about war and the use of military power to settle differences between nations. May be repeated for credit.

**MIL\_SC 3162. Counterinsurgency in Asia. 3 Credits.**

This course explores the problem of insurgency and counterinsurgency in Asia in terms of what we can learn from these conflicts. The course examines the insurgency in the Philippine Insurrection 1899-1902, the Vietnam War, the Soviet-Afghan War, in Thailand, Sri Lanka and Malayan Emergency. May be repeated for credit.

**MIL\_SC 3163. U.S. Military History in the Western Tradition. 3 Credits.**

Analysis of United States military history from the Colonial period to the present, (1609-2012). It is a comprehensive look into the evolution of warfare in America, military traditions and heritage, and technology. This course analyzes the following: American Revolution, War of 1812, Mexican American War, Civil War, Indian Wars, Spanish American War, World War I, Inter War Period, World War II, Korean War, Vietnam War, Gulf War, Afghanistan and Iraq. All cadets are required to take this course for commissioning. May be repeated for credit.

**MIL\_SC 3230. Leadership and Problem Solving. 3 Credits.**

Students conduct self-assessment of leadership style, develop personal fitness regimen, and learn to plan and conduct individual/small unit tactical training while testing reasoning and problem-solving techniques. Students receive direct feedback on leadership abilities. Prerequisite: departmental consent.

**MIL\_SC 3240. Leadership and Ethics. 3 Credits.**

Examines the role communications, values, and ethics play in effective leadership. Topics include ethical decision-making, considerations of others, spirituality in the military, and survey Army leadership doctrine. Emphasis on improving oral and written communication ability. Prerequisite: Military Science [MIL\_SC] 3230.

**MIL\_SC 3250. Leadership and Management. 3 Credits.**

Develops student proficiency in planning and executing complex operations, functioning as a member of a staff, and mentoring subordinates. Students explore training management, methods of effective staff collaboration, and developmental counseling techniques. Prerequisite: Military Science [MIL\_SC] 3240.

**MIL\_SC 3260. Officership. 3 Credits.**

Study includes case study analysis of military law and practical exercises on establishing an ethical command climate, service as an officer; capstone exercise. Leadership lab Students must complete a semester long Senior Leadership Project that requires them to plan, organize, collaborate, analyze, and demonstrate their leadership skills. Prerequisite: Military Science [MIL\_SC] 3250.

**MIL\_SC 3270. Advanced Transition to Lieutenant I. 3 Credits.**

Independent research, analysis and monthly discussion on related military topics. Personal, academic and professional goals and objectives, development and maintenance of an officer evaluation report support form. Prerequisites: Military Science [MIL\_SC] 1100, 2200, 3230, and 3250 or department head permission.

**MIL\_SC 3280. Advanced Transition to Lieutenant II. 3 Credits.**

Independent research, analysis and monthly discussion on related military topics. Personal academic and professional goals and objectives, development and maintenance of an officer evaluation report support form. Prerequisites: Military Science [MIL\_SC] 1100, 2200, 3230, and 3250 or department head permission.

## MU Informatics Institute (INFOINST)

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**INFOINST 7005. Introduction to Bioinformatics: Tools and Applications. 3 Credits.**

Course will provide the introduction to the current directions in bioinformatics through the computational tools available to research community. Students will learn how to efficiently apply the tools and software packages as well as analyze and visualize the results. Instructors consent or Graduate standing required. A-F Grading Only.

**INFOINST 7010. Computational Methods in Bioinformatics. 3 Credits.**

(same as Computer Science [CMP\_SC] 7010). Fundamental concepts and basic computational techniques for mainstream bioinformatics problems. Emphasis placed on computational aspect of bioinformatics including formulation of a biological problem, design of algorithms, confidence assessment of software development. Prerequisites: Computer Science [CMP\_SC] 4050 and Statistics [STAT] 4710. Graduate Standing Required. Graded on A/F basis only.

**INFOINST 7430. Introduction to Health Informatics. 3 Credits.**

(same as Health Management and Informatics [HMI] 7430). Introduction to the use of clinical information systems in healthcare. Topics include clinical data, standards, electronic medical records, computerized provider order entry, decision support, telemedicine, and consumer applications. Prerequisite: graduate standing; departmental consent. Graded on A/F basis only.

**INFOINST 8001. Topics in Informatics. 3 Credits.**

Organized study of selected topics. Subjects and earned credit may vary from semester to semester. Repeatable upon consent of department. Graduate Standing Required. Graded A-F only.

**INFOINST 8010. Problem Solving in Bioinformatics. 3 Credits.**

(Same as Computer Science [CMP\_SC] 8110). The course covers a variety of bioinformatics research topics such as biological sequence comparison, protein structure prediction, protein and gene function prediction, and inference and modeling of biological networks. Prerequisites: Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010. Graduate Standing Required. Graded on A/F basis only.

**INFOINST 8085. Problems in Informatics. 3 Credits.**

Independent, directed study on a topic in the area of informatics. Graduate Standing Required, Consent of Instructor Required. Graded on S/U basis only.

**INFOINST 8087. Seminar in Informatics. 0.5-1 Credit.**

Students attend and/or present at informatics seminars approved by the institute. Graduate Standing Required, consent of instructor required. Graded on S/U basis only.

**INFOINST 8088. Lab Rotations in Informatics. 1-3 Credit.**

This course is designed to train students in both computational/informatics and life science/hospital laboratories to foster critical research collaborations in biomedical informatics. Students are expected to write reports with their advisors and the mentor of the rotation. Prerequisite: graduate standing required. Graded on S/U basis only.

**INFOINST 8090. Dissertation (pre-candidacy) Research in Informatics. 1-99 Credit.**

Research leading to dissertation before comprehensive examination. Graduate Standing Required. Graded on S/U basis only.

**INFOINST 8150. Integrative Methods in Bioinformatics. 3 Credits.**

(same as Computer Science [CMP\_SC] 8150), Introduces the most popular experimental methods from the point of view of the information sources that can be used. Students will use data obtained directly from biological experiments and learn how to suggest new experiments to improve results. Prerequisite: MU informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010. Graded on A/F basis only.

**INFOINST 8180. Machine Learning Methods for Biomedical Informatics. 3 Credits.**

(same as Computer Science [CMP\_SC] 8180). Teaches statistical machine learning methods and applications in biomedical informatics. Covers theories of advanced statistical machine learning methods and how to develop machine learning methods to solve biomedical problems. Prerequisite: Computer Science [CMP\_SC] 7050 and MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010 or 7005. Graded on A/F basis only.

**INFOINST 8190. Computational Systems Biology. 3 Credits.**

(same as Computer Science [CMP\_SC] 8390). This course covers current theories and methods in the modeling and analysis of high-throughput experiments such as microarrays, proteomics, and metabolomics. Topics include the inference of causal relations from experimental data and reverse engineering of cellular systems. Graded on A/F basis only. Prerequisites: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010; MU Informatics Institute [INFOINST] 8010.

**INFOINST 8210. Structural Bioinformatics of Proteins, Complexes, System. 3 Credits.**

(same as Computer Science [CMP\_SC] 8120). Main course objective is to provide an introduction to the state-of-the-art methods in structural bioinformatics. The course will cover the methods that are applied to a wide range of biomolecular objects from protein domains and small proteins to large biological systems. Graded on A/F basis only. Prerequisites: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010; Computer Science [CMP\_SC] 4050/7050 is preferable.

**INFOINST 8310. Computational Genomics. 3 Credits.**

(same as Computer Science [CMP\_SC] 8130). This course introduces computational concepts and methods of genomics to students. The course covers genome structure, database, sequencing, assembly, annotation, gene and RNA finding, motif and repeats identification, single nucleotide polymorphism, and epigenomics. Graded on A/F basis only. Prerequisites: MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010. Graduate Standing Required.

**INFOINST 8350. Integrative Methods in Bioinformatics. 3 Credits.**

Course objective is to introduce the most popular experimental methods from the point of view of the information sources that can be used in. Students will learn to use data obtained directly from biological experiments and how to suggest new experiments to improve results. Prerequisite: MU Informatics Institute [INFOINST] Computer Science [CMP\_SC] 7010. Graduate Standing Required. Graded on A/F basis only.

**INFOINST 8390. Computational Systems Biology. 3 Credits.**

This course covers current theories and methods in the modeling and analysis of high-throughput experiments such as microarrays, proteomics, and metabolomics. Topics include the inference of casual relations from experimental data and reverse engineering of cellular systems. Prerequisite: MU Informatics Institute/Computer Science [INFOINST/CMP\_SC] 7010; INFOINST 8010 or instructors consent. Graduate Standing Required. Graded A-F only.

**INFOINST 8810. Research Methods in Health and Biomedical Informatics. 3 Credits.**

(same as Health Management and Informatics [HMI] 8810) Research Methods in Health and Bioinformatics is a writing intensive course that provides students with an understanding of research proposal development, literature searching, research synthesis, research designs, evaluation methods, and ethics. Prerequisites: Statistics [STAT] 7450 or STAT 7510, second semester or later in PHD program or instructors consent. Graduate standing required. Graded A-F only.

**INFOINST 8860. Content Management in Biomedical Informatics. 3 Credits.**

(same as Computer Science [CMP\_SC] 8160). This course introduces theory and techniques for content extraction, indexing, and retrieval of biomedical media databases. Topics include biomedical media databases, feature extraction methods, advanced database indexing structures, query methods, and result visualization. Graded on A/F basis only. Prerequisites: Computer Science [CMP\_SC] 7380 and MU Informatics Institute [INFOINST] 7010. Graduate standing required. .

**INFOINST 8870. Knowledge Representation in Biology and Medicine. 3 Credits.**

(Same as Health Management and Informatics [HMI] 8870) The main topics presented in the course are: logic systems, knowledge representation methods, production systems and representation of statistical and uncertain knowledge. Prerequisites: Computer Science [CMP\_SC] 2050(Java), MU Informatics Institute [INFOINST] 7430. Graduate standing required. Graded A-F only.

**INFOINST 8880. Machine Learning Methods for Biomedical Informatics. 3 Credits.**

(same as Computer Science [CMP\_SC] 8180) This course teaches statistical machine learning methods and their applications in biomedical informatics. The course covers theories of advanced statistical machine learning methods and teaches how to develop machine learning methods to solve biomedical problems. Prerequisites: Computer Science [CMP\_SC] 7050 and MU Informatics Institute [INFOINST]/Computer Science [CMP\_SC] 7010 or MU Informatics Institute [INFOINST] 7005. Graduate standing required. Graded on A/F basis only.

**INFOINST 9090. Dissertation (post-candidacy) Research in Informatics. 1-99 Credit.**

Research leading to Ph.D. dissertation after comprehensive examination. Graded on S/U basis only. Graduate standing required.

## Music-Applied Music (MUS\_APMS)

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**MUS\_APMS 1435. Studio Instruction for Majors. 1 Credit.**

Acceptable as a secondary applied subject on B.S. in music education and B.M. degrees. Materials varies according to educational purpose. May be repeated for credit. Prerequisite: instructor's consent.

**MUS\_APMS 2455. Studio Instruction. 1-5 Credit.**

Credit accepted toward all undergraduate music and music education degrees. May be repeated for credit. Prerequisite: instructor's consent.

**MUS\_APMS 3455. Studio Instruction. 1-3 Credit.**

Accepted as upperclass credit only in Music Education, music theory, history, or composition. May be repeated for credit. Prerequisites: 8 hours and 4 semesters of Music-Applied Music [MUS\_APMS] 2455 or equivalent; audition by committee, and instructor's consent.

**MUS\_APMS 3970. Junior Recital. 1 Credit.**

Preparation and presentation of Junior Recital. Appropriate applied music course to be taken concurrently. May be repeated for credit. Each recital must be approved by a committee at least two weeks before the recital.

**MUS\_APMS 4455. Studio Instruction. 1-5 Credit.**

For B.M. degrees in performance. Study of pedagogy in studio class. May be repeated for credit. Prerequisite: 8 hours and 4 semesters of Music-Applied Music [MUS\_APMS] 2455; audition; instructor's consent.

**MUS\_APMS 4970. Senior Recital. 1 Credit.**

Preparation and presentation of Senior Recital. Appropriate applied music course to be taken concurrently. May be repeated for credit. Each recital must be approved by a committee at least two weeks before the recital.

**MUS\_APMS 7435. Studio Instruction. 1 Credit.**

For music teachers needing instruction in secondary instruments or voice. Maybe repeated for credit.

**MUS\_APMS 7455. Studio Instruction. 1-5 Credit.**

For graduate credit on M.A., M.Ed., and Ph.D. degrees. Study of pedagogy in studio class. May be repeated for credit. Prerequisite: audition; instructor's consent.

**MUS\_APMS 8455. Studio Instruction. 1-5 Credit.**

Required for graduate credit as major applied study on M.M. degree. Acceptable for graduate credit on M.A., M.Ed., Ed.D., and Ph.D. degrees. Maybe repeated for credit. Prerequisites: audition by committee and instructor's consent.

**MUS\_APMS 8970. Graduate Recital. 1 Credit.**

Preparation and presentation of Graduate Recital. Appropriate applied music course to be taken concurrently. May be repeated for credit. Each recital must be approved by a committee at least two weeks before the recital.

## Music-Courses for Non-Majors (MUSIC\_NM)

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**MUSIC\_NM 1005. Topics in Music-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects vary from semester to semester. May be repeated once for additional credit with departmental consent.

**MUSIC\_NM 1029. Music Travel Course. 1-4 Credit.**

Study tour designed to broaden perspective of persons interested in music. Stresses relationship of music to art and ideas in a variety of social and cultural contexts. Participant bears cost of course. Prerequisite: instructor's consent.

**MUSIC\_NM 1085. Problems in Music. 1-99 Credit.**

Independent investigation leading to a paper project. May be repeated for credit. Prerequisite: instructor's consent. Sections are: Music Theory, Music Composition, Music History, Music Performance/Pedagogy.

**MUSIC\_NM 1211. Fundamentals of Music I. 2 Credits.**

Introduction to rhythmic, melodic, harmonic, and structural elements of music. Designed for non-music majors. No credit for music majors or minors.

**MUSIC\_NM 1212. Fundamentals of Music II. 2 Credits.**

Continuation of Music - Courses for Non-Majors [MUSIC\_NM] 1211. No credit for music majors or minors. Prerequisites: Grade of C- or better in MUSIC\_NM 1211 or instructor's consent.

**MUSIC\_NM 1300. Experiencing Music Through Concert Attendance. 1 Credit.**

Development of music listening skills through concert attendance, reading and class attendance.

**MUSIC\_NM 1310. Masterpieces of Western Music. 3 Credits.**

Introduction to the Western fine-art tradition through the study of representative masterworks, emphasis on developing listening skills; directed to non-majors.

**MUSIC\_NM 1311. Jazz, Pop, and Rock. 3 Credits.**

Historical introduction to jazz (to approximately 1970) and the American popular song, including rock and roll (to approximately 1980); directed to non-majors.

**MUSIC\_NM 1312. History of Jazz. 2 Credits.**

Historical survey of American jazz from its origin to the present. No credit for students who have taken Music - Courses for Non-Majors [MUSIC\_NM] 1311.

**MUSIC\_NM 1313. Introduction to World Music. 3 Credits.**

Introduction to the musical traditions of selected non-Western societies; emphasis on developing listening skills; directed to non-majors, but music majors may enroll.

**MUSIC\_NM 1314. Orchestral Masterpieces. 3 Credits.**

In-depth study of selected symphonic works of masters from Joseph Haydn to Aaron Copland. Students develop critical listening skills to identify orchestral instruments and perceive the structure and character of selected orchestral works. Directed to non-music majors. Graded on A/F basis only.

**MUSIC\_NM 1315. Musical Profile-Bach. 1 Credit.**

Systematic study of the music of J.S. Bach directed to the general student. Graded on A/F basis only.

**MUSIC\_NM 1316. Music Profile--Wolfgang A. Mozart. 1 Credit.**

A systematic introduction to the music of Wolfgang Amadeus Mozart. Graded on A/F basis only.

**MUSIC\_NM 1317. Musical Profile-Beethoven. 1 Credit.**

Systematic study of the music of Ludwig van Beethoven directed to the general student. Graded on A/F basis only.

**MUSIC\_NM 1318. Music Profile--Claude Debussy. 1 Credit.**

A systematic introduction to the music of Claude Debussy. Graded on A/F basis only.

**MUSIC\_NM 1319. Music Profile--Igor Stravinsky. 1 Credit.**

A systematic introduction to the music of Igor Stravinsky. Graded on A/F basis only.

**MUSIC\_NM 1320. Musical Profile-Copland. 1 Credit.**

Systematic study of the music of Aaron Copland directed to the general student. Graded on A/F basis only.

**MUSIC\_NM 1330. Introduction to African-American Music. 3 Credits.**

Introduction to the history and scholarship of African American music from eighteenth through twentieth centuries. Focus on African legacies and retentions, slave culture, the black church, minstrelsy, folk traditions, spirituals, ragtime, blues, jazz, soul, R&B, and hip hop.

**MUSIC\_NM 1335. Introduction to Soul and Country. 3 Credits.**

Examination of musical cultures signified by "soul" and "country". Study of the evolution and aesthetics of these genres and how they deal with concepts like identity, class, race, and ethnicity; gender and sexuality; politics and patriotism.

**MUSIC\_NM 1340. Music of Love and Death. 3 Credits.**

Exploration of musical expression surrounding love and death in specific works of diverse styles and sociological contexts. Students will learn to listen to and appreciate music with informed ears and minds, develop strong perceptual skills, and cultivate a musical vocabulary.

**MUSIC\_NM 1341. Drama Through Western Music. 3 Credits.**

Introduction to the musical culture of the theater through the ages by examining specific works of diverse styles and sociological contexts. Students learn to listen to and appreciate music with informed ears and minds, develop perceptual skills, and cultivate musical vocabulary.

**MUSIC\_NM 1445. Studio Instruction. 1 Credit.**

Acceptable for non-majors and majors requiring a half-hour lesson with instructor's consent. May be repeated for credit.

**MUSIC\_NM 1608. Beginning Piano Class. 1 Credit.**

For non-music majors only.

**MUSIC\_NM 1609. Intermediate Piano Class. 1 Credit.**

For non-music majors only. Continuation of Music-Instrumental and Vocal Techniques 1608.

**MUSIC\_NM 1612. Elementary Folk Guitar Class. 1 Credit.**

Teaching correct hand position, strum patterns, and chords needed for accompaniment of popular and folk songs.

**MUSIC\_NM 1615. Beginning Classical Guitar Class. 1 Credit.**

Beginning Classical Guitar Class.

**MUSIC\_NM 1617. Beginning Drumset. 1 Credit.**

Fundamentals of the drumset, including an historical survey and biographical sketch of several performers. Also can be used as a pedagogical outline for future music teachers.

**MUSIC\_NM 1618. Basic Music Skills. 2 Credits.**

Development of music reading and performance skills, including study of pitch, rhythm, notation, structure and interpretation of music. Emphasis on performance. No credit for music majors or minors or students who

have completed Music - Music Courses for Non Majors [ MUSIC\_NM] 1211 or 1212.

**MUSIC\_NM 1651. Voice Class I. 1 Credit.**

Fundamentals of singing: posture, breath support, control, vocalization, concepts of tone quality, placement and resonance. Literature selected for students with no previous vocal training. Adapted to needs of drama and other interdisciplinary students.

**MUSIC\_NM 1652. Voice Class II. 1 Credit.**

Continuation of Music-Instrumental and Vocal Techniques 1651. Prerequisite: Music - Courses for Non-Majors [MUSIC\_NM] 1651.

**MUSIC\_NM 2306. Perceiving Musical Traditions and Styles. 3 Credits.**

An introduction to music from the late Baroque to the present day, including fine art, folk, and popular music. Designed to serve as a foundation for developing knowledge and skills of musical perception that will eventually lead to thoughtful written commentary on musical performances. Prerequisites: open only to Journalism majors with sophomore standing or higher. Graded on A/F basis only.

**MUSIC\_NM 2306H. Perceiving Musical Traditions and Styles - Honors. 3 Credits.**

An introduction to music from the late Baroque to the present day, including fine art, folk, and popular music. Designed to serve as a foundation for developing knowledge and skills of musical perception that will eventually lead to thoughtful written commentary on musical performances. Prerequisites: open only to Journalism majors with sophomore standing or higher. Graded on A/F basis only. Honors eligibility required.

**MUSIC\_NM 2445. Studio Instruction for Non-Majors. 1-2 Credit.**

Acceptable for non-majors only. Prerequisites: audition by examining committee and instructor's consent. May be repeated for credit.

**MUSIC\_NM 4445. Studio Instruction for Non-Majors. 1-2 Credit.**

Acceptable for non-majors only. Prerequisites: audition by examining committee and instructor's consent. May be repeated for credit.

**MUSIC\_NM 7029. Travel Seminar. 1-4 Credit.**

Selected topics for directed study in music undertaken in context of the tour. Emphasis on subjects with cross-disciplinary implications. Participant bears cost of course. Prerequisite: instructor's consent.

**MUSIC\_NM 7445. Studio Instruction for Non-Majors. 1-2 Credit.**

Acceptable for graduate s credit for non-majors only. May be repeated for credit. Prerequisite: instructor's consent.

## Music-Ensemble Courses (MUS\_ENS)

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**MUS\_ENS 1841. Instrumental Ensemble. 1 Credit.**

Provides experience in instrumental performance and repertory. Open to all UMC students by audition. May be repeated for credit. Enrollment in Marching Band is limited to a maximum of five semesters. Prerequisite: Audition. Sections are: Philharmonic Orchestra, Chamber Orchestra, Symphonic Band, Wind Ensemble, Concert Band, Varsity Band, Studio Jazz Ensemble, Jazz Lab Band, Marching Band.

**MUS\_ENS 1842. Choral Ensemble. 1 Credit.**

Provides experience in choral performance and repertory. Open to all UMC students. May be repeated for credit. Prerequisite: audition required



for all but Choral Union; sections are: University Singers, Chamber Singers, Choral Union, Vocal Jazz Ensemble, Concert Chorale, Men's Chorus, Women's Chorus.

**MUS\_ENS 1846. Chamber Music. 1 Credit.**

Preparation and performance of chamber music. May be repeated for credit. Prerequisites: audition and instructor's consent. Sections are: String Ensemble, Woodwind Ensemble, Brass Ensemble, Percussion Ensemble, Jazz Combo.

**MUS\_ENS 1865. Opera Workshop. 1-2 Credit.**

Study, preparation and performance of selected operatic or musical theatre work in staged or concert versions. Open to all UMC students by audition. Credit arranged; may be repeated for credit. Prerequisite: audition and instructor's consent.

**MUS\_ENS 2843. Piano Ensemble. 1 Credit.**

Study, preparation, and performance of ensemble literature for piano. May be repeated for credit. Prerequisite: instructor's consent.

**MUS\_ENS 4866. Musical Theatre Performance. 3 Credits.**

(same as Theatre [THEATR] 4460). A practical study for the actor of theatrical songs through character analysis, lyric interpretation, and movement. A performance course. Prerequisite: instructor's consent.

**MUS\_ENS 8841. Instrumental Ensemble. 1 Credit.**

Research, preparation and performance of instrumental compositions. May be repeated for credit. Prerequisites: audition and instructor's consent. Sections and credit hours are: Philharmonic Orchestra, Chamber Orchestra, Symphonic Band, Wind Ensemble, Concert Band, Studio Jazz Ensemble, Jazz Lab Band, Marching Band.

**MUS\_ENS 8842. Choral Ensemble. 1 Credit.**

Research, preparation and performance of choral compositions. May be repeated for credit. Prerequisites: graduate standing, audition and instructor's consent. Sections are: University Singers, Chamber Singers, Choral Union, Vocal Jazz Ensemble, Concert Choral, Men's Chorus, Women's Chorus.

**MUS\_ENS 8843. Advanced Piano Ensemble. 1 Credit.**

Study, preparation and performance of standard piano literature for four hands. May be repeated for credit. Prerequisite: instructor's consent.

**MUS\_ENS 8846. Advanced Chamber Ensemble. 1 Credit.**

Study, preparation and performance of chamber music. May be repeated for credit. Prerequisites: audition and instructor's consent. Sections are: String Ensemble, Woodwind Ensemble, Brass Ensemble, Percussion Ensemble, Jazz Combo.

**MUS\_ENS 8865. Advanced Opera Workshop. 1-2 Credit.**

Study, preparation and performance of selected operatic or musical theatre works in staged or concert versions. Credit arranged; may be repeated for Credit. Prerequisite: audition and instructor's consent.

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## Music-General (MUS\_GENL)

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**MUS\_GENL 1091. Recital Attendance for Undergraduate Music Majors. 0 Credits.**

Required attendance of eleven music events from the Music Department listing. 0 credit, graded on S/U basis, and may be repeated until the total degree requirement is satisfactorily met. Undergraduate music majors only. No tuition charged.

**MUS\_GENL 3005. Topics in Music-Humanities. 1-99 Credit.**

Organized study of selected topics in music. Subjects and credit variable. May be repeated for additional credit with departmental consent. Prerequisites: junior standing in Music and instructor's consent.

**MUS\_GENL 3005H. Topics in Music-Humanities - Honors. 1-99 Credit.**

Organized study of selected topics in music. Subjects and credit variable. May be repeated for additional credit with departmental consent. Prerequisites: junior standing in Music and instructor's consent. Honors eligibility required.

**MUS\_GENL 3085. Problems in Music. 1-99 Credit.**

Independent investigation leading to a paper or project. May be repeated for credit. Prerequisite: instructor's consent. Sections are: Music Theory, Music Composition, Music History, Music Performance/Pedagogy.

**MUS\_GENL 4005. Topics in Music-Humanities. 1-99 Credit.**

Organized study of selected topics in music. Subjects and credit variable. May be repeated for additional credit with departmental consent. Prerequisites: junior standing in Music and instructor's consent.

**MUS\_GENL 4510. Career Development for Musicians. 1 Credit.**

Examination of professional opportunities available in the Creative Economy; development of a framework for career planning, professional portfolio, and personal business plan. Prerequisite: sophomore standing and instructor's consent.

**MUS\_GENL 7005. Topics in Music. 1-99 Credit.**

Organized study of selected topics in music. Subjects and credit variable. May be repeated with departmental consent. Prerequisites: graduate standing and departmental consent.

**MUS\_GENL 7510. Career Development for Musicians. 1 Credit.**

Examination of professional opportunities available in the Creative Economy; development of a framework for career planning, professional portfolio, and personal business plan. Prerequisite: instructor's consent.

**MUS\_GENL 8085. Problems in Music. 1-99 Credit.**

Independent investigation leading to a paper or project. May be repeated for credit. Prerequisite: instructor's consent. Sections are: Music Theory, Music Composition, Music History, Music Performance/Pedagogy.

**MUS\_GENL 8090. Research in Music. 1-99 Credit.**

Thesis course. May be repeated for additional credit. Graded on S/U basis only. Sections are: Music Theory, Music Composition, Music History, Performance/Pedagogy.

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## Music-Instrumental And Vocal Repertory (MUS\_I\_VR)

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**MUS\_I\_VR 3753. Piano Literature I. 2 Credits.**

Survey of keyboard music from ca. 1600 to ca. 1800. Prerequisites: junior standing and instructor's consent.

**MUS\_I\_VR 3754. Piano Literature II. 2 Credits.**

Survey of keyboard music from Beethoven's time to the present. Prerequisites: Music- Instrumental and Vocal Repertory [MUS\_I\_VR] 3753 or instructor's consent.

**MUS\_I\_VR 4767. Vocal Literature I. 2 Credits.**

Introduction to and study of song literature with emphasis on style and interpretation. Prerequisites: junior standing or instructor's consent.

**MUS\_I\_VR 4768. Vocal Literature II. 2 Credits.**

Continuation of Music-Instrumental and Vocal Repertory [MUS\_I\_VR] 4767. Prerequisites: MUS\_I\_VR 4767 or instructor's consent.

**MUS\_I\_VR 4776. Orchestral Excerpts. 1 Credit.**

Study and preparation of selected excerpts from the standard audition repertoire, culminating in a mock audition. May be repeated for credit. Instructor's consent required.

**MUS\_I\_VR 4780. Classical Guitar Repertory I. 1 Credit.**

Survey of guitar repertory and history from 1400 to present. Prerequisite: instructor's consent.

**MUS\_I\_VR 4781. Classical Guitar Repertory II. 1 Credit.**

Continued study of guitar repertory from 1400 to present, with emphasis on organological development of the guitar and performance practice. Prerequisite: Music - Instrumental and Vocal Repertory [MUS\_I\_VR] 4780; instructor's consent.

**MUS\_I\_VR 7767. Advanced Vocal Literature I. 3 Credits.**

Study of specific aspects of vocal repertory. Individual projects in research, analysis and performance. Prerequisites: Music - Applied Music [MUS\_APMS] 7455 or instructor's consent.

**MUS\_I\_VR 7768. Advanced Vocal Literature II. 3 Credits.**

Continuation of Music-Instrumental and Vocal Repertory [MUS\_I\_VR] 7767. Prerequisites: Music - Instrumental and Vocal Repertory [MUS\_I\_VR] 7767 or instructor's consent.

**MUS\_I\_VR 7776. Orchestral Excerpts. 1 Credit.**

Study and preparation of selected excerpts from the standard audition repertoire, culminating in a mock audition. Instructor's consent required. May be repeated for credit.

**MUS\_I\_VR 7780. Graduate Classical Guitar Repertory I. 1 Credit.**

Survey of guitar repertory and history from 1400 to present. Instructor's consent required.

**MUS\_I\_VR 7781. Graduate Classical Guitar Repertory II. 1 Credit.**

Continued study of guitar repertory from 1400 to present, with emphasis on organological development of the guitar and performance practice. Prerequisite: Music - Instrumental and Vocal Repertory [MUS\_I\_VR] 7780. Instructor's consent required.

**MUS\_I\_VR 8753. Piano Repertory I. 2 Credits.**

Study of specific aspects of Baroque and Classical keyboard music. Individual projects in research, analysis and performance. Prerequisites: Music - Applied Music [MUS\_APMS] 7455 or instructor's consent.

**MUS\_I\_VR 8754. Piano Repertory II. 2 Credits.**

Study of specific aspects of nineteenth- and twentieth century piano music. Individual projects in research, analysis and performance. Prerequisites: Music - Instrumental and Vocal Repertory [MUS\_I\_VR] 8753 or instructor's consent.

**MUS\_I\_VR 8765. Choral Repertory. 2 Credits.**

Survey of choral works from selected periods with an emphasis on various aspects of choral performance. May be repeated once for additional credit. Prerequisites: graduate standing and instructor's consent.

**MUS\_I\_VR 8770. Band Repertory. 3 Credits.**

To survey band and wind ensemble repertoire with emphasis on various aspects of performance practice in order to prepare the student for a career which includes conducting advanced high school and college bands and wind ensembles.

**MUS\_I\_VR 8773. String Instrument Repertory I. 1 Credit.**

Prerequisites: Music - Applied Music [MUS\_APMS] 7455 or instructor's consent.

**MUS\_I\_VR 8774. String Instrument Repertory II. 1 Credit.**

Continuation of Music-Instrumental and Vocal Repertory 8773. Prerequisite: Music -Instrumental and Vocal Repertory [MUS\_I\_VR] 8773.

**MUS\_I\_VR 8775. Orchestral Repertory. 2 Credits.**

A survey of orchestral repertory, emphasizing various aspects of performance practice. Appropriate for graduate music conducting majors who wish to pursue a career which includes conducting orchestras at the advanced high school, college, and professional levels. May be repeated. Prerequisite: Conducting experience at the high school or college level and instructor's consent.

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## Music-Instrumental And Vocal Techniques (MUS\_I\_VT)

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**MUS\_I\_VT 1610. Group Piano for Music Majors I. 1 Credit.**

Beginning piano for music majors and concentrations only. Prerequisite: instructor's consent.

**MUS\_I\_VT 1611. Group Piano for Music Majors II. 1 Credit.**

Continuation of 1610. Prerequisite: Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 1610 with a minimum grade of C- or instructor's consent.

**MUS\_I\_VT 1620. Jazz Piano Class. 1 Credit.**

Beginning piano technique and study of common jazz piano voicings for accompaniment and solo performance. Prerequisites: Music-Music Courses for Non-Majors [MUSIC\_NM] 1211 or Music - Music Theory [MUS\_THRY] 1220; instructor's consent required.

**MUS\_I\_VT 2610. Group Piano for Music Majors III. 1 Credit.**

Continuation of Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 1611. Prerequisite: MUS\_I\_VT 1611 with a minimum grade of C- or instructor's consent.

**MUS\_I\_VT 2611. Group Piano for Music Majors IV. 1 Credit.**

Continuation of Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 2610. Prerequisite: MUS\_I\_VT 2610 with a minimum grade of C- or instructor's consent.

**MUS\_I\_VT 2631. Basic Conducting and Score Reading. 2 Credits.**

To develop the basic psychomotor and score reading skills prerequisite to the art of conducting.

**MUS\_I\_VT 2632. Rehearsal Clinic: String Orchestra Conducting. 2 Credits.**

To develop musical and interpersonal skills requisite for successful rehearsal leadership, emphasizing strategies effective for rehearsal of string ensembles. Prerequisites: Grade of C- or better in Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 2631 and either 2640 or 2641; or instructor's consent.

**MUS\_I\_VT 2633. Rehearsal Clinic: Choral Conducting. 2 Credits.**

To develop musical and interpersonal skills requisite for successful leadership of a choral ensemble, emphasizing rehearsal strategies and repertoire. Prerequisite: Grade of C- or better in Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 2631 or instructor's consent. May be repeated once for credit.

**MUS\_I\_VT 2634. Rehearsal Clinic: Band Conducting. 1 Credit.**

To develop musical and interpersonal skills requisite for successful rehearsal leadership, emphasizing strategies effective for rehearsal of wind and percussion ensembles. Prerequisites: Grade of C- or better in Music- Instrumental and Vocal Techniques [MUS\_I\_VT] 2631 or instructor's consent. May be repeated for credit.

**MUS\_I\_VT 2637. Woodwinds I. 1 Credit.**

Class instruction in clarinet and saxophone; playing and methods/materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music or Music Education.

**MUS\_I\_VT 2638. Woodwinds II. 1 Credit.**

Class instruction in flute and double reeds; playing and methods/materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music or Music Education.

**MUS\_I\_VT 2640. Strings I. 1 Credit.**

Class instruction in violin and viola; playing and methods and materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music or Music Education.

**MUS\_I\_VT 2641. Strings II. 1 Credit.**

Class instruction in violoncello and string bass; playing and methods and materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music or Music Education.

**MUS\_I\_VT 2645. Brass I. 1 Credit.**

Class instruction in trumpet and horn; playing and methods/ materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music or Music Education.

**MUS\_I\_VT 2646. Brass II. 1 Credit.**

Class instruction in trombone, euphonium, and tuba; playing and methods/materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music or Music Education.

**MUS\_I\_VT 2648. Percussion. 1 Credit.**

Class instruction in percussion instruments; playing and methods and materials for teaching. Taught on a laboratory basis. Meets twice weekly. Prerequisite: major in Music Education.

**MUS\_I\_VT 2649. Percussion II. 1 Credit.**

Extension of Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 2648. Topics include marching percussion, drumset, Latin accessory instruments, and percussion ensemble literature. Prerequisite: MUS\_I\_VT 2648 or instructor's consent.

**MUS\_I\_VT 2661. Keyboard Skills for Piano Majors I. 2 Credits.**

Study of sightreading, harmonization, transposition, figured bass realization, and duet skills. Prerequisites: grade of C- or better in Music - Music Theory [MUS\_THRY] 1221 and 1231; instructor's consent.

**MUS\_I\_VT 2662. Keyboard Skills for Piano Majors II. 2 Credits.**

Study of score reading, duet performance, and collaborative experiences with voice and instruments. Prerequisites: grade of C- or better in Music - Instrumental and Vocal Techniques [MUS\_I\_VT] 2661; instructor's consent.

**MUS\_I\_VT 3640. Undergraduate Seminar in Vocal Techniques. 1 Credit.**

Discusses accepted techniques of singing, practical application to posture, breath support, tone placement, musicianship, diction, interpretation, stage deportment. Recognizing and solving specific vocal problems. May be repeated once for credit. Prerequisite: instructor's consent.

**MUS\_I\_VT 3642. Seminar in String Techniques. 1 Credit.**

In-depth study of publications, philosophies, repertory, grading, specific problems for the string player. May be repeated once for credit. Prerequisites: Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 2640 and 2641, or instructor's consent.

**MUS\_I\_VT 3643. Symposium in Instrumental Music. 2 Credits.**

Study of procedures, techniques and literature for variable combinations of wind, string, and percussion classes and the administration of instrumental music programs. Prerequisite: junior standing in Music or Music Education or instructor's consent.

**MUS\_I\_VT 3644. Jazz Methods and Materials. 1 Credit.**

Training and supervised practice in conducting Jazz Ensembles; study of administration, methods, and materials pertinent to teaching Jazz, Rock, and Commercial Music in high school and college. Prerequisites: junior standing or instructor's consent.

**MUS\_I\_VT 3646. Marching Band Techniques. 2 Credits.**

Study of techniques and procedures used in the development of field and street marching. Prerequisite: junior standing in Music or Music Education.

**MUS\_I\_VT 3670. Diction in Singing: Italian. 1 Credit.**

Study of the correct principles and application of Italian diction in singing the solo vocal, operatic and choral literature; the International phonetic alphabet; spoken language drill, study and recitation of representative literature. Prerequisite: sophomore standing.

**MUS\_I\_VT 3671. Diction in Singing: German. 1 Credit.**

Study of the correct principles and application of German diction in singing the solo vocal, operatic and choral literature; the International Phonetic Alphabet spoken language drill, study and recitation of representative literature. Prerequisite: sophomore standing.

**MUS\_I\_VT 3672. Diction in Singing: French. 1 Credit.**

Study of the correct principles and application of French diction in singing the solo vocal, operatic, and choral literature; the International Phonetic Alphabet spoken language drill, study and recitation of representative literature. Prerequisite: sophomore standing.

**MUS\_I\_VT 4645. Jazz Improvisation. 2 Credits.**

Creation of a melodic vocabulary for jazz improvisation through study and application of jazz chord-scale theory, solo transcription, and careful listening to the vanguard of jazz. Prerequisites: Music - Music for Non-Majors [MUSIC\_NM] 1211 or Music - Music Theory [MUS\_THRY] 1220, instructor's consent.

**MUS\_I\_VT 4661. Piano Pedagogy Survey I. 2 Credits.**

Study of approaches for teaching young beginning and intermediate student; survey of materials and resources. Prerequisite: instructor's consent.

**MUS\_I\_VT 4662. Piano Pedagogy Survey II. 2 Credits.**

Study of approaches for teaching older, more advanced and class piano students; survey of materials and resources. Prerequisite: instructor's consent.

**MUS\_I\_VT 4663. Piano Pedagogy Laboratory. 1 Credit.**

Supervised instruction in private and class piano . May be repeated once for additional credit. Prerequisites: Music-Instrumental and Vocal Techniques [MUS\_I\_VT] 4661 and 4662.

**MUS\_I\_VT 4680. Classical Guitar Pedagogy. 1 Credit.**

Basic anatomical and physiological aspects of guitar performance, setting technical and musical goals for students, repertoire development in

relation to age, level, and musical style. Career goals (building a private studio, lesson planning, organizational skills) are addressed. Prerequisite: Audition required and instructor's consent.

**MUS\_I\_VT 7645. Graduate Jazz Improvisation. 2 Credits.**

Creation of a melodic vocabulary for jazz improvisation through study and application of jazz chord-scale theory, solo transcription, and careful listening to the vanguard of jazz. Prerequisite: instructor's consent; graduate standing required.

**MUS\_I\_VT 7680. Graduate Classical Guitar Pedagogy. 1 Credit.**

Basic anatomical and physiological aspects of guitar performance, setting technical and musical goals for students, repertoire development in relation to age, level and musical style. Career goals (building a private studio, lesson planning, organizational skills) are addressed. Prerequisites: Audition and approval of instructor.

**MUS\_I\_VT 8646. Jazz Pedagogy I. 3 Credits.**

Study of historical and current trends in jazz education and pedagogy, including administration and curriculum, through assigned readings, supervised teaching, classroom discussion, survey of materials, and formation of an annotated bibliography. Graded on A-F basis only. Prerequisite: instructor's consent required.

**MUS\_I\_VT 8647. Jazz Pedagogy II. 3 Credits.**

Continuation of MUS\_I\_VT 8646; formulation of an extensive philosophy of jazz education. Graded A-F only. Prerequisite: MUS\_I\_VT 8646 and consent of instructor.

**MUS\_I\_VT 8671. Principles of Singing I. 2 Credits.**

Prerequisite: instructor's consent.

**MUS\_I\_VT 8673. Advanced Choral Conducting. 2 Credits.**

Advanced conducting techniques in the interpretation of choral literature; score analysis. May be repeated for additional credit. Prerequisites: Music - Instrumental and Vocal Techniques [MUS\_I\_VT] 2633 or instructor's consent.

**MUS\_I\_VT 8674. Advanced Instrumental Conducting. 2 Credits.**

Advanced conducting techniques in the interpretation of band and orchestral literature; score analysis. May be repeated for additional credit. Prerequisites: Music - Instrumental and Vocal Techniques [MUS\_I\_VT] 2634 or instructor's consent.

**MUS\_I\_VT 8681. Advanced Piano Pedagogy I. 2 Credits.**

A survey of materials and techniques of instruction for teaching the young beginner and the intermediate piano student. Prerequisites: graduate standing and instructor's consent.

**MUS\_I\_VT 8682. Advanced Piano Pedagogy II. 2 Credits.**

A survey of materials and techniques of instruction for teaching class piano, the older beginner, and the advanced student. Prerequisites: graduate standing and instructor's consent.

**MUS\_I\_VT 8683. Piano Pedagogy Internship. 1 Credit.**

Supervised teaching of individual and group lessons. Prerequisite: Music - Instrumental and Vocal Techniques [MUS\_I\_VT] 8681 and 8682 and instructor's consent. May be repeated once for credit.

**MUS\_I\_VT 8686. Choral Techniques. 3 Credits.**

Study of techniques for developing choral singing and musical interpretation. Prerequisites: graduate standing and instructor's consent.

**MUS\_I\_VT 8689. Band Techniques. 3 Credits.**

To develop individual conducting techniques as well as instrumental ensemble techniques. Emphasis is placed on the learning process to

give the student a perspective to improve the techniques of others. Prerequisites: graduate standing and instructor's consent.

## Music-Music History And Literature (MUS\_H\_LI)

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**MUS\_H\_LI 1322. Introduction to Music in the United States. 2 Credits.**

Historical overview of American folk, popular, and fine-art music; emphasis on listening skills.

**MUS\_H\_LI 2307. History of Western Music I. 2 Credits.**

Historical survey of selected European practices up to 1700 following a consideration of the major fine-art traditions of the world. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 1322.

**MUS\_H\_LI 2308. History of Western Music II. 2 Credits.**

Historical survey of Western fine-art music from approximately 1700 to the present. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2307.

**MUS\_H\_LI 4311. Historical Studies in Art Song. 3 Credits.**

Historical survey of works for solo voice and instruments. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4312. Historical Studies in Choral Music. 3 Credits.**

Historical survey of works featuring choral ensembles. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4313. Historical Studies in Opera. 3 Credits.**

Historical survey of opera. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4314. Historical Studies in Large Ensemble Music. 3 Credits.**

Historical survey of works for large instrumental ensembles. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4315. Historical Studies in Chamber Music. 3 Credits.**

Historical survey of works for small ensembles, instrumental and vocal. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4316. Historical Studies in Keyboard Music. 3 Credits.**

Historical survey of works for solo keyboard instruments. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4317. Historical Studies in Jazz and Popular Music. 3 Credits.**

Historical survey of works from the realm of American jazz and popular music. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4318. Studies in World Music. 3 Credits.**

Advanced systematic study of musical activities in selected world cultures, with the emphasis on developing listening skills and understanding the role of music in a culture. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2307 and 2308.

**MUS\_H\_LI 4320. Historical Studies in African-American Music. 3 Credits.**

Exploration of history and current scholarship in African-American music from the eighteenth to twenty-first centuries. Genres include folk music, religious music, blues, ragtime, jazz, musical theater, art music, R&B, funk, soul, disco, house, hip-hop and rap. Prerequisites: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and Instructor's consent.

**MUS\_H\_LI 4335. Music of the Middle Ages and the Renaissance. 3 Credits.**

Systematic study of European musical practice before 1600. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4336. Music in the Baroque Era. 3 Credits.**

Systematic study of European musical practice from approximately 1600 to 1750. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4337. Music of the Classic Era. 3 Credits.**

Systematic study of European musical practice from approximately 1750 to 1800. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4338. Music of the Romantic Era. 3 Credits.**

Systematic study of European musical practice from approximately 1800 to 1900. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4339. Music of the Modern Era. 3 Credits.**

Systematic study of fine-art musical practice from approximately 1900 to the present. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and/or instructor's consent.

**MUS\_H\_LI 4340. Focal Composers. 3 Credits.**

Systematic study of the works of landmark composers: J.S. Bach, Mozart, Beethoven, Verdi/Wagner, Debussy, or Stravinsky, studied in rotation. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent. Repeatable for up to 6 hours or credit.

**MUS\_H\_LI 4341. Advanced Studies in American Music. 3 Credits.**

Systematic study of the diverse streams of musical practice in the United States from the colonial time to the present. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4342. Contemporary Issues in Musicology. 3 Credits.**

Systematic study of single musicological problem of contemporary relevance. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308 and instructor's consent.

**MUS\_H\_LI 4350. Introduction to Ethnomusicology. 3 Credits.**

Study of theories, historical development, research methodologies, and practice of ethnomusicology, in an interdisciplinary approach. Topics include ethnographic research, oral and literate sources, transcription and analysis, critical analysis, and interpretative techniques. Prerequisites: grade of C- or better in Music - Courses for Non Majors [MUSIC\_NM] 2308; instructor's consent.

**MUS\_H\_LI 4352. Historical Studies in African Music. 3 Credits.**

Ethnomusicological introduction to the music and culture of countries and ethnic groups in Africa. Traditional and contemporary popular styles are explored, and influences of Islamic invasions, missionary arrivals, colonial conquests, neo-colonial trends, and globalization. Prerequisite: grade

of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2308; instructor's consent.

**MUS\_H\_LI 4376. American Musicals. 3 Credits.**

(same as Theatre [THEATR] 4720). Historical survey of the development of the 20th-Century American Musical in Theatre and Film.

**MUS\_H\_LI 4397. Honors in Music History I. 3 Credits.**

Special readings, directed research for graduation with Honors in music history. Prerequisites: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 2307 and 2308.

**MUS\_H\_LI 4398. Honors in Music History II. 3 Credits.**

Continuation of Music History and Literature 4397 leading to Honors thesis in music history. Prerequisite: Grade of C- or better in Music-Music History and Literature [MUS\_H\_LI] 4397.

**MUS\_H\_LI 4399. Graduate History Review. 2 Credits.**

Review of history for graduate students. Does not fulfil graduate degree requirements. Prerequisites: graduate standing required; instructor's consent. Graded on S/U basis only.

**MUS\_H\_LI 7307. Graduate Review of Music History I. 2 Credits.**

Survey of the history of Western music from ca. 600 A.D. to ca. 1750. Special readings; individual projects.

**MUS\_H\_LI 7308. Graduate Review of Music History II. 2 Credits.**

Survey of the history of Western music from ca. 1750 to the present. Special readings; individual projects.

**MUS\_H\_LI 7311. Historical Studies in Art Song. 3 Credits.**

Advanced historical survey of works for solo voice and instruments. Prerequisite: instructor's consent.

**MUS\_H\_LI 7312. Historical Studies in Choral Music. 3 Credits.**

Advanced historical survey of works featuring choral ensembles. Prerequisite: instructor's consent.

**MUS\_H\_LI 7313. Historical Studies in Opera. 3 Credits.**

Advanced historical survey of opera. Prerequisite: instructor's consent.

**MUS\_H\_LI 7314. Historical Studies in Large Ensemble Music. 3 Credits.**

Advanced historical survey of works for large instrumental ensembles. Prerequisite: instructor's consent.

**MUS\_H\_LI 7315. Historical Studies in Chamber Music. 3 Credits.**

Advanced historical survey of works for small ensembles, instrumental and vocal. Prerequisite: instructor's consent.

**MUS\_H\_LI 7316. Historical Studies in Keyboard Music. 3 Credits.**

Advanced historical survey of works for solo keyboard instruments. Prerequisite: instructor's consent.

**MUS\_H\_LI 7317. Historical Studies in Jazz and Popular Music. 3 Credits.**

Advanced historical survey of works from the realm of American jazz and popular music. Prerequisite: instructor's consent.

**MUS\_H\_LI 7318. Studies in World Music. 3 Credits.**

Advanced systematic study of musical activities in selected world cultures, with emphasis on developing listening skills and understanding the role of music in a culture. Prerequisite: instructor's consent.

**MUS\_H\_LI 7320. Historical Studies in African-American Music. 3 Credits.**

Exploration of history and current scholarship in African-American music from the eighteenth to the twenty-first centuries. Genres include folk

music, religious music, blues, ragtime, jazz, musical theater, art music, R&B, funk, soul, disco, house, hip-hop and rap. Instructor's consent required.

**MUS\_H\_LI 7335. Music of the Middle Ages and the Renaissance. 3 Credits.**

Advanced systematic study of European musical practice before 1600. Prerequisite: instructor's consent.

**MUS\_H\_LI 7336. Music in the Baroque Era. 3 Credits.**

Advanced systematic study of European musical practice from approximately 1600 to 1750. Prerequisite: instructor's consent.

**MUS\_H\_LI 7337. Music of the Classic Era. 3 Credits.**

Advanced systematic study of European musical practice from approximately 1750 to 1800. Prerequisite: instructor's consent.

**MUS\_H\_LI 7338. Music of the Romantic Era. 3 Credits.**

Advanced systematic study of European musical practice from approximately 1800 to 1900. Prerequisite: instructor's consent.

**MUS\_H\_LI 7339. Music of the Modern Era. 3 Credits.**

Advanced systematic study of fine-art musical practice from approximately 1900 to the present. Prerequisite: instructor's consent.

**MUS\_H\_LI 7340. Focal Composers. 3 Credits.**

Advanced systematic study of the works of landmark composers: J.S. Bach, Mozart, Beethoven, Verdi/Wagner, Debussy, or Stravinsky, studied in rotation. Prerequisite: instructor's consent. Repeatable for up to 6 hours or credit.

**MUS\_H\_LI 7341. Advanced Studies in American Music. 3 Credits.**

Advanced systematic study of the diverse streams of musical practice in the United States from the colonial time to the present. Prerequisite: instructor's consent.

**MUS\_H\_LI 7342. Contemporary Issues in Musicology. 3 Credits.**

Advanced systematic study of single musicological problem of contemporary relevance. Prerequisite: instructor's consent.

**MUS\_H\_LI 7350. Introduction to Ethnomusicology. 3 Credits.**

Study of theories, historical development, research methodologies, and practice of ethnomusicology, in an interdisciplinary approach. Topics include ethnographic research, oral and literate sources, transcription and analysis, critical analysis, and interpretative techniques. Instructor's consent required.

**MUS\_H\_LI 8313. Introduction to Graduate Study. 2 Credits.**

Introduction to library procedures, basic sources of information in music and techniques for research. Prerequisite: instructor's consent.

**MUS\_H\_LI 8314. Introduction to Graduate Studies in Music II. 1 Credit.**

The application of basic music bibliography, research techniques, and conventions of music scholarship. Prerequisite: Music - History and Literature [MUS\_H\_LI] 8313 or instructor's consent.

## **Music-Music Theory (MUS\_THRY)**

**MUS\_THRY 1210. Introduction to Computer Technology and Music. 2 Credits.**

Introduces Finale, music engraving and playback software, and introduces sequencing and other software applications that may impact students while they are in school and as professional musicians.

**MUS\_THRY 1213. Introduction to Music Theory. 2 Credits.**

Introduction to music notation and to rhythmic, melodic, harmonic, and structural elements of music. Emphasis on written skills, but ear training, sight singing, and keyboard components included as well. Prerequisite: consent required. Placement by exam. Graded on A/F basis only.

**MUS\_THRY 1220. Syntax, Structure and Style of Music I. 2 Credits.**

Review of fundamentals. Study of rhythm, melody, harmonic, structure and stylistic characteristics of various periods. Application through original composition projects. Prerequisites: none for Music majors; others: instructor's consent.

**MUS\_THRY 1221. Syntax, Structure and Style of Music II. 2 Credits.**

Continuation of Music Theory [MUS\_THRY]1220. Study of smaller forms and introduction to chromatic harmony. Prerequisites: Grade of C- or better in MUS\_THRY 1220 or instructor's consent.

**MUS\_THRY 1230. Aural Training and Sight Singing I. 2 Credits.**

Development of aural and sight singing skills. Prerequisite or concurrent registration: Music-Music Theory [MUS\_THRY] 1220.

**MUS\_THRY 1231. Aural Training and Sight Singing II. 2 Credits.**

Continuation of Music Theory 1230. Prerequisite: Grade of C- or better in Music-Music Theory [MUS\_THRY] 1230 and 1221 or 1221 concurrently.

**MUS\_THRY 2215. Composition I. 2 Credits.**

Fundamentals of composition and writing in small forms. Prerequisites: grade of B- or better in Music Theory [MUS\_THRY] 1220, 1221, 1230, 1231, and instructor's consent.

**MUS\_THRY 2216. Composition II. 2 Credits.**

Continuation of Music Theory [MUS\_THRY] 2215. Prerequisite: Grade of C- or better in MUS\_THRY 2215.

**MUS\_THRY 2220. Syntax, Structure and Style of Music III. 2 Credits.**

Chromatic harmony, variation techniques and contrapuntal genres. Study of traditional forms in instrumental, vocal and choral compositions. Applications through original composition projects. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 1221.

**MUS\_THRY 2221. Syntax, Structure and Style of Music IV. 2 Credits.**

Continued study of chromatic harmony and compositions in larger forms. Application through original composition projects. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2220.

**MUS\_THRY 2230. Aural Training and Sight Singing III. 2 Credits.**

Continuation of Music Theory [MUS\_THRY] 1231. Further development of aural and sight singing skills with an emphasis on chromatic harmony and decorative pitches. Introduction of structural perception. Prerequisites: Grade of C- or better in MUS\_THRY 1231 and 2220 or 2220 concurrently.

**MUS\_THRY 2231. Aural Training and Sight Singing IV. 2 Credits.**

Continuation Music Theory [MUS\_THRY] 2230. Prerequisites: Grade of C- or better in MUS\_THRY 2230 and 22210 or 2221 concurrently.

**MUS\_THRY 3215. Composition III. 2 Credits.**

Further development of creative writing in traditional forms. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2216.

**MUS\_THRY 3216. Composition IV. 2 Credits.**

Continuation of Music Theory [MUS\_THRY] 3215. Prerequisite: Grade of C- or better in MUS\_THRY 3215.

**MUS\_THRY 4210. Jazz Harmony and Arranging I. 2 Credits.**

Study of basic melodic and harmonic materials commonly used in jazz. Application through arranging projects for small jazz groups.

Prerequisites: Music Theory [MUS\_THRY] 1211 or 1220; instructor's consent required.

**MUS\_THRY 4211. Jazz Harmony and Arranging II. 2 Credits.**

Continuation of 4210. Study of advanced melodic and harmonic materials commonly used in jazz. Application through arranging projects for small and large jazz groups. Prerequisites: Music-Music Theory [MUS\_THRY] 4210; instructor's consent.

**MUS\_THRY 4215. Composition V. 2 Credits.**

Writing of works in larger forms for a solo instrument or chamber ensemble. Prerequisite: Grade of C- or better in Music-Music Theory [MUS\_THRY] 3216.

**MUS\_THRY 4216. Composition VI. 2 Credits.**

Continuation of Music-Music Theory [MUS\_THRY] 4215. May be repeated for additional credit. Prerequisite: Grade of C- or better in MUS\_THRY 4215.

**MUS\_THRY 4220. 20th Century Composition Techniques. 2 Credits.**

The study and application of analytical procedures to 20th century music literature. Special readings; individual projects. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221 or instructor's consent.

**MUS\_THRY 4221. Analysis of Music. 2 Credits.**

An analytical study of rhythmic, melodic, harmonic and structural aspects of 18th-, 19th- and 20th-century music. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221 or equivalent.

**MUS\_THRY 4222. Computer Technology and Music. 2 Credits.**

The introduction of music software for educational and professional use. Music notation software will be learned. Sequencing software will be studied in depth. Hands-on experience with Macintosh computers, multi-timbral synthesizers and various CD-ROMS. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 4220 or instructor's consent.

**MUS\_THRY 4223. Eighteenth-Century Counterpoint. 3 Credits.**

Study of contrapuntal procedures and representative works of the eighteenth century. Emphasis on compositions and style of Johann Sebastian Bach. Original composition projects: canon, invention, and fugue. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221 or instructor's consent.

**MUS\_THRY 4225. Sixteenth-Century Counterpoint. 3 Credits.**

Analysis of contrapuntal procedures and representative compositions of 16th century. Emphasis on styles of Palestrina, Lassus and Victoria. Stylistic writing in two, three or more voices. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4227. Orchestration. 2 Credits.**

Study of orchestral instruments and the process of scoring for various orchestral combinations. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4229. Band Arranging. 2 Credits.**

Transcription, scoring of solo and ensemble literature for band instrument combinations of varying sizes up to and including concert band. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4230. Choral Arranging. 2 Credits.**

Transcription and arrangement of music suitable for performance by various vocal ensembles. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4231. Schenkerian Analysis. 3 Credits.**

Techniques of musical analysis developed by Heinrich Schenker. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4232. Rhythmic Analysis of Tonal Music. 3 Credits.**

Introduction to rhythmic analysis, including context of current thinking, basic concepts, various approaches, selected topics, performance issues, and particular problems. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4233. Acoustics of Music. 2 Credits.**

The study of tuning systems and the properties, production and reception of musical sound. Prerequisites: instructor's consent.

**MUS\_THRY 4245. Introduction to Electronic Music. 2 Credits.**

Techniques used in the creation of music with tape recorders, voltage-controlled synthesizers and electronics. Prerequisites: Grade of C- or better in Music-Music Theory [MUS\_THRY] 4220 or instructor's consent.

**MUS\_THRY 4247. Introduction to Digital Synthesis. 2 Credits.**

Introduction to the techniques of digital synthesis, including the study of programming, and Musical Instrument Digital Interfacing. Prerequisite: instructor's consent.

**MUS\_THRY 4250. Analysis of Musical Styles. 2 Credits.**

Analytical study of specific rhythmic, melodic, harmonic, and structural factors which constitute the stylistic practices of a specific period or composer. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 4221 or equivalent. Departmental consent for repetition.

**MUS\_THRY 4252. Keyboard Harmony and Score Reading. 3 Credits.**

Study of idiomatic chord progressions and harmonization strategies at the keyboard, including figured bass, score reading, and score playing. Skills are reinforced by analysis, both at sight and prepared. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221; instructor's consent.

**MUS\_THRY 4267. Advanced Orchestration I. 2 Credits.**

Transcription for full orchestra of large works from different style periods. Scoring of original works for orchestra. Seminar, private lessons. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 4227.

**MUS\_THRY 4268. Advanced Orchestration II. 2 Credits.**

Survey of original works for orchestra.

**MUS\_THRY 4271. Pedagogy of Music Theory I. 2 Credits.**

Techniques and materials for teaching basic music theory courses for high schools and colleges. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4272. Pedagogy of Music Theory II. 2 Credits.**

Techniques and materials for advanced college courses in music theory. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 4271.

**MUS\_THRY 4284. Contemporary Analytical Techniques. 2 Credits.**

Study and application of various analytical systems for 20th century compositions. Analysis of music employing contemporary theories. Prerequisite: Grade of C- or better in Music Theory [MUS\_THRY] 2221.

**MUS\_THRY 4299. Graduate Theory Review. 2 Credits.**

Review of music theory for graduate students in music. Does not fulfill graduate degree requirements. Prerequisites: graduate standing required; instructor's consent. Graded on S/U basis only.

**MUS\_THRY 7210. Advanced Jazz Harmony and Arranging I. 2 Credits.**

Study of basic melodic and harmonic materials commonly used in jazz. Application through arranging projects for small jazz groups. Prerequisite: graduate standing; instructor's consent.

**MUS\_THRY 7211. Advanced Jazz Harmony and Arranging II. 2 Credits.**

Continuation of Music - Music Theory [MUS\_THRY] 7210. Study of advanced melodic and harmonic materials commonly used in jazz. Application through arranging projects for small and large groups. Prerequisites: graduate standing; instructor's consent.

**MUS\_THRY 7215. Composition I. 2 Credits.**

Fundamentals of Composition: Writing in small forms. For non-composition graduate students in music. Prerequisite: instructor's consent.

**MUS\_THRY 7216. Composition II. 2 Credits.**

Continuation of Music - Music Theory [MUS\_THRY] 7215. Prerequisite: Music - Music Theory [MUS\_THRY] 7215.

**MUS\_THRY 7220. 20th Century Composition Techniques. 2 Credits.**

Graduate review in the study and application of analytical procedures to 20th century music literature. Special readings; individual projects. Prerequisite: instructor's consent.

**MUS\_THRY 7221. Analysis of Music. 2 Credits.**

Graduate review in the analytical study of rhythmic, melodic, harmonic and structural aspects of 18th-, 19th- and 20th-century music. Prerequisite: instructor's consent.

**MUS\_THRY 7222. Computer Technology and Music. 2 Credits.**

Graduate-level introduction of music software for educational and professional use. Music notation software will be learned. Sequencing software will be studied in depth. Hands-on experience with Macintosh computers, multi-timbral synthesizers and various CD-ROMS. Prerequisite: instructor's consent.

**MUS\_THRY 7223. Eighteenth-Century Counterpoint. 3 Credits.**

Advanced study of contrapuntal procedures and representative works of the eighteenth century. Emphasis on compositions and style of Johann Sebastian Bach. Original composition projects: canon, invention, and fugue. Prerequisite: instructor's consent.

**MUS\_THRY 7225. Sixteenth-Century Counterpoint. 3 Credits.**

Advanced analysis of contrapuntal procedures and representative compositions of 16th century. Emphasis on styles of Palestrina, Lassus and Victoria. Stylistic writing in two, three or more voices. Prerequisite: instructor's consent.

**MUS\_THRY 7227. Advanced Orchestration. 2 Credits.**

Study of orchestral instruments and the process of scoring for various orchestral combinations. Prerequisite: instructor's consent.

**MUS\_THRY 7229. Band Arranging. 2 Credits.**

Advanced transcription, scoring of solo and ensemble literature for band instrument combinations of varying sizes up to and including concert band. Prerequisite: instructor's consent.

**MUS\_THRY 7230. Choral Arranging. 2 Credits.**

Advanced transcription and arrangement of music suitable for performance by various vocal ensembles. Prerequisite: instructor's consent.

**MUS\_THRY 7231. Schenkerian Analysis. 3 Credits.**

Advanced techniques of musical analysis developed by Heinrich Schenker. Prerequisite: instructor's consent.

**MUS\_THRY 7232. Rhythmic Analysis of Tonal Music. 3 Credits.**

Advanced study of rhythmic analysis, including context of current thinking, basic concepts, various approaches, selected topics,

performance issues, and particular problems. Prerequisite: instructor's consent.

**MUS\_THRY 7233. Acoustics of Music. 2 Credits.**

Advanced study of tuning systems and the properties, production and reception of musical sound. Prerequisites: instructor's consent.

**MUS\_THRY 7245. Introduction to Electronic Music. 2 Credits.**

Advanced techniques used in the creation of music with tape recorders, voltage-controlled synthesizers and electronics. Prerequisites: instructor's consent.

**MUS\_THRY 7247. Introduction to Digital Synthesis. 2 Credits.**

Graduate-level introduction to the techniques of digital synthesis, including the study of programming, and Musical Instrument Digital Interfacing. Prerequisite: instructor's consent.

**MUS\_THRY 7250. Analysis of Musical Styles. 2 Credits.**

Advanced analytical study of specific rhythmic, melodic, harmonic, and structural factors which constitute the stylistic practices of a specific period or composer. Prerequisite: instructor's consent. Departmental consent for repetition.

**MUS\_THRY 7252. Keyboard Harmony and Score Reading. 3 Credits.**

Study of idiomatic chord progressions and harmonization strategies at the keyboard, including figured bass, score reading, and score playing. Skills are reinforced by analysis, both at sight and prepared. Prerequisite: demonstrable keyboard proficiency at level of Bach invention; graduate standing; instructor's consent.

**MUS\_THRY 7267. Advanced Orchestration I. 2 Credits.**

Advanced transcription for full orchestra of large works from different style periods. Scoring of original works for orchestra. Seminar, private lessons. Prerequisite: Music - Music Theory [MUS\_THRY] 7227 or instructor's consent.

**MUS\_THRY 7268. Advanced Orchestration II. 2 Credits.**

Survey of original works for orchestra. Prerequisite: graduate standing.

**MUS\_THRY 7271. Pedagogy of Music Theory I. 2 Credits.**

Advanced techniques and materials for teaching basic music theory courses for high schools and colleges. Prerequisite: instructor's consent.

**MUS\_THRY 7272. Pedagogy of Music Theory II. 2 Credits.**

Advanced techniques and materials for advanced college courses in music theory. Prerequisite: Music - Music Theory [MUS\_THRY] 7271.

**MUS\_THRY 7284. Contemporary Analytical Techniques. 2 Credits.**

Advanced study and application of various analytical systems for 20th century compositions. Analysis of music employing contemporary theories. Prerequisite: instructor's consent.

**MUS\_THRY 8215. Composition VII. 2 Credits.**

Intensive work in larger forms. Seminar, private lessons. Prerequisites: instructor's consent. Departmental consent for repetition.

## Natural Resources (NAT\_R)

**NAT\_R 1040. Conservation Studies. 1 Credit.**

A one-week field experience in natural resource management issues—soil and water conservation, air pollution, fish and wildlife habitat requirements, importance of forest ecosystems. Limited to high school students who have completed their junior year and taken the PSAT or equivalent. Graded on S/U basis only.



**NAT\_R 1060. Ecology and Conservation of Living Resources. 3 Credits.**

Introduction to the principles of resource and conservation describing the foundation of the variety of living resources and conservation practices used to protect and maintain these resources.

**NAT\_R 1070. Ecology and Renewable Resource Management. 3 Credits.**

Introduction to ecological principles and their relationship to resource use and management. Introduces fisheries and wildlife management as a profession. Required for Fisheries and Wildlife and Forestry majors.

**NAT\_R 2002. Topics in Natural Resources - Biological/Physical/Mathematical. 1-99 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester.

**NAT\_R 2004. Topics in Natural Resources - Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and credit may vary from semester to semester.

**NAT\_R 2160. Contemporary Issues in Natural Resources. 3 Credits.**

Natural resources, their management, renewability, and sustainability. Discussion of contemporary issues.

**NAT\_R 3001. Topics in Natural Resources. 1-99 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester.

**NAT\_R 3110. Natural Resource Biometrics. 3 Credits.**

Sampling methods and analysis as applied to a variety of natural resources, including fisheries, range, recreation, forests, water and wildlife. Prerequisites: a course in Statistics or instructor's consent.

**NAT\_R 3220. Public Relations for Natural Resource Managers. 3 Credits.**

Introduction to the practical nature of public relations for those entering natural resources careers, emphasis on communication with target audiences through news media, publications and exhibits.

**NAT\_R 3290. Hydrologic Measurement Techniques. 1 Credit.**

Students will be introduced to field methods and tools used by water resource and environmental science professionals. Students will sample and measure hydrologic and environmental variables, learn about data storage systems, and access and analyze data. Prerequisite: Mathematics [MATH] 1100 or permission of instructor. Graded on A/F basis only. Course may be repeated for credit.

**NAT\_R 4000. Problems in Natural Resources. 1-99 Credit.**

Problems in Natural Resources.

**NAT\_R 4001. Topics in Natural Resources. 1-99 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester.

**NAT\_R 4320. Hydrologic and Water Quality Modeling. 3 Credits.**

(same as Environmental Science [ENV\_SC] 4320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on watersheds to provide experience with the use of simulation models for natural resource decision making. Prerequisites: ENV\_SC 1100 or Soil Science [SOIL] 2100 or equivalent.

**NAT\_R 4325. Introduction to Geographic Information Systems. 3 Credits.**

The course will cover basic theoretical and technical issues in GIS, discuss processing geographic information for research and application,

emphasis on the nature of spatial information, data models, input, manipulation and storage, and spatial analytic techniques. Prerequisites: Natural Resources [NAT\_R] 1070 or Geography [GEOG] 2840; NAT\_R 1080 and 1090; instructor's consent.

**NAT\_R 4353. Natural Resource Policy/Administration. 3 Credits.**

Principles of policy formation and analysis; relationship of organizational goals to structure, planning and budgeting. Historical background of present natural resource policies; examines current policy issues. Prerequisites: senior standing or instructor's consent.

**NAT\_R 4365. GIS Applications. 3 Credits.**

Introduces logical thinking and techniques in applying GIS to practical problems. Covers general GIS functionalities, Arc View Spatial Analyst including georeference, terrain analysis, hydrological analysis, grid, and remote sensing image processing. Prerequisite: Geography [GEOG] 4840, Natural Resources [NAT\_R] 1080 and 1090, or instructor's consent.

**NAT\_R 4385. Landscape Ecology and GIS Analysis I. 3 Credits.**

(same as Geography [GEOG] 4810). Examination of the landscape-scale approach to biodiversity, ecosystem dynamics, and habitat management. Particular emphasis on the use of Geographic Information Systems to analyze the spatial dimension of ecological patterns and processes. Prerequisite: GEOG 4840, or instructor's consent.

**NAT\_R 4940. Natural Resources Internship. 1-12 Credit.**

Supervised professional experience with an approved public or private organization. Prerequisite: School of Natural Resources majors only, instructor's consent. Graded on S/U basis only. May be repeated for credit.

**NAT\_R 4970. Resource Practicum in Natural Resources. 3 Credits.**

Multidisciplinary planning of a natural resource management program. School of Natural Resources majors only. Prerequisite: senior standing or instructor's consent.

**NAT\_R 7001. Topics in Natural Resources. 1-99 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester.

**NAT\_R 7320. Hydrologic and Water Quality Modeling. 3 Credits.**

(same as Environmental Sciences [ENV\_SC] 7320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on Missouri watersheds to provide experience with the use of simulation models for natural resource decision making. Prerequisites: graduate standing and Natural Resources [NAT\_R] 1080 and 1090 and Soil Science [SOIL] 2100 or equivalent.

**NAT\_R 7325. Introduction to Geographic Information Systems. 3 Credits.**

The course will cover basic theoretical and technical issues in GIS, discuss processing geographic information for research and application, emphasis on the nature of spatial information, data models, input, manipulation and storage, and spatial analytic techniques. Prerequisites: graduate standing and Natural Resources [NAT\_R] 1070 or Geography [GEOG] 2840; NAT\_R 1080 and 1090; instructor's consent.

**NAT\_R 7353. Natural Resource Policy/Administration. 3 Credits.**

Principles of policy formation and analysis; relationship of organizational goals to structure, planning and budgeting. Historical background of present natural resource policies; examines current policy issues. Prerequisites: graduate standing or instructor's consent.

**NAT\_R 7365. GIS Applications. 3 Credits.**

Introduces logical thinking and techniques in applying GIS to practical problems. Cover general GIS functionalities, Arc View Spatial Analyst including georeference, terrain analysis, hydrological analysis, grid, and remote sensing image processing. Prerequisite: graduate standing and Geography [GEOG] 4840, Natural Resources [NAT\_R] 1080 and 1090, or instructor's consent.

**NAT\_R 7385. Landscape Ecology and GIS Analysis I. 3 Credits.**

(same as Geography [GEOG] 7810). Examination of the landscape-scale approach to biodiversity, ecosystem dynamics, and habitat management. Particular emphasis on the use of Geographic Information Systems to analyze the spatial dimension of ecological patterns and processes. Prerequisite: graduate standing and GEOG 4840, or instructor's consent.

**NAT\_R 8001. Topics in Natural Resources. 1-99 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester.

**NAT\_R 8290. Hydrologic Measurement and Synthesis. 2 Credits.**

Students are introduced to methods fundamental to measuring hydrologic processes, and assessing physical data, including field measurement, and data logging and acquisition information systems. Students will gain experience analyzing and synthesizing hydrologic data using tools commonly used by water resource professionals. May be repeated for credit. Prerequisites: Mathematics [MATH] 1100, Statistics [STAT] 2530, Physics [PHYSICS] 1210. If deficient in prerequisite courses, or unsure of qualification, contact instructor for consent. Graded on A/F basis only.

**NAT\_R 8395. Landscape Ecology and GIS Analysis II. 3 Credits.**

(same as Geography [GEOG] 8815). Provide students with principles and applications of landscape ecology and firm understandings of spatial analysis techniques using GIS. Discuss metrics for spatial pattern and models for landscape-scale dynamics. Prerequisite: graduate standing and Natural Resources [NAT\_R] 4365; Forestry [FOREST] 4320 or equivalent; basic statistics; GEOG 4810/7810 recommended; instructor's consent.

**NAT\_R 8416. Applied Research Methodology. 2 Credits.**

Interrelated roles or logic, observation experiment in scientific method, research components, ethical aspects, scientific publication and communication, and research direction. Prerequisite: instructor's consent.

**NAT\_R 8448. Society and Ecosystems Research Seminar. 3 Credits.**

(same as Agricultural Economics [AG\_EC] 8448 and Rural Sociology [RU\_SOC] 8448). This seminar, capstone for the Graduate Certificate Program in Society and Ecosystems, exposes students to interdisciplinary research on interactions between social, economic and ecological systems.

## Naval Science (NAVY)

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**NAVY 1100. Introduction to Naval Science. 3 Credits.**

This course serves as an introduction to the organization of the Naval Service, the varied career opportunities available, the long held customs and traditions of the service, and the duties of a Junior Officer.

**NAVY 1200. Seapower and Maritime Affairs. 3 Credits.**

Seminars examine the application of seapower as an instrument of foreign policy by the major nations of the world. Emphasis placed on role of the Navy.

**NAVY 2110. Naval Ship Systems I. 3 Credits.**

Ship construction, stability and damage control, basic thermodynamics, the steam cycle and engineering plant, including introduction to gas turbine, diesel and nuclear powered systems.

**NAVY 2130. Evolution of Warfare. 3 Credits.**

Evolution of strategy, tactics, weapons and leadership from earliest beginning through the Vietnam period. Development of military policy, the impact of warfare on the political, social and economic structure of nations.

**NAVY 2210. Naval Ship Systems II. 3 Credits.**

Naval weapons systems, their employment and control, including the basic fire control problem, with emphasis on new systems.

**NAVY 3120. Marine Navigation. 3 Credits.**

Theoretical and practical application of the principles of marine navigation. Includes fundamentals of dead reckoning, piloting, tides and current, celestial navigation, electronic navigation.

**NAVY 3130. Amphibious Warfare. 3 Credits.**

History and development of amphibious warfare, principles of amphibious warfare techniques; their application in selected examples from modern.

**NAVY 3140. Leadership and Management. 3 Credits.**

This course will provide a basic understanding of the interrelationship between authority, responsibility and accountability within a task oriented organization. Students will learn to apply leadership and management skills to prioritize competing demands and to attain mission objectives; the importance of planning and follow-up; and develop a basic understanding of communication and counseling as it pertains to personnel management. Prerequisites: sophomore standing or by consent of Professor of Naval Science.

**NAVY 3220. Naval Operations. 3 Credits.**

Principles and concepts of naval operations: rules of the road, command and control in naval operations, communications, ASW warfare, international maritime law, and practical solution of relative motion problems. Prerequisite: Naval Science [NAVY] 3120.

**NAVY 4940. Leadership and Ethics. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4940). The curriculum provides a foundation in leadership, ethical decision making, the Law of Armed Conflict and the military justice system. Course explores ethical theories and helps students to build an ethical framework for decision making. Topic areas include: Kant, Utilitarianism, Stoicism, Constitutional Paradigm, Uniform Code of Military Justice and Law of Armed Conflict. Designed as a capstone course for juniors and seniors enrolled in NROTC it is open to all MU students. Prerequisite: junior standing.

## Neurology (NEUROL)

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**NEUROL 6003. Neurology Clerkship. 2-3 Credit.**

Neurology Clerkship.

**NEUROL 6013. Rural Neurology Clerkship. 2 Credits.**

Rural Neurology Clerkship.

**NEUROL 6103. Remediation 6003 Neurology Clerkship. 2 Credits.**

Neurology Clerkship Remediation. Prerequisite: 6003 Neurology Clerkship, received unsatisfactory grade.

**NEUROL 6301. ABS Neurology Mech of Disease. 5-10 Credit.**

ABS Neurology Mech of Disease.

**NEUROL 6303. ABS Neurology Research. 5 Credits.**

ABS Neurology Research.

**NEUROL 6305. ABS Neurology Research and Review. 5 Credits.**

ABS Neurology Research and Review.

**NEUROL 6755. Adult Neurology - Rural. 5 Credits.**

Adult Neurology - Rural.

**NEUROL 6756. Neurology - Rural. 5 Credits.**

Rural Neurology general elective. Prerequisites: Neurology [NEUROL] 6002, 6003. Restricted to fourth year medical students.

**NEUROL 6829. PEDIATRIC NEUROLOGY. 5 Credits.**

Pediatric Neurology.

**NEUROL 6845. Neurology. 5 Credits.**

Neurology.

**NEUROL 6850. Advanced Neurology. 5 Credits.**

Advanced Neurology.

## **Nuclear Engineering (NU\_ENG)**

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**NU\_ENG 2201. Topics in Nuclear Engineering. 3 Credits.**

Current and new developments in nuclear engineering. Prerequisites: sophomore standing; Physics [PHYSICS] 1210 and 1220 and Mathematics [MATH] 1100 or 1120 or instructor's consent.

**NU\_ENG 2303. Harnessing the Atoms in Everyday Life: Fulfill M Curie's Dream. 3 Credits.**

Introduction to applications of nuclear science and technology, utilizing web-based learning scenarios.

**NU\_ENG 4001. Topics in Nuclear Engineering. 2-5 Credit.**

Current and new developments in nuclear engineering. Prerequisite: instructor's consent. May be repeated for credit.

**NU\_ENG 4302. Safe Handling of Radioisotopes. 1 Credit.**

Introduction of methods and procedures for safe handling of radioisotopes in the research laboratory. Intensive lecture and laboratory training sessions designed for persons planning to use radioisotopes at the University. Prerequisite: instructor's consent.

**NU\_ENG 4303. Radiation Safety. 3 Credits.**

(Same as Radiologic Sciences [RA\_SCI] 4303) Types and origins of radiation; radiation detection and measurement; radiation interactions; shielding; dose calculations; federal, state and local regulations; and procedures for safe uses of radiation. Laboratory experiments in radiation measurements and protection. Prerequisite: college physics, calculus based.

**NU\_ENG 4305. Survey of Nuclear Engineering. 3 Credits.**

Introductory topics in nuclear engineering. Atomic and nuclear physics; nuclear reactor principles under steady-state and transient conditions; heat removal; shielding; instrumentation; power generation; fusion. Prerequisite: concurrent with Mathematics [MATH] 4100.

**NU\_ENG 4306. Advanced Engineering Math. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 4306). Applies ordinary and partial differential equations to engineering problems; Fourier's series; determinants and matrices; Laplace transforms; analog computer techniques. Prerequisite: Mathematics [MATH] 4100.

**NU\_ENG 4315. Energy Systems and Resources. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4020). Analysis of present energy usage in Missouri, USA and the world, evaluation of emerging energy technologies and trends for the future. Economics and environmental impact of the developed technologies. Prerequisite: Engineering [ENGINR] 2300 or equivalent.

**NU\_ENG 4319. Physics and Chemistry of Materials. 3 Credits.**

(same as Physics [PHYSICS] 4190 and Biological Engineering [BIOL\_EN] 4480 Chemistry [CHEM] 4490). Undergraduate/graduate level course offered every winter semester for students from Physics, Chemistry, Engineering and Medical Departments and consists of lectures, laboratory demonstrations, two mid term and one final exam. Graduate students will submit a term paper. Prerequisite: PHYSICS 2760 and Chemistry [CHEM] 1320 or equivalent and instructor's consent.

**NU\_ENG 4320. Natural Resources and Nuclear Energy. 3 Credits.**

Not for engineering students. Lecture, demonstration; describes physical environment, energy, power plants, nuclear reactors; radioactivity, its biological effects; health physics measures, rad-waste disposal; nuclear safeguards, nuclear explosives, societal implications. Prerequisite: high school algebra.

**NU\_ENG 4328. Introductory Radiation Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 4328, Radiology [RADIOL] 4328, Veterinary Medicine & Surgery [V\_M\_S] 7328). Concepts of ionizing radiations, their actions on matter through effects on simple chemical systems, biological molecules, cell, organisms, man. Prerequisite: junior standing, Sciences/Engineering; one course in Biological Sciences and Physics/Chemistry; or instructor's consent.

**NU\_ENG 4330. Science and Technology of Terrorism and Counter Terrorism. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4330). Terrorism has been a familiar tool of political conflict, and it has assumed greater importance during the past twenty years. This subject has been treated by political scientists in various forms, but the scientific and technological aspects of different forms of terrorism cannot be found in a single place. It is important for persons who propose counter measures to understand the basics of different types of terrorism such as for instance the nature of chemical agents, their properties such as toxicity, etc. in order to build better defense systems.

**NU\_ENG 4331. Nonproliferation Issues for Weapons of Mass Destruction. 3 Credits.**

Nonproliferation and impact on technology and world events. Prerequisites: junior/senior standing or instructor's consent. May be repeated for credit.

**NU\_ENG 4341. Nuclear Chemical Engineering. 3 Credits.**

Principles and processes of importance in the field of nuclear technology.

**NU\_ENG 4346. Introduction to Nuclear Reactor Engineering I. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4030). Engineering principles of nuclear power systems, primarily for the production of electrical energy. Prerequisites: Engineering [ENGINR] 1200, 2300 or equivalent.

**NU\_ENG 4349. Nuclear Engineering Materials. 3 Credits.**

Properties of materials for reactor components; radiation damage and corrosion; metallurgy of reactor materials. Prerequisites: upper division or graduate standing in Physical Sciences or Engineering, or instructor's consent.

**NU\_ENG 4350. Nuclear Forensic Analysis. 3 Credits.**

Principles/applications of nuclear techniques in solution of bioenvironmental problems. Uses of nuclear methods in studies of water/air pollution, biology, medicine, pesticides, geochemistry, ecological transport. Lectures, laboratory. Prerequisites: senior standing or instructor's consent.

**NU\_ENG 4353. Introduction to Fusion. 3 Credits.**

Basic plasma physics, principles of thermonuclear fusion, plasma confinement and heating, and devices. Prerequisites: senior standing in Engineering or Science or instructor's consent.

**NU\_ENG 4357. Nuclear Heat Transport. 2 Credits.**

Principles of heat transport in nuclear reactors. Brief review of the theory of flow coast down and convective heat transfer. Heat transfer loop experiments on flow coast down, steady state and transient forced convection heat transfer, boiling heat transfer. Prerequisites: Nuclear Engineering [NU\_ENG] 4305, 4346 or instructor's consent.

**NU\_ENG 4365. Nuclear Power Engineering. 3 Credits.**

Nuclear reactor heat generation and removal; nuclear reactor coolants; analysis of nuclear reactor power plants. Prerequisite: Engineering [ENGINR] 2300.

**NU\_ENG 4369. Principles of Direct Energy Conversion. 3 Credits.**

Principles and utilization of thermoelectric, thermionic, photovoltaic, magnetohydrodynamic generators and fuel cells. Prerequisites: Engineering [ENGINR] 2300, Mechanical and Aerospace Engineering [MAE] 3400, or equivalent.

**NU\_ENG 4375. Introduction to Plasmas. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4550). Equations of plasma physics, interaction of waves and plasmas; plasma sheaths and oscillations; measurements and applications. Prerequisites: ECE 4930 or instructor's consent.

**NU\_ENG 4379. Particulate Systems Engineering. 3 Credits.**

An introduction to natural and engineered particulate systems. Prerequisites: Chemical Engineering [CH\_ENG] 3234 or Mechanical and Aerospace Engineering [MAE] 4300 or equivalent.

**NU\_ENG 4382. Lasers and Their Applications. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 4570). Introduction to lasers, from both a conceptual viewpoint and from the application of Maxwell's equation, to develop the optical theory for lasers. Prerequisites: Physics [PHYSICS] 2760, and Mathematics [MATH] 4100.

**NU\_ENG 4391. Nuclear Radiation Detection. 3 Credits.**

(same as Chemistry [CHEM] 4600). Principles and application of radiation detectors and analyzers: ionization, Geiger-Muller, proportional, liquid and solid scintillation, semiconductor, pulse height analyzers, coincidence circuits, data reduction, tracer applications, activation analysis. Lectures, laboratory. Prerequisites: senior standing or instructor's consent.

**NU\_ENG 7001. Topics in Nuclear Science and Engineering. 2-5 Credit.**

Current and new developments in nuclear engineering. Prerequisite: instructor's consent.

**NU\_ENG 7080. Medical Ethics for Medical Physics. 1 Credit.**

This course will start with an introduction into medical ethics then transitions into research procedures with humans and animals. This course will cover research ethics, professional conduct, authorship, publishing, and plagiarism. Graduate Standing required.

**NU\_ENG 7085. Special Problems in Nuclear Science and Engineering. 1-5 Credit.**

Special Problems in Nuclear Science and Engineering.

**NU\_ENG 7087. Seminar in Nuclear Science and Engineering. 1 Credit.**

Reviews of investigations and projects of importance in nuclear engineering.

**NU\_ENG 7302. Safe Handling of Radioisotopes. 1 Credit.**

Introduction of methods and procedures for safe handling of radioisotopes in the research laboratory. Intensive lecture and laboratory training sessions designed for persons planning to use radioisotopes at the University. Prerequisite: graduate standing and instructor's consent.

**NU\_ENG 7303. Radiation Safety. 3 Credits.**

Types and origins of radiation; radiation detection and measurement; radiation interactions; shielding; dose calculations; federal, state and local regulations; and procedures for safe uses of radiation. Laboratory experiments in radiation measurements and protection. Prerequisite: graduate standing and college physics, calculus based.

**NU\_ENG 7305. Survey of Nuclear Engineering. 3 Credits.**

Introductory topics in nuclear engineering. Atomic and nuclear physics; nuclear reactor principles under steady-state and transient conditions; heat removal; shielding; instrumentation; power generation; fusion. Prerequisite: graduate standing and concurrent with Mathematics [MATH] 4100.

**NU\_ENG 7306. Advanced Engineering Math. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 4306). Applies ordinary and partial differential equations to engineering problems; Fourier's series; determinants and matrices; Laplace transforms; analog computer techniques. Prerequisite: graduate standing and Mathematics [MATH] 4100.

**NU\_ENG 7313. Nuclear Science for Engineering for Secondary Science Teachers. 3 Credits.**

This one-week course is for high school science and math teachers, and provides basic of nuclear scheme concepts and their applications, types of radiation (including radiation detection and protection), and industrial, medical and nuclear power generation application. Prerequisite: instructor's consent; actively engaged in STEM teaching at the secondary level.

**NU\_ENG 7315. Energy Systems & Resources. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7020). Analysis of present energy usage in Missouri, USA and the world, evaluation of emerging energy technologies and trends for the future. Economics and environmental impact of the developed technologies. Prerequisite: graduate standing and Engineering [ENGINR] 2300 or equivalent.

**NU\_ENG 7319. Physics and Chemistry of Materials. 3 Credits.**

(same as Physics [PHYSICS] 7190, Biological Engineering [BIOL\_EN] 4460 and Chemistry [CHEM] 7490). Undergraduate/graduate level course offered every winter semester for students from Physics, Chemistry, Engineering and Medical Departments and consists of lectures or laboratory demonstrations, two midterm and one final exam. Graduate students will submit a term paper. Prerequisite: graduate standing and Physics [PHYSICS] 2760 and Chemistry [CHEM] 1320 or equivalent and instructor's consent.

**NU\_ENG 7320. Natural Resources and Nuclear Energy. 3 Credits.**

Not for engineering students. Lecture, demonstration; describes physical environment, energy, power plants, nuclear reactors; radioactivity, its

biological effects; health physics measures, rad-waste disposal; nuclear safeguards, nuclear explosives, societal implications. Prerequisite: graduate standing and high school algebra.

**NU\_ENG 7328. Introductory Radiation Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC], Radiology [RADIOL], Veterinary Medicine & Surgery [V\_M\_S] 7328). Concepts of ionizing radiations, their actions on matter through effects on simple chemical systems, biological molecules, cell, organisms, man. Prerequisite: graduate standing, Sciences/Engineering; one course in Biological Sciences and Physics/Chemistry; or instructor's consent.

**NU\_ENG 7330. Science and Technology of Terrorism and Counter Terrorism. 3 Credits.**

Terrorism has been a familiar tool of political conflict, and it has assumed greater importance during the past twenty years. This subject has been treated by political scientists in various forms, but the scientific and technological aspects of different forms of terrorism cannot be found in a single place. It is important for persons who propose counter measures to understand the basics of different types of terrorism such as for instance the nature of chemical agents, their properties such as toxicity, etc. in order to build better defense systems. Prerequisite: graduate standing.

**NU\_ENG 7331. Nonproliferation Issues for Weapons of Mass Destruction. 3 Credits.**

Nonproliferation & impact on technology and world events. Prerequisite: junior or senior standing or instructor's consent.

**NU\_ENG 7335. Nuclear Safeguards Science and Technology. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7335). This course provides an overview of nuclear materials management and safeguards, including physical protection systems, material accounting and control, monitoring, and regulatory issues. Prerequisite: Nuclear Engineering [NU\_ENG] 4303/7303. Graduate Standing Required.

**NU\_ENG 7341. Nuclear Chemical Engineering. 3 Credits.**

Principles and processes of importance in the field of nuclear technology. Prerequisite: graduate standing.

**NU\_ENG 7346. Introduction to Nuclear Reactor Engineering I. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7030). Engineering principles of nuclear power systems, primarily for the production of electrical energy. Prerequisites: graduate standing and Engineering [ENGINR] 1200, 2300 or equivalent.

**NU\_ENG 7349. Nuclear Engineering Materials. 3 Credits.**

Properties of materials for reactor components; radiation damage and corrosion; metallurgy of reactor materials. Prerequisites: upper division or graduate standing in Physical Sciences or Engineering, or instructor's consent.

**NU\_ENG 7350. Nuclear Forensic Analysis. 3 Credits.**

Principles/applications of nuclear techniques in solution of bioenvironmental problems. Uses of nuclear methods in studies of water/air pollution, biology, medicine, pesticides, geochemistry, ecological transport. Lectures, laboratory. Prerequisites: Nuclear Engineering [NU\_ENG] 7303, instructor's consent.

**NU\_ENG 7353. Introduction to Fusion. 3 Credits.**

Basic plasma physics, principles of thermonuclear fusion, plasma confinement and heating, and devices. Prerequisites: graduate standing in Engineering or Science or instructor's consent.

**NU\_ENG 7357. Nuclear Heat Transport. 2 Credits.**

Principles of heat transport in nuclear reactors. Brief review of the theory of flow coast down and convective heat transfer. Heat transfer loop experiments on flow coast down, steady state and transient forced convection heat transfer, boiling heat transfer. Prerequisites: graduate standing and Nuclear Engineering [NU\_ENG] 4305, 4346 or instructor's consent.

**NU\_ENG 7365. Nuclear Power Engineering. 3 Credits.**

Nuclear reactor heat generation and removal; nuclear reactor coolants; analysis of nuclear reactor power plants. Prerequisite: graduate standing and Engineering [ENGINR] 2300.

**NU\_ENG 7369. Principles of Direct Energy Conversion. 3 Credits.**

Principles and utilization of thermoelectric, thermionic, photovoltaic, magnetohydrodynamic generators and fuel cells. Prerequisites: graduate standing and Engineering [ENGINR] 2300, Mechanical and Aerospace Engineering [MAE] 3400, or equivalent.

**NU\_ENG 7375. Introduction to Plasmas. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7550). Equations of plasma physics, interaction of waves and plasmas; plasma sheaths and oscillations; measurements and applications. Prerequisites: graduate standing and Electrical and Computer Engineering [ECE] 4930 or instructor's consent.

**NU\_ENG 7379. Particulate Systems Engineering. 3 Credits.**

An introduction to natural and engineered particulate systems. Prerequisites: graduate standing and Chemical Engineering [CH\_ENG] 3234 or Mechanical and Aerospace Engineering [MAE] 4300 or equivalent.

**NU\_ENG 7382. Lasers and Their Applications. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 7570). An introductory course in lasers. The course treats the subject from both a conceptual viewpoint and from the application of Maxwell's equations, to develop the optical theory for lasers. The course includes approximately 10 class-room hours of laboratory work with lasers. Prerequisites: graduate standing and Physics [PHYSICS] 2760 and Mathematics [MATH] 4100.

**NU\_ENG 7391. Nuclear Radiation Detection. 3 Credits.**

Principles and application of radiation detectors and analyzers: ionization, Geiger-Muller, proportional, liquid and solid scintillation, semiconductor, pulse height analyzers, coincidence circuits, data reduction, tracer applications, activation analysis. Lectures, laboratory. Prerequisites: graduate standing or instructor's consent.

**NU\_ENG 7422. Radiation Shielding. 3 Credits.**

Fundamentals of radiation interactions stressing neutron and gamma radiation transport; ray theory, removal theory, multi-group transport shield design principles. Prerequisites: Nuclear Engineering [NU\_ENG] 8409 or instructor's consent.

**NU\_ENG 7470. Fast Reactor Analysis. 3 Credits.**

Analytical methods for designing fast breeder reactor systems. Prerequisites: Nuclear Engineering [NU\_ENG] 8412, 8432, 8451 or instructor's consent. Graded on a S/U basis only.

**NU\_ENG 8001. Advanced Topics in Nuclear Science and Engineering. 3 Credits.**

Advanced developments in nuclear engineering. Prerequisite: instructor's consent.

**NU\_ENG 8085. Problems in Nuclear Science and Engineering. 1-6 Credit.**

Supervised investigation in nuclear engineering to be presented in the form of a report.

**NU\_ENG 8090. Research in Nuclear Science and Engineering. 1-99 Credit.**

Independent investigation in nuclear engineering to be presented as a thesis. Graded on an S/U basis only.

**NU\_ENG 8402. Nuclear Fuel Cycle. 3 Credits.**

Covers the nuclear fuel cycle from mine through enrichment, fuel element burn-up reactor physics, chemical reprocessing, waste disposal, with special emphasis on the newer proliferation-resistant fuel cycles.

Prerequisites: Nuclear Engineering [NU\_ENG] 4346 or 4305 and instructor's consent.

**NU\_ENG 8403. Applied Topics in Medical Physics & Health Physics. 1-6 Credit.**

Directed observations and experience in scientific aspects of daily operations in nuclear medicine, diagnostic radiology, radiotherapy and health physics. Prerequisite: departmental consent.

**NU\_ENG 8404. Nuclear Reactor Laboratory I. 3 Credits.**

Application of reactor physics principals to operation of and experiments with the University of Missouri Research Reactor. Neutron activation analysis, instrumentation, reactivity evaluation. Prerequisites: Nuclear Engineering [NU\_ENG] 4346 or 8411.

**NU\_ENG 8405. Nuclear Reactor Laboratory II. 3 Credits.**

Advanced experiments to measure diffusion length, Fermi age, material buckling, transfer function, neutron spectrum and other reactor characteristics. Reactor simulation with an analog computer. Prerequisite: Nuclear Engineering [NU\_ENG] 8411 or instructor's consent.

**NU\_ENG 8406. Clinical & Research Application in Medical and Health Physics. 1 Credit.**

To give students an understanding of the range of clinical practice and medical research involving the practice and nuclear physics/engineering. Prerequisites: Nuclear Engineering [NU\_ENG] 8409 and 4303, college calculus or equivalent and calculus based physics.

**NU\_ENG 8408. State Variable Methods in Automatic Control. 3 Credits.**

(same as Chemical Engineering [CH\_ENG] 8780, Electrical and Computer Engineering [ECE] 8780, Mechanical and Aerospace Engineering [MAE] 8780). State variables for continuous and discrete-time dynamic control systems; controllability and observability; optimal control of linear systems. Prerequisites: Chemical Engineering [CH\_ENG] 4370, Electrical Engineering [ECE] 4310, Mechanical and Aerospace Engineering [MAE] 4703 or instructor's consent.

**NU\_ENG 8409. Interaction of Radiation with Matter. 3 Credits.**

Theory/applications of radiation interaction processes. Reviews nuclear physics concepts; radioactive decay; sources/ spectra of ionizing radiation; collision mechanisms for charged particles, electromagnetic radiation, neutrons for interaction with matter. Prerequisite: Entrance requirements.

**NU\_ENG 8411. Nuclear Reactor Theory I. 3 Credits.**

Nuclear reactions; nuclear fission; introduces neutron transport; diffusion and slowing down of neutrons; steady-state homogeneous and heterogeneous reactor theory. Prerequisites: instructor's consent.

**NU\_ENG 8412. Nuclear Reactor Theory II. 3 Credits.**

Linear and non-linear reactor kinetics; perturbation theory; temperature and fission product effects; control rod theory; transport theory.

Prerequisites: Nuclear Engineering [NU\_ENG] 8411 or 4346.

**NU\_ENG 8421. Advanced Radiation Detection Electronics. 3 Credits.**

Principles of radiation pulse analysis with emphasis on applications.

Radiation detection devices; amplifying, shaping and discrimination circuits; nuclear pulse analysis; automated data analysis systems.

Lectures and lab. Prerequisites: Nuclear Engineering [NU\_ENG] 4346, 4391 or instructor's consent.

**NU\_ENG 8422. Radiation Shielding. 3 Credits.**

Fundamentals of radiation interactions stressing neutron and gamma radiation transport; ray theory, removal theory, multi-group transport shield design principles. Prerequisites: graduate standing and Nuclear Engineering [NU\_ENG] 8409 or instructor's consent.

**NU\_ENG 8429. Radiation Dosimetry. 3 Credits.**

Basis and applications of conventional and microscopic radiation dosimetry. Dose concepts and quantities; biological dose-response models; dose measurement principles; photon, charged particle, and neutron dosimetry. Prerequisite: Nuclear Engineering [NU\_ENG] 8409.

Recommended: Nuclear Engineering [NU\_ENG] 4328.

**NU\_ENG 8432. Nuclear Thermal Hydraulics and Safety. 3 Credits.**

Engineering topics from reactor heat transfer and thermal stresses, fuel cycle analysis, power plant thermodynamics, shielding, and reactor safety analysis. Prerequisites: Nuclear Engineering [NU\_ENG] 8411 or 4346, or instructor's consent.

**NU\_ENG 8434. Fracture Mechanics I. 3 Credits.**

(same as Mechanical & Aerospace Engineering [MAE] 8211). Mechanics of flawed structure. Concepts include Griffith theory, Barenblatt's theory, Irwin analysis, energy analysis of cracked bodies, fracture toughness testing, plane strain, plane stress, transition temperature concepts, subcritical flaw growth. Prerequisites: Mechanical & Aerospace Engineering [MAE] 3200 or instructor's consent.

**NU\_ENG 8435. Physics of Diagnostic Radiology. 3 Credits.**

Principles and applications of X-ray production and interactions. Images production concepts including X-ray film, intensifying screens, grids, fluoroscopy, image intensification and television monitors. Image quality analysis and assessment. Prerequisites: Nuclear Engineering [NU\_ENG] 8409 or equivalent or instructor's consent.

**NU\_ENG 8439. Clinical Physics in Radiotherapy. 3 Credits.**

Principles and applications of radiation producing units, exposure and dose measurements, and calibration. External beam physics parameters and application to fixed field and rotational field treatment planning.

Prerequisite: Nuclear Engineering [NU\_ENG] 8409 or equivalent or instructor's consent.

**NU\_ENG 8444. Fracture and Fatigue Prevention in Engineering Practice. 3 Credits.**

(same as Mechanical & Aerospace Engineering [MAE] 8290). Practical design problems. Introduction to retrofit design, maintenance, product improvement and new design from a fatigue and fracture prevention philosophy. Fail safe and safe life designs are presented. Prerequisite: Nuclear Engineering [NU\_ENG] 8434.

**NU\_ENG 8450. Superconductivity and Its Applications. 3 Credits.**

(same as Electrical and Computer Engineering [ECE] 8020).

Phenomenology and theory of superconductivity; cryogenic practice;

metallurgy of superconducting elements, alloys and compounds. Applications, present and prospective. Graded on an S/U basis only.

**NU\_ENG 8451. Computational Methods of Reactor Analysis. 3 Credits.**

Applies numerical analysis and digital computation to topics from multi-group diffusion theory, transport theory, reactor kinetics, reactor thermal hydraulics, radiation shielding, reactor safety. Prerequisites: Nuclear Engineering [NU\_ENG] 8411 and Mathematics [MATH] 4300.

**NU\_ENG 8452. Ultrasound and Magnetic Resonance Imaging. 3 Credits.**

The physical principles of MRI and ultrasound including clinical instrumentation, artifacts in images, biological effects and quality control. Images obtained with both techniques will be presented. Prerequisite: Nuclear Engineering [NU\_ENG] 4391, 8409, 4306 or equivalent.

**NU\_ENG 8453. Advanced Fusion Theory. 3 Credits.**

Plasma stability theory, charged particle diffusion, slowing down of charged particles, interaction of radiation with matter, direct energy conversion using charged particles, and engineering considerations. Prerequisites: Nuclear Engineering [NU\_ENG] 4353 and 4375 or Physics [PHYSICS] 8450 or instructor's consent.

**NU\_ENG 8454. Clinical Physics of Nuclear Medicine. 3 Credits.**

Physical principles, statistics of radionuclide decay and highlights into the most current instrumentation to utilize in vivo radionuclides for both diagnostic imaging and therapy. Also includes brachy therapy. Prerequisite: Nuclear Engineering [NU\_ENG] 4306, 8409 or equivalent.

**NU\_ENG 8455. Growth, Characterization & Appl. of Diamond & Related Materials. 3 Credits.**

This course explores the development of diamond films. Discussion of other wide band-gap materials are covered. Topics include Chemistry of Diamond Growth, Thermodynamics, Nucleation, Methods of Growth, Methods of Impurity Control, Characterization and Modification, Doping, and Applications.

**NU\_ENG 8461. Neutron Transport Theory. 3 Credits.**

The Boltzmann equation; general properties and solution; numerical methods of solving the transport equation; neutron thermalization and neutron spectra. Prerequisites: Nuclear Engineering [NU\_ENG] 8412; Mathematics [MATH] 4940, 4300, or instructor's consent.

**NU\_ENG 8470. Fast Reactor Analysis. 3 Credits.**

Analytical methods for designing fast breeder reactor systems. Prerequisites: Nuclear Engineering [NU\_ENG] 8412, 8432, 8451 or instructor's consent. Graded on a S/U basis only.

**NU\_ENG 8471. Radiation Protection. 3 Credits.**

Theory and applications of radiation protection and health physics. Radiation dosimetry methods and calculations, shielding evaluations, equipment surveys and inspection, environmental monitoring, radiation standards and regulations and administration presented. Prerequisites: Nuclear Engineering [NU\_ENG] 4303 and 4328.

**NU\_ENG 9090. Research in Nuclear Science and Engineering. 1-99 Credit.**

Independent investigation in nuclear engineering to be presented as a thesis. Graded on an S/U basis only.

## **Nuclear Medicine (NUCMED)**

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**NUCMED 1000. Orientation to Nuclear Medicine. 1 Credit.**

An overview using a series of short rotations through local nuclear medicine departments and a self-directed review of a current text. Clinical rotations for this course are arranged on an individual basis. Graded on S/U basis only.

**NUCMED 3255. Orientation to Clinical Practice. 2 Credits.**

This course provides an introductory experience to clinical practice. Prerequisite: Must be accepted into Nuclear Medicine Program, restricted to Radiologic Sciences students, junior standing required. Graded on A/F basis only.

**NUCMED 3256. Clinical Nuclear Medicine I. 2 Credits.**

Introductory clinical course for senior level students. Introduces instrumentation, administration, procedures, and laboratory techniques. Includes supervised clinical participation. Prerequisite: Nuclear Medicine [NUCMED] 3263 and restricted to Radiologic Sciences students only.

**NUCMED 3263. Morphological Correlations in Nuclear Medicine I. 3 Credits.**

Anatomy, physiology, and pathology of the human body as assessed using medicine techniques. The first of two courses that address current clinical applications of nuclear medicine. Prerequisite: Nuclear Engineering [NU\_ENG] 4303, restricted to Radiologic Sciences students only.

**NUCMED 3328. Introductory Radiation Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 4328, Nuclear Engineering [NU\_ENG] 4328, Veterinary Medicine & Surgery [V\_\_S] 7328). Concepts of ionizing radiations, their actions on matter through effects on simple chemical systems, biological molecules, cell, organisms, man. Prerequisite: junior standing Sciences/Engineering; one course in Biological Sciences & Physics/Chemistry; or instructor's consent.

**NUCMED 4085. Problems in Nuclear Medicine. 1-3 Credit.**

Supervised investigation in an aspect of nuclear medicine technology, usually culminating in a written report.

**NUCMED 4232. Clinical In Vitro. 3 Credits.**

Detailed review of current regulations and procedures governing the use of open sources of radioactivity in a nuclear medicine setting. Restricted to Radiologic Sciences students.

**NUCMED 4268. Clinical Nuclear Medicine II. 3 Credits.**

Continuation of clinical series taught in conjunction with Nuclear Medicine [NUCMED] 3256 and 4232. Addresses advanced therapeutic and diagnostic procedures, computer applications, and quality assurance procedures. Prerequisite: NUCMED 3256. Restricted to Radiologic Science students only.

**NUCMED 4269. Clinical Nuclear Medicine III. 1 Credit.**

Final course in clinical series. Seminar discussion of the areas of professional ethics, current medical-legal considerations, and future nuclear medicine applications. Prerequisite: Nuclear Medicine [NUCMED] 3256. Restricted to Radiologic Science students only.

**NUCMED 4299. Morphological Correlations in Nuclear Medicine II. 3 Credits.**

Anatomy, physiology, and pathology of the human body as assessed using nuclear medicine techniques. The second of two courses that address current clinical applications of nuclear medicine. Prerequisite: Nuclear Medicine [NUCMED] 3263, restricted to Radiologic Sciences students.

**NUCMED 4327. Nuclear Medicine Instrumentation. 3 Credits.**

Radionuclide imaging systems and the use of computers. Topics include Anger camera systems, emission tomography, ultrasound, nuclear magnetic resonance, and bone absorptionmetry. Prerequisites: Physics [PHYSICS] 1220 and Mathematics [MATH] 1400, restricted to Radiologic Sciences students.

**NUCMED 4329. Radiopharmaceuticals in Nuclear Medicine. 3 Credits.**

Introduces concepts of radiopharmacy, generator systems, labeling of materials, quality control procedures and FDA regulations concerning radiopharmaceuticals. Prerequisites: Chemistry [CHEM] 1320 and instructor's consent.

**NUCMED 4330. PET in Nuclear Medicine. 3 Credits.**

Overview of special isotope production techniques for positron emitting agents; instrumentation concerns beyond standard Anger imaging; and image critique and analysis with morphologic correlation. Graded on A/F basis only. Prerequisite: Physics [PHYSICS] 1210 and Nuclear Medicine [NUCMED] 4327 or instructor's consent. May be repeated for credit. Restricted to Radiologic Sciences students only.

**NUCMED 4940. Clinical In Vivo I. 6 Credits.**

Practical experience in the clinical setting with imaging procedures performed in nuclear medicine. Restricted to Radiologic Sciences students.

**NUCMED 4941. Clinical In Vivo II. 7 Credits.**

Practical experience in clinical setting with advanced imaging techniques and instrument quality control. Prerequisite: Nuclear Medicine [NUCMED] 4940. Restricted to undergraduate Radiologic Sciences students.

**NUCMED 7085. Problems in Nuclear Medicine. 3 Credits.**

Supervised investigation in an aspect of nuclear medicine technology, usually culminating in a written report.

**NUCMED 7329. Radiopharmaceuticals in Nuclear Medicine. 3 Credits.**

Introduces concepts of radiopharmacy, generator systems, labeling of materials, quality control procedures and FDA regulations concerning radiopharmaceuticals. Prerequisites: Chemistry [CHEM] 1320 and instructor's consent.

**NUCMED 7330. PET in Nuclear Medicine. 3 Credits.**

Overview of special isotope production in techniques for positron emitting agents; instrumentation concerns beyond standard Anger imaging; and image critique and analysis with morphologic correlation. Prerequisites: Physics [PHYSICS] 1210 and Nuclear Medicine [NUCMED] 4327 or instructor's consent. May be repeated for credit. Graded on A/F basis only.

## Nursing (NURSE)

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**NURSE 1000. Advisory Seminar for Nursing. 1 Credit.**

Orientation to the undergraduate nursing program, professional role development, and introduction to the professional milieu. Graded on an S/U basis only.

**NURSE 2000. Nursing as a Profession. 3 Credits.**

Introduces the structure of nursing knowledge and explores professional nursing role characteristics from historical, ethical, legal, economic, professional, occupational and social perspectives. Examines nursing as

subsystem of the health care system. Prerequisite: sophomore standing. Restricted to pre-nursing and clinical nursing majors.

**NURSE 2100. Psychosocial and Communication Issues in Nursing. 2-3 Credit.**

Reviews psychosocial and communication issues. Focuses on improving interpersonal communication skills and learning how to provide therapeutic interventions to people with selected mental health issues. An experiential model emphasizes personal skill development strategies. Prerequisites: Sophomore Standing. Restricted to pre-nursing majors only.

**NURSE 2100H. Psychosocial and Communication Issues in Nursing - Honors. 2 Credits.**

Reviews psychosocial and communication issues. Focuses on improving interpersonal communication skills and learning how to provide therapeutic interventions to people with selected mental health issues. An experiential model emphasizes personal skill development strategies. Prerequisites: Sophomore Standing. Restricted to pre-nursing majors only. Honors eligibility required.

**NURSE 3002. Topics in Nursing - Biological, Physical, Mathematical. 1-4 Credit.**

Specialized topics in nursing not available through regularly offered courses. Any semesters, no prerequisites. Sections may be offered either on S/U or A/F basis.

**NURSE 3006. Cultural Expeditions in Nursing. 3 Credits.**

Directed field experiences in varied settings exploring local customs and cultural/ethnic diversities influencing health care delivery. Prerequisite: Nursing [NURSE] 3670 and instructor's consent. Graded on S/U basis only.

**NURSE 3080. Communication and Computer Skills. 2 Credits.**

Introduces RN students to MU and MU Sinclair School of Nursing. Provides education in essential competencies needed for success in the RN-BSN Option including writing skills, computer literacy, library and Internet research. Prerequisite: clinical major.

**NURSE 3100. Pharmacology for Nursing. 3 Credits.**

This course will focus on pharmacological classification and the nurse's role in medication administration and patient education. Medication issues with special populations will be addressed. Prerequisites: Anatomy and Physiology or instructor's consent. May be repeated for credit. Graded on A/F basis only.

**NURSE 3170. Nursing Skills, Technologies, and Simulation. 4 Credits.**

Provides laboratory experiences for fundamental to complex nursing skills and procedures. Focuses on application of therapeutic interventions and procedure to provide safe, patient-centered care. Co-requisite: Nursing [NURSE] 3270.

**NURSE 3180. Role Transitions. 3 Credits.**

Explores returning-to-school issues important to adult learners. Links previous basic nursing courses with baccalaureate courses and begins building new knowledge on prior nursing education. Pre/Co-requisite: Nursing [NURSE] 3080.

**NURSE 3200. Pathophysiology and Therapeutics. 4 Credits.**

Focuses on commonly occurring alterations in health as a result of pathophysiological deviations. Developmental concepts, diagnostics, and treatment modalities are integrated throughout course content. Prerequisite: Anatomy and Physiology.



**NURSE 3260. Pathophysiology. 3 Credits.**

Focus is on commonly occurring alterations in health across the life-span. Development concepts, diagnostics, and treatment modalities are integrated throughout course content. Enrollment requires admission to the accelerated BSN option. May be repeated for credit. Graded on A/F basis only.

**NURSE 3270. Foundations of Nursing: Physical Assessment and the Nursing Process. 6 Credits.**

Provides knowledge and skills in physical assessment and applications of nursing process. Foundational knowledge is applied to individual patients in clinical settings. Pre/co-requisite: Nursing [NURSE] 2000, 2900, 3170, 3200, pharmacology.

**NURSE 3300. Pharmacology and Nursing Implications. 4 Credits.**

This course will focus on pharmacological classifications and the nurse's role in medication administration and patient education. Medication issues with special populations will be addressed. Prerequisite courses: Anatomy & Physiology or consent of instructor. Graded A-F only.

**NURSE 3350. Individual Study. 0-6 Credit.**

Independent study for qualified students in specific areas of interest in nursing under faculty guidance. Prerequisite: instructor's consent. Some sections may be graded A/F only or S/U only.

**NURSE 3470. Mental Health Nursing. 4 Credits.**

This course teaches behavioral, social, interpersonal, and systems dimensions of mental health nursing. Emphasis is on therapeutic use of self in assisting clients throughout the life cycle with mental health deviations. Prerequisite: Nursing [NURSE] 3270.

**NURSE 3570. Methods of Assisting II. 2 Credits.**

Expands on Methods of Assisting I. Focuses on application of selected complex nursing interventions to provide direct care in selected nursing situations. Prerequisite: Nursing [NURSE] 3170, corequisite: clinical course.

**NURSE 3670. Nursing of Adults I. 6 Credits.**

Application of nursing process to deliver care for hospitalized adults with health deviations. Evidence, technologies, professional standards and collaboration are used to enhance patient-centered, safe and effective care. Prerequisites: Nursing [NURSE] 3170 and 3270.

**NURSE 3750. Nursing of the Childbearing Family. 3 Credits.**

Provides learning experience with childbearing family. Applies nursing process to promote health and well-being for the childbearing family. Prerequisites: Nursing [NURSE] 3260, 3270, and admission to accelerated BSN option. Graded on A/F basis only. May be repeated for credit.

**NURSE 3760. Pediatric Nursing. 3 Credits.**

Provides learning experiences with children and their families from newborn to adolescents. Examines health alterations that interfere with self-care in and for children. Prerequisites: Nursing [NURSE] 3260, 3270, admission to accelerated BSN option.

**NURSE 3870. Gerontological Nursing Care. 3 Credits.**

Emphasis on normal aging processes, health promotion, disease prevention, and management of acute and chronic health problems in the older adult. Prerequisite: Nursing [NURSE] 3270.

**NURSE 3900. Introduction to Nursing Science. 3 Credits.**

Introduces nursing as a science from the perspective of knowledge development. Structures nursing knowledge from a selfcare deficit nursing theory perspective. Presents nursing research as a method

of knowledge development and validation. Prerequisite or concurrent: Statistics. Must be a clinical nursing major.

**NURSE 4200. Nursing Ethics and Law. 3-4 Credit.**

Analyzes clinical nursing situations using ethical principles and decision-making models. Examines the basic doctrines and principles foundational for providing legally sound nursing practice. Pre/Corequisite: Senior Clinical Major or Nursing [NURSE] 3080.

**NURSE 4270. Nursing of Children. 5 Credits.**

Nursing of children with acute and chronic health and developmental deviations. Self-care and dependent care abilities are emphasized. Content includes health promotion for infants and children. Prerequisites: Nursing [NURSE] 3670 and 3770.

**NURSE 4300. Nursing Issues/Leadership and Management. 2 Credits.**

Examines leadership and organizational theories in relation to resource management and effective delivery of nursing to sets of clients. Analyzes societal/political issues and trends related to nursing and contemporary health care. Pre/Corequisite: Nursing [NURSE] 3670 or 3180 or instructor's consent.

**NURSE 4380. Health Assessment and Pathophysiology. 4 Credits.**

Examines biologic basis for selected commonly occurring diseases throughout the life-span. Study and performance of health assessments with application of findings to adults and children.

**NURSE 4400. Nursing Leadership and Management. 2 Credits.**

Examines leadership, management, and organizational theories in relation to resource management and effective delivery of nursing to sets of clients. Analyzes societal and political issues and trends related to nursing and contemporary health care. Prerequisite: Nursing [NURSE] 3080; Pre/Co-requisite: NURSE 3180. Graded on A-F basis only.

**NURSE 4470. Nursing of Women and Newborns. 5 Credits.**

Focuses on newborn care, women's reproductive and postreproductive health, and health deviation concerns of women and newborns. Emphasizes development, implementation, and evaluation of nursing systems for families and their members. Prerequisite: Nursing [NURSE] 3270.

**NURSE 4600. Women's Health. 3 Credits.**

A survey of international and domestic women's health issues; considers historical antecedents and specific effects of socio-cultural variables and economic development on women's health in developing and developed nations.

**NURSE 4870. Nursing of Adults II. 7 Credits.**

Application of nursing process to care for adults with acute physiological health deviations. Leadership and management principles are integrated in delivering care for sets of clients. Prerequisites: Nursing [NURSE] 4270, 4370; or pre/corequisite: 4300.

**NURSE 4875. Principles of Public Health Nursing: Population-Based Practice. 4 Credits.**

Focuses on population-based concepts of public health nursing and application to practice through completion of a major project. Designed for practicing public health nurses employed in local public health agencies in Missouri. Prerequisites: RN license and employed in Public Health in Missouri. Course may be repeated for credit. Graded on A/F basis only.

**NURSE 4930. Evidence-Based Nursing Practice. 5 Credits.**

Concepts of evidence-based nursing practice are applied to clinical nursing questions, emphasizing use of research findings in practice

settings to generate best nursing practices and optimal patient care outcomes. Prerequisite: Nursing [NURSE] 4950.

**NURSE 4950. Nursing Theory and Research. 3 Credits.**

Addresses nursing research as means of acquiring and refining knowledge. Research utilization to impact nursing addressed. Examines development and utilization of nursing theory, primarily Self-Care Deficit Nursing Theory. Pre/corequisite: Nursing [NURSE] 3080.

**NURSE 4970. Nursing in Communities. 4-5 Credit.**

Examines roles and functions of nurses within community with emphasis on application of community/public health concepts and design and implementation of nursing systems of care for individuals, families, and populations. Prerequisite: Nursing [NURSE] 4270 and 4370; or 3760 or 4580.

**NURSE 4975. The Capstone Experience. 1 Credit.**

Community project-based course that integrates and applies principles previously learned in the RN-BSN curriculum. Open to students who have previously completed Nursing 4875. Prerequisites: Nursing [NURSE] 4875; RN license and employed in Public Health in Missouri. Course may be repeated for credit. Graded on A/F basis only.

**NURSE 7001. Special Topics in Nursing. 1-3 Credit.**

Specialized topics in advanced nursing not available through regularly offered courses.

**NURSE 7085. Problems in Nursing. 1-3 Credit.**

Guided readings, special study, and/or a practicum in an area of the student's interest or an area which the student needs to strengthen. Prerequisite: instructor's consent.

**NURSE 7087. Leadership and Technology Institute. 1 Credit.**

Introduction to knowledge and skills essential to support research and practice doctorates. Prerequisite: Admission to DNP or PhD program. May be repeated for credit.

**NURSE 7100. Theoretical Basis for Advanced Nursing. 3 Credits.**

Analysis, application and evaluation of a variety of nursing and non nursing theories used in advanced nursing practice and research.

**NURSE 7110. Advanced Nursing Role Acquisition. 3 Credits.**

An overview of the advanced nursing practice role and professional issues. Provides foundational knowledge on which other advanced nursing courses will build. Prerequisite: Admission to the graduate program or faculty consent.

**NURSE 7111. Trends and Issues in Nursing. 3 Credits.**

Issues and trends involving professional nursing practice are examined from socioeconomic, organizational, legal and ethical perspectives. Past, present and future roles and practice of nurses are examined.

**NURSE 7120. Advanced Physiology and Pathophysiology. 3 Credits.**

Focus on the normal and altered physiological functioning of body systems. Provides essential knowledge of human health and disease across the lifespan necessary for advanced nursing practice.

**NURSE 7130. Advanced Pharmacology and Pharmacotherapeutics. 3 Credits.**

Advanced practice nurse drug therapy management for health maintenance and treatment of acute episodic and chronic health problems in various populations over the life span. Prerequisite: BSN or instructor's consent.

**NURSE 7140. Advanced Health Assessment and Promotion. 3.5 Credits.**

Expands history and physical assessment techniques across lifespan. Addresses diagnostic reasoning, differential diagnosis, selection of common diagnostic test, disease risk factors, and health promotion strategies. Prerequisite: BSN or instructor's consent.

**NURSE 7150. Research Basis for Advanced Nursing. 3 Credits.**

Examines fundamentals of scientific inquiry. Addresses research design issues. Focuses on interpreting, critiquing, and synthesizing research findings. Prerequisites: Nursing [NURSE] 7100.

**NURSE 7211. Stress Management. 3 Credits.**

Review of contemporary research on the causes, prevention, and treatment of stress. Examination of utility and validity of a variety of stress reduction methods. Development of selected self-management skills.

**NURSE 7212. Legal Parameters of Nursing. 3 Credits.**

This course provides the basic doctrines and principles of the law foundational to legally sound nursing practice. Included among significant topics are tort law, nurse practice act, licensure, effect of contract law.

**NURSE 7310. Advanced Health Assessment for Pediatric Nursing Practice. 3.5 Credits.**

Comprehensive assessment of children through adolescence including those with significant health and/or developmental deviations using advanced diagnostic reasoning process. Emphasis on health history, cultural diversity, differentiation, interpretation and documentation of findings.

**NURSE 7320. Advanced Pediatric Pathophysiology. 3 Credits.**

Embryology of major organ systems and specific physiologic and pathophysiologic in children from birth through age 18 will be studied. Emphasis is on the relationship between altered physiologic functioning, decision making and standards of advanced nursing.

**NURSE 7330. Pediatric Pharmacology for Advanced Nursing Practice. 3 Credits.**

Clinical pharmacotherapeutics course that builds on prior pharmacology knowledge. Major focus is pharmacotherapeutics for primary care management of children to age eighteen. Emphasis on clinical critical thinking used to prescribe drugs.

**NURSE 7600. Women's Health. 3 Credits.**

A survey of international and domestic women's health issues; considers historical antecedents and specific effects of socio-cultural variables and economic development on women's health in developing and developed nations.

**NURSE 7750. Physical Function and Older Adults. 3 Credits.**

(Same as Family and Community Medicine [F\_C\_MD] 7750, Architectural Studies [ARCHST] 7640, Health Management and Informatics [HMI] 7750, Human Development and Family Studies [H\_D\_FS] 7750, Public Health [P\_HLTH] 7750, and Social Work [SOC\_WK] 7752). This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graded A-F only. Graduate Standing Required.

**NURSE 7751. Psychosocial Function and Older Adults. 3 Credits.**

(same as Architectural Studies [ARCHST] 7650, Family Community Medicine [F\_C\_MD] 7751, Health Management and Informatics [HMI] 7751, Human Development and Family Studies [H\_D\_FS] 7751, Public Health [P\_HLTH], 7751 and Social Work [SOC\_WK] 7751). This course

takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**NURSE 7854. Preparing Nurse Educators. 3 Credits.**

Explores the role of the nurse educator. Emphasis will be on the development, evaluation, differences and implementation of the nurse educator in the functional roles. Prerequisites: Admission to the Master Science in Nursing Program or instructor's consent.

**NURSE 8001. Topics in Advanced Clinical Nursing. 3 Credits.**

Specialized topics in advanced clinical nursing not available through regularly offered courses.

**NURSE 8010. Family Dynamics and Intervention. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 8012). Theories of family function and dysfunction; techniques of assessment; models of family intervention. Practicum with selected families. Prerequisite: Nursing [NURSE] 7100 (Nursing students).

**NURSE 8020. Advanced Statistical Methods in the Health Sciences. 3 Credits.**

Primary topics include a review of hypothesis testing, estimation and confidence intervals, general linear models, multiple logistic regression, and multilevel modeling. There will be an emphasis on application to the health sciences. Prerequisite: Statistics [STAT] 7020 or equivalent. Graduate Standing Required.

**NURSE 8030. Interpreting Statistical Evidence in the Health Sciences. 3 Credits.**

Students learn to critically evaluate statistical designs and data analysis methods used in health sciences research and scientific evidence for health care decision making. May be repeated for credit. Prerequisite: Graduate level statistics course.

**NURSE 8085. Problems in Nursing. 1-4 Credit.**

Guided readings, special study and/or a practicum in an area of the student's interest or in an area which the student needs to strengthen. Prerequisites: instructor's consent. Selected sections of the course may be offered on A/F or S/U basis only.

**NURSE 8090. Research in Nursing. 1-99 Credit.**

Original investigation for presentation as thesis or dissertation. Prerequisites: graduate statistics, instructor's consent. Graded on S/U basis only.

**NURSE 8100. Principles of Epidemiology. 3 Credits.**

Explores key concepts of epidemiology and epidemiologic methods for studying the distribution and determinants of health and disease in populations. Application to public health and population-based practice addressed. Prerequisite: Nursing [NURSE] 7150 or faculty consent.

**NURSE 8110. Concepts for Specialization in Public Health Nursing. 3 Credits.**

Key concepts fundamental to specialization in public health nursing, including core public health functions. Emphasis upon integrating public health science, nursing theory, and methodological/leadership skills. Pre- or corequisite: Nursing [NURSE] 7100.

**NURSE 8120. Community-Based Public Health Interventions. 3-4.5 Credit.**

Assessing and Diagnosing health-related needs of at-risk and vulnerable populations. Evaluating outcome-based research. Clinical practice implementing a public health intervention. Prerequisite: Nursing [NURSE]

8100, 8110, graduate level Statistics [STAT] course; Pre/Co-requisite: Nursing [NURSE] 7150.

**NURSE 8210. Special Health Care Needs of Children in the School Setting. 3.5-4 Credit.**

Perform developmental, neuro developmental, and psychosocial assessments of chronically ill children. Collaborate with families, schools; health care, community, family services to meet child's needs. Prerequisite: Nursing [NURSE] 7100 or instructor's consent.

**NURSE 8300. Public Health and Sociocultural Issues. 3 Credits.**

Explores concepts of public health with a focus on the advanced practice nurse in population-based/primary care practice; core public health functions will be addressed at three service levels--the aggregate, the family, and the individual. Prerequisite: Nursing [NURSE] 7100.

**NURSE 8310. Health Disparities of Rural and Other Underserved Populations. 3 Credits.**

In-depth examination of rural and other vulnerable populations and their interactions with the health care system including access, utilization, and outcomes. Prerequisites: Nursing [NURSE] 7087, 8300 or faculty consent. May be repeated for credit.

**NURSE 8400. Adult and Geriatric Primary Care I. 3.5-5 Credit.**

Advanced practice nursing clinical diagnosis and management of acute and chronic cardiovascular, respiratory, HEENT, renal, metabolic and musculoskeletal problems in adults, older adults and their families. Prerequisite: Nursing [NURSE] 7120, 7130, 7140.

**NURSE 8410. Adult and Geriatric Primary Care II. 3.5-5 Credit.**

Advanced practice nursing clinical diagnosis and management of acute and chronic gastrointestinal, endocrine, hematological, neuropsychological problems and bioterrorism and CAM issues in adults, older adults and their families. Prerequisite: Nursing [NURSE] 8400.

**NURSE 8420. Newborn Through Adolescence Primary Care. 3.5-5 Credit.**

Advanced nursing practice of newborn through adolescence of health maintenance/promotion, clinical diagnosis and management of common childhood illness, behavioral, developmental problems. Advanced knowledge of human growth, development, family dynamics, community resources, collaborative relationships. Integrated clinical practicum. Prerequisites: Nursing [NURSE] 7140 or 7310.

**NURSE 8430. Reproductive and Sexual Health Primary Care. 3.5-5 Credit.**

Reproductive, sexual issues, adolescence through aging. Design, delivery, evaluation of nursing management of women, reproductive health care of men. Stresses personal health promotion. Prerequisite: Nursing [NURSE] 7140, 8410 or instructor's consent.

**NURSE 8500. Primary Health Care Management of Aging I. 3 Credits.**

Health promotion, wellness, concepts of normal aging. Design, delivery, evaluation of primary health care management of aging adults from an advanced practice nursing perspective. Prerequisites: Nursing [NURSE] 7130, 7140, 8400 or instructor's consent.

**NURSE 8510. Primary Health Care Management of Aging II. 3 Credits.**

Continuing emphasis on health promotion, wellness, concepts of aging. Primary health care management of complex health care problems in aging adults from advanced practice nursing perspective. Prerequisite: Nursing [NURSE] 8410, 8500, instructor's consent.

**NURSE 8540. Advanced Diagnostics and Procedures. 3.5 Credits.**

Expands upon knowledge of advanced assessment, diagnostic, and procedural skills; Utilizes current technology in a cost-effective and patient-centered manner. Clinical component allows for increasing specialty-specific knowledge. Prerequisites: Nursing [NURSE] 7140, 7310, or equivalent. May be repeated for credit.

**NURSE 8610. Diagnostics and Psychopharmacology for Mental Health Nurses. 3.5-4 Credit.**

Emphasis is on the neurobiologic basis and diagnosis of mental health problems and advanced nursing management of psychiatric conditions using pharmaceutical agents. Prerequisites: Nursing [NURSE] 7120, 7130 and 7140.

**NURSE 8620. Brief Individual Psychotherapy for Mental Health Nurses. 3.5-4 Credit.**

Develops advanced skills in assessment, treatment, and follow-up evaluation of individuals experiencing acute mental health problems. Emphasizes brief psychotherapy based on frameworks from nursing and other disciplines. Prerequisites: Nursing [NURSE] 8610.

**NURSE 8640. Group Therapy and Social Skills Training. 3.5-4 Credit.**

Application of group and behavioral methods in mental health prevention, promotion, maintenance, and restoration. Designing, implementing, and evaluating mental health promotion groups and social skills training programs. Prerequisite: Nursing [NURSE] 7100 or concurrent.

**NURSE 8660. Mental Health Nursing Interventions for Families. 3.5-4 Credit.**

Application of nursing and family theories in advanced nursing management of families experiencing a variety of problems. Emphasis on designing, implementing, and evaluating advanced nursing interventions for families. Prerequisites: Nursing [NURSE] 8620 or consent of instructor.

**NURSE 8680. Pediatric Mental Health Assessment and Treatment. 3.5-4 Credit.**

Develops advanced skills in psychiatric assessment and follow-up evaluation of children and adolescents experiencing mental health problems. Explores diagnosis, treatment, and management of child and adolescent mental health disorders. Prerequisites: Nursing [NURSE] 8610 or faculty consent. Graded on A/F basis only.

**NURSE 8710. Clinical Management of Acute and Critical Care Problems. 3.5-5 Credit.**

Advanced practice nurse management of selected clinical problems across the lifespan commonly encountered in the acute and/or critical care settings. Patient safety, technology, and product selection addressed. Integrated clinical practicum with selected population and setting. Prerequisite: Nursing [NURSE] 7140. May be repeated for credit.

**NURSE 8720. Symptom Management in Acute and Chronic Illness. 3-4 Credit.**

Clinical management of symptoms of acute and chronic illness across the lifespan. Preparation for teaching patient self-management strategies. Integrated clinical practicum with selected population and setting. Prerequisite: Nursing [NURSE] 7140 or faculty consent.

**NURSE 8800. Leadership and Management in Healthcare Systems. 4 Credits.**

Prepares nurse leaders who facilitate and integrate complex structures and processes in health care systems. Understanding of partnerships, accountability, continuum-defined health care systems, self-managed

teams, and value-based organizations. Prerequisite: Nursing [NURSE] 7100.

**NURSE 8810. Management of Patient Care Services. 4 Credits.**

Management of Patient Care Services (4.0). Prepares nurses to effectively manage personnel, clinical operations, and quality improvement initiatives. Emphasizes techniques that facilitate sound nursing management across the care continuum. Multiple dimensions of managing patient care operations are considered. Prerequisite: Nursing [NURSE] 7100.

**NURSE 8820. Health Care Financial Management. 4 Credits.**

Prepares nurses to use the techniques that facilitate financial analysis and decision-making for patient care programs across the healthcare continuum. Focuses on efficient, effective management of resources for delivery of quality healthcare services. Prerequisite: Nursing [NURSE] 7100.

**NURSE 8850. Teaching Nursing. 3 Credits.**

Principles and methods of teaching, evaluation, and curriculum construction in undergraduate nursing education. Prerequisite: Educational School and Counseling Psychology [ESC\_PS] 4100 or equivalent.

**NURSE 8854. Teaching Strategies in Nursing. 3 Credits.**

Examines principles, issues, techniques, and evaluation methods in teaching nursing. Focuses on the development of a variety of teaching strategies and evaluation methods for didactic and clinical settings. Prerequisites: Nursing [NURSE] 7100 and 7110 or instructor's consent.

**NURSE 8864. Curriculum Development in Nursing. 3 Credits.**

Examines theoretical foundations, principles, and issues in curriculum design. Explores systematic evaluation of curriculum at all levels. Prerequisites: Nursing [NURSE] 7100 and 7110 or instructor's consent.

**NURSE 8890. Clinical/Scholarly Project. 1-3 Credit.**

Design, implement and evaluate nursing projects derived from theory, including written report with explanation or justification to support the empirical and/or theoretical basis for the project. Prerequisites: Nursing [NURSE] 7100, 7150, graduate statistics. Graded on a S/U basis only.

**NURSE 8900. Research Practicum in Nursing. 1-3 Credit.**

Selected independent research activities in conjunction with ongoing research programs of faculty. Prerequisites: Nursing [NURSE] 7150, graduate statistics, instructor's consent. Graded on S/U basis only.

**NURSE 8910. Translational Evidence-Based Nursing Practice. 3 Credits.**

Provides essential skills for utilizing research to support practice change: assessing practice based problems, analyzing current evidence, proposing practice changes, and developing plans for implementing evidence-based practice concepts. Prerequisites: Nursing [NURSE] 8100 or faculty consent.

**NURSE 8920. Quality, Safety, and Performance Outcomes. 3 Credits.**

Uses information systems to identify and analyzes patient safety and other clinical issues and recommend system-wide actions and measurement plans that result in safe, effective, efficient, equitable, patient-centered outcomes. Pre/ Corequisite: Nursing [NURSE] 8910. May be repeated for credit.

**NURSE 8930. Health Program Design and Management. 3 Credits.**

Designing, implementing and evaluating effective health programs. Addresses leadership and organizational change issues. Prerequisite: Nursing [NURSE] 8910 or instructor's consent.

**NURSE 8940. Nursing and Health Policy. 3 Credits.**

Designed to explore and critically evaluate the role of nursing and nurse leaders/scholars in health policy development and the organization and financing of health care in response to the health and social needs of the public. Prerequisite: graduate standing.

**NURSE 8950. Teaching Nursing Practicum. 4 Credits.**

Participation in application of principles and methods of teaching, learning, and evaluation to the education of nursing students. Prerequisite: Nursing [NURSE] 8854 and 8864. Graded on S/U basis only.

**NURSE 8954. Distance-Mediated Teaching Nursing Practicum. 4 Credits.**

Faculty-guided application of distance mediated teaching, learning, and evaluation methods with graduate &/or undergraduate nursing students. Prerequisites: Nursing [NURSE] 8854 and 8864 or equivalents. Course graded on S/U basis only. Graduate Standing required.

**NURSE 8960. Leadership in Nursing and Healthcare Systems Practicum. 5 Credits.**

Participation in application of principles and methods of leadership, management, and evaluation to facilitate patient care operations in various settings. Prerequisite: Nursing [NURSE] 8800, 8810, 8820. Graded on an S/U basis only.

**NURSE 8970. APN Role Transition Course. 1 Credit.**

Focus on refinement of knowledge and skills required for successful transition into an Advanced Practice Nursing career. Prerequisite: Nursing [NURSE] 7100, 7150, 7110, and instructor's consent. Concurrent: Nursing [NURSE] 8980.

**NURSE 8980. Advanced Clinical Nursing Practicum. 2-7 Credit.**

Intensive preceptor or faculty-guided clinical experience that synthesizes previous theory and clinical coursework. Refines knowledge and skills required to transition to an autonomous advanced nursing practice role. Prerequisites: Nursing [NURSE] 7110, 8910 or faculty consent. Graded on S/U basis only.

**NURSE 9070. DNP Clinical Residency. 1-6 Credit.**

Intensive clinical experience. Prepare experts in advanced nursing practice and leadership to effectively evaluate practice problems, translate evidence into practice, monitor outcomes, and implement innovative models of care. Prerequisites: Nursing [NURSE] 8930 and 8450 or 8610. May be repeated for credit. Some sections may be offered A/F or S/U only.

**NURSE 9080. DNP Residency Project. 1-3 Credit.**

Final synthesis of DNP coursework culminating in an in-depth practice change project or case analysis impacting a rural or other underserved population or critical healthcare system need. Pre/ Corequisites: Nursing [NURSE] 8930 and 9070. May be repeated for credit. Some sections may be offered A/F or S/U only.

**NURSE 9087. Leadership and Transformational Role Institute. 1 Credit.**

Synthesis of advanced nursing practice knowledge and leadership skills. Prepares DNP graduate to implement an advanced nursing practice role that will result in practice and/or policy change at the local, state, or national levels, Pre/ Corequisites: Nursing [NURSE] 9080 and 9070. May be repeated for credit.

**NURSE 9090. Research in Nursing. 1-99 Credit.**

Original investigation for presentation as thesis or dissertation. Prerequisites: graduate statistics, instructor's consent. Graded on S/U basis only.

**NURSE 9110. Conceptual Structure of Nursing. 3 Credits.**

Conceptualization and theoretical analysis of nursing phenomena; critical evaluation of nursing theories. Prerequisite: Nursing [NURSE] 7100.

**NURSE 9120. Developing Frameworks for Nursing Research. 3 Credits.**

Based on an understanding of the philosophy of science, develop conceptual models and theoretical frameworks for use in nursing research. Prerequisite: Nursing [NURSE] 7100.

**NURSE 9130. Philosophy of Science in Nursing. 3 Credits.**

Overview of foundational concepts of philosophy-history of science; development and evolution of science and philosophical perspectives of nature of science including logical, empiricism, historicism, post-structuralism as related to nursing science/nursing research.

**NURSE 9131. Responsible Conduct of Research in the Health and Social Sciences. 1 Credit.**

(same as Human Development and Family Studies [H\_D\_FS] 9131) This course examines professional research ethics including the rights of human subjects. Graded on S/U basis only. Instructor's permission required. Graduate standing required.

**NURSE 9132. Writing Research Proposals: Skill Building. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 9130) This course teaches the components of writing a research proposal for external funding. Graded on S/U basis only. Instructor's permission required. Graduate Standing Required.

**NURSE 9400. Macro Social Theory. 3 Credits.**

(Same as Social Work [SOC\_WK] 9400) Building on the foundation laid in Social Work [SOC\_WK] 9100, in depth examination of human development and social environment theories appropriate to scientific examination of social welfare practice with formal organizations, interorganizational combinations, communities and larger political entities. Prerequisite: Graduate Standing; consent required. May be repeated for credit.

**NURSE 9410. Advanced Quantitative Methods. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 9200). Study of explanatory and predictive quantitative designs in health-related research, including nested, double-blind, time series, casual models, retrospective cohort; secondary database use will be explored. Prerequisites: Nursing [NURSE] 9131, Advanced Statistics Course.

**NURSE 9420. Qualitative Methods. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 9420) Examines the following selected qualitative research approaches appropriate for the study of nursing phenomena and the extension or modification of scientific knowledge so as to be relevant to nursing: case study research methods, verbal qualitative approaches, and nonverbal qualitative approaches. Prerequisite: Nursing [NURSE] 7150 and doctoral status (or permission of faculty). Graded on A/F basis only.

**NURSE 9430. Measurement Issues. 3 Credits.**

Examines techniques used to estimate the various types reliability and validity of psychological and biological measures of nursing phenomena as well as the appropriate use of existing measures. Prerequisites: Nursing [NURSE] 7150, 9420. Graded on A/F basis only.

**NURSE 9450. Doctoral Seminar: Social Determinants of Health. 3 Credits.**

Doctoral seminar on defining, measuring and conducting research on social determinants of health. Prerequisites: Nursing [NURSE] 9120 and 9410. May be repeated for credit.

**NURSE 9460. Health Behavior Change Research. 3 Credits.**

(Same as Educational, School and Counseling Psychology [ESC PS] 9460) Doctoral seminar focusing on theories, measurement, and methods for conducting health behavior change research. Prerequisite: Nursing [NURSE] 9120, Pre/Co-requisite: Nursing [NURSE] 9410, or faculty consent.

**NURSE 9470. Technology Evaluation in Health Care Systems Research. 3 Credits.**

(same as HMI 9440). Examines technology applications and evaluation methods used to determine outcomes, efficiencies, effectiveness, satisfaction, and cost of using technology. Prerequisites: 6 credit hours of graduate statistics; Prerequisite/Corequisite: NURSE 9410 or faculty consent.

**NURSE 9510. Advances in Health Care Systems. 3 Credits.**

Guided in-depth exploration, analysis, and evaluation of selected nursing and other current literature in health care systems. Prerequisite: Nursing [NURSE] 9110, doctoral standing or instructor's consent.

**NURSE 9520. Advances in Health Restoration and Support. 3 Credits.**

Guided in-depth exploration, analysis, and evaluation of selected nursing and other current literature in health restoration and support. Prerequisite: Nursing [NURSE] 9110, doctoral standing or instructor's consent.

**NURSE 9530. Advances in Health Promotion and Protection. 3 Credits.**

Guided in-depth exploration, analysis, and evaluation of selected nursing and other current literature in health promotion and protection. Prerequisite: Nursing [NURSE] 9110, doctoral standing or instructor's consent.

**NURSE 9540. Seminar in Nursing. 1-99 Credit.**

Course content varies. Prerequisite: graduate standing or instructor's consent. May be repeated to a maximum of six hours.

**NURSE 9550. Meta-Analysis Research. 3 Credits.**

(Same as Human Development and Family Studies [H\_D\_FS] 9550). Examines quantitative synthesis including research questions, search strategies, coding issues, meta-analysis statistical procedures, and interpretation of findings. Emphasizes conceptual understanding and practical methods. Prerequisites: 6 credit hours of graduate statistics courses, Nursing [NURSE] 9410 or graduate level quantitative methods course. Graduate Standing Required.

**NURSE 9560. Qualitative Systematic Reviews. 3 Credits.**

(Same as Social Work [SOC\_WK] 9560 and Human Development and Family Studies [H\_D\_FS] 9560) Examine and carry out elements of qualitative systematic reviews: topic/problem identification, data collection, and analysis. Understand how to limit threats to validity and maximize generalizability. Prerequisite: Nursing [NURSE] 9420 or equivalent.

**NURSE 9700. Social Welfare Policy Seminar. 3 Credits.**

(Same as Social Work [SOC\_WK] 9700) Critical examination of comparative models of social policy development.; preparation of a professional social work policy analysis in the student's area of interest/ specialization that is suitable for submission to an appropriate referred

journal. Graduate Standing required, consent of instructor required. May be repeated for credit.

**NURSE 9710. Advanced Research Practicum in Nursing. 1-6 Credit.**

Supervised experience in nursing research before candidacy. Activities designed by student, faculty mentor, and program committee based on student's research expertise, substantive focus, and probable research trajectory. Includes seminar. Prerequisite: Nursing [NURSE] 9120, 9410, 9420, or 9430; instructor's consent. Graded on S/U basis only.

## Nutrition (NUTRIT)

**NUTRIT 7020. Monogastric Nutrition. 3 Credits.**

(same as AN\_SC7312 and NUTR\_S 7020). Principles of nutrition, feed formulation and recent research in poultry feeding. Graded on A/F basis only. Prerequisites: AN\_SCI 3212 and BIOCHM 3630.

**NUTRIT 7085. Problems in Nutrition. 1-6 Credit.**

Prerequisite: graduate standing.

**NUTRIT 7087. Masters Seminar in Nutrition. 1 Credit.**

Prerequisite: graduate standing.

**NUTRIT 7150. Readings in Nutrition. 1 Credit.**

Readings in current nutrition research. Graded on S/U basis only. Prerequisite: 15 hours work in field and instructor's consent.

**NUTRIT 7350. Nutrition During the Life Cycle. 3 Credits.**

Nutritional, physiological and environmental influences on the aging process of man from conception through senescence. Prerequisite: graduate standing.

**NUTRIT 7390. Medical Dietetics. 3-12 Credit.**

Prerequisite: graduate standing.

**NUTRIT 7650. Amino Acid and Protein Metabolism. 2 Credits.**

Prerequisite: graduate standing.

**NUTRIT 8060. Comparative Nutrition and Metabolism. 2 Credits.**

Prerequisite: graduate standing.

**NUTRIT 8090. Masters Research in Nutrition. 1-99 Credit.**

Investigation in any area of experimental nutrition. Thesis required. Graded on a S/U basis only. Prerequisite: graduate standing.

**NUTRIT 8310. Nutritional Biochemistry of Lipids. 3 Credits.**

(same as NUTR\_S 8310 and AN\_SCI 8431). Current concepts in the nutritional regulations of lipid metabolism. Emphasis on integrating information and interpreting current research data. Prerequisites: BIOCHM 4270 and BIOCHM 4272.

**NUTRIT 8320. Ruminant Nutrition. 3 Credits.**

(same as AN\_SCI 9432). Physiology, chemistry, microbiology, pathology of ruminants. Emphasizes digestion, absorption, metabolism, utilization of nutrients. Lecture, laboratory, assigned readings.

**NUTRIT 8340. Nutrition in Human Health. 3 Credits.**

(same as NUTR\_S 8340). Nutritional aspects of maintaining human health with emphasis on chronic disease prevention. Grades based on classroom participation and four exams. Prerequisites: BIOCHM 4270 and BIOCHM 4272; 4000-level nutrition course.

**NUTRIT 8360. Nutritional Biochemistry of Carbohydrates. 3 Credits.**

(same as AN\_SCI 8360, BIOCHM 8360 and NUTR\_S 8360). Current concepts with in-depth coverage of selected examples of key regulatory steps controlling carbohydrate metabolism; emphasizing molecular

mechanisms. Based entirely on research literature and taught in a tutorial format. Prerequisites: BIOCHM 4270 and BIOCHM 4272 and 4000-level nutrition course and departmental consent.

**NUTRIT 8390. Molecular Biology of Mineral Nutrition. 3 Credits.**

(same as BIOCHM 8390 and NUTR\_S 8390). Current concepts of metal ion transport, intracellular metal trafficking and metal-dependent regulation of gene expression. Based entirely on research literature and taught in a tutorial format. Prerequisites: BIOCHM 4270 and BIOCHM 4272; 4000-level nutrition course.

**NUTRIT 8400. Bioenergetics. 3 Credits.**

(same as AN\_SCI 9441) . Prerequisite: graduate standing.

**NUTRIT 8438. Nutrient Regulation of Gene Expression. 3 Credits.**

(same as AN\_SCI 8438, BIOCHM 8438 and NUTR\_S 8438). Current concepts with in-depth coverage of several minerals that illustrate themes in molecular mineral nutrition. Based entirely on research literature and taught in a tutorial format. Prerequisites: BIOCHM 4270 and BIOCHM 4272; 4000-level nutrition course.

**NUTRIT 8500. Investigations in Experimental Nutrition. 1-6 Credit.**

Written report required. Prerequisite: graduate standing.

**NUTRIT 9087. Doctorate Seminar in Nutrition. 1 Credit.**

Prerequisite: graduate standing.

**NUTRIT 9090. Doctorate Research in Nutrition. 1-99 Credit.**

Investigation in any area of experimental nutrition. Thesis required. Graded on a S/U basis only. Prerequisite: graduate standing.

## **Nutritional Sciences (NUTR\_S)**

**NUTR\_S 1001. Topics in Nutritional Sciences. 1-99 Credit.**

Supervised study in specialized topic of nutritional sciences.

**NUTR\_S 1034. Nutrition, Current Concepts and Controversies. 3 Credits.**

Basic nutrition principles and current controversies are presented. Emphasis on role of nutrition in maintaining health as well as exploring the scientific validity of popular nutrition beliefs. No credit if taken after Nutritional Sciences [NUTR\_S] 2340.

**NUTR\_S 1310. Basic Concepts of World Nutrition. 3 Credits.**

Transdisciplinary approach to nutrition, considering anthropological, physiological, geographical, socioeconomic and psychological elements in world nutrition.

**NUTR\_S 1340. Introduction to Exercise and Fitness. 3 Credits.**

This course is a survey of information in the fields of exercise science and physical fitness. It is a required course for students majoring in Nutrition and Fitness, but it is open to non-majors as well. The goal of the course is to provide students with practical information about exercise and how to be physically fit.

**NUTR\_S 2001. Topics in Nutritional Sciences. 1-99 Credit.**

Supervised study in a specialized topic of Nutritional Sciences.

**NUTR\_S 2085. Problems in Nutritional Sciences. 1-99 Credit.**

Supervised study in a specialized phase of nutritional sciences. Consent required.

**NUTR\_S 2222. Landscape of Obesity. 3 Credits.**

The societal, economic, medical, behavioral, and psychological causes and results of the obesity epidemic and potential modes of treatment and

prevention. Lecture course. Sophomore Standing Required. Graded A-F only.

**NUTR\_S 2340. Human Nutrition I. 3 Credits.**

Basic concepts of normal nutrition related to physiological/ chemical processes; changing nutrient needs during human life cycle, emphasis on adult; some social/psychological influences on dietary habits. Prerequisites: Organic Chemistry, Medical Pharmacology and Physiology [MPP] 3202 or instructor's consent.

**NUTR\_S 2340H. Human Nutrition I - Honors. 3 Credits.**

Basic concepts of normal nutrition related to physiological/chemical processes; changing nutrient needs during human life cycle, emphasis on adult; some social/psychological influences on dietary habits. Includes weekly discussion on controversial issues. Prerequisite: Honors eligibility; Organic Chemistry, Physiology, or instructor's consent. Graded A-F only.

**NUTR\_S 2380. Diet Therapy for Health Professionals. 3 Credits.**

Principles underlying normal nutrition and diet for health and disease. Prerequisites: sophomore standing. Graded on A/F basis only.

**NUTR\_S 2420. Biology of Healthy Living. 2 Credits.**

(same as Physical Therapy [PH\_THR] 2420 and Biomedical Sciences [BIOMED] 2420). Biology of inactivity as a causal factor in chronic disease.

**NUTR\_S 2450. Nutrition Throughout the Life Span. 3 Credits.**

Nutritional requirements, challenges, community nutrition programs, and eating patterns throughout the life span with emphasis on health promotion and disease prevention; Role of beliefs, culture, socio-psychological influences, and economic resources in food selection and nutrition/health status. Lecture/discussion course. Prerequisites: Nutritional Sciences [NUTR\_S] 1034 or 2340 or 2380 or equivalent.

**NUTR\_S 2460. Eating Disorders. 2 Credits.**

Definition, etiology, treatment, and research related to eating disorders: anorexia nervosa, bulimia nervosa and binge eating disorder/obesity. Graded on A/F basis only. Prerequisites: Nutritional Sciences [NUTR\_S] 1034 or higher level nutrition course.

**NUTR\_S 3001. Topics in Nutritional Science. 1-99 Credit.**

Instruction in specific subject matter areas in the field of food science and nutrition.

**NUTR\_S 3085. Problems in Nutritional Sciences. 1-99 Credit.**

Advanced problems in a selected field of food science and nutrition. Consent required.

**NUTR\_S 3131. International Nutrition and Exercise Physiology. 1-6 Credit.**

Immersion into and examination of selected cultures - beliefs, practices, policies and social structures around food, physical activity and health. Prerequisite: instructor's and advisor consent. Graded on A/F basis only.

**NUTR\_S 3280. Food Service I: Introduction to Food Service. 3 Credits.**

Organizational structure and relationships; policy making and implementation; budgeting and cost control; menu as a management tool; sanitation and safety; food preparation; and food delivery systems. Prerequisite: Hospitality Management [HSP\_MGMT] 1995.

**NUTR\_S 3290. Food Service I: Supervised Practice Experience. 1 Credit.**

A practicum designed to expose the student to concepts of quantity food production, evaluation of products and resources, personnel administration and application of food microbiological principles. 4 hours

of supervised practice per week. Prerequisites: concurrent enrollment in Nutritional Sciences [NUTR\_S] 3280; open to students enrolled in the Coordinated Program in Dietetics only.

**NUTR\_S 3360. Nutritional Assessment Supervised Practice Experience. 2 Credits.**

Supervised practice to develop skills in screening individuals for nutrition risk; use of dietary, anthropometric, laboratory, clinical and sociocultural criteria to assess nutritional status of individuals, 8 hours of supervised practice per week. Prerequisites: concurrently enrolled in Nutritional Sciences [NUTR\_S] 4360; Open to students enrolled in the Coordinated Program in Dietetics only.

**NUTR\_S 3370. Nutrition Therapy I: Supervised Practice Experience. 3 Credits.**

Practice and application of principles of nutrition care for selected disease states. 12 hours of supervised practice per week. Prerequisites: Concurrently enrolled in Nutritional Sciences [NUTR\_S] 4370; Open to students enrolled in the Coordinated Program in Dietetics only.

**NUTR\_S 3390. Teaching and Counseling Techniques in Nutrition. 2 Credits.**

Principles and theories of learning; Resources, methods and techniques for teaching food/nutrition principles and dietary guidelines; Group dynamics and facilitation; Introduction to counseling theories and methods used in nutrition care of individuals. Lecture course. Prerequisites: Psychology [PSYCH] 1000 and Nutritional Sciences [NUTR\_S] 2340.

**NUTR\_S 3400. Teaching & Counseling Techniques in Nutr. Supervised Practice Exp. 1 Credit.**

Skill development and practice in counseling individuals for health promotion and disease prevention and the teaching of food and nutrition topics to groups. 4 hours of supervised practice per week. Prerequisites: concurrent enrollment in Nutritional Sciences [NUTR\_S] 3390; Open to students enrolled in the Coordinated program in Dietetics only.

**NUTR\_S 3590. Community Nutrition Supervised Practice Experience. 1 Credit.**

A practicum which explores and applies the concepts and techniques of nutrition programming in a community setting. 4 hours of supervised practice per week. Prerequisites: Nutritional Sciences [NUTR\_S] 2590; Open to students enrolled in the Coordinated Program in Dietetics only.

**NUTR\_S 3800. Prevention and Care of Athletic Injury. 3 Credits.**

Theory, practice in prevention, emergency care, rehabilitation of injuries encountered in vigorous games. Prerequisite: Pathology and Anatomical Sciences [PTH\_AS] 2201.

**NUTR\_S 3810. Advanced Athletic Training. 3 Credits.**

Advanced study in areas of prevention, evaluation, care, and treatment and rehabilitation of athletic injuries at high school and college level. Graded on A/F basis only. Prerequisite: Nutritional Sciences [NUTR\_S] 3800 and instructor's consent.

**NUTR\_S 3900. Field Training in Nutritional Sciences. 1-99 Credit.**

Prerequisites: junior or senior standing and instructor's consent.

**NUTR\_S 4001. Topics in Nutrition and Exercise Physiology. 1-3 Credit.**

Instruction in specific subject matter areas in the field of nutrition science and exercise physiology.

**NUTR\_S 4020. Monogastric Nutrition. 3 Credits.**

(same as Animal Science [AN\_SCI] 4312 and Nutrition [NUTRIT] 7020). Principles of nutrition, feed formulation and recent research in

poultry feeding. Graded on A/F basis only. Prerequisite: Animal Science [AN\_SCI] 3212 and Biochemistry [BIOCHM] 3630.

**NUTR\_S 4200. Sports Performance and Conditioning. 3 Credits.**

Course utilizes scientific theory and applied instruction to teach procedures, techniques, and modalities used to improve physical sports performance. Prerequisites: Physiology and Anatomy, Kinesiology. Junior or Senior senior standing required. Graded on A/F basis only.

**NUTR\_S 4280. Food Service II: Advanced Food Service Management. 1 Credit.**

Issues related to marketing and financial control in the foodservice sector. Lecture course. Prerequisite: Nutritional Sciences [NUTR\_S] 3280, NUTR S 3290.

**NUTR\_S 4290. Food Serv. II: Adv. Food Service Manage. Supervised Practice Exp. 2 Credits.**

A practicum tailored to apply marketing and budgetary principles in the foodservice industry. 8 hours of supervised practice per week. Prerequisite: Concurrent enrollment in Nutritional Sciences [NUTR\_S] 4280; Open to students admitted to the Dietetics program.

**NUTR\_S 4330. Human Nutrition II Laboratory. 2 Credits.**

A techniques course in nutrition, usually taken concurrently with Nutritional Sciences [NUTR\_S] 4340. Prerequisites: NUTR\_S\_2340, Biochemistry and instructor's consent.

**NUTR\_S 4340. Human Nutrition II Lecture. 3 Credits.**

Physiological and biochemical aspects of nutrition; functions of methods of measuring nutritional status; various aspects of applied nutrition. Continuation of Nutritional Sciences [NUTR\_S] 2340. Prerequisites: NUTR\_S\_2340, Biochemistry or instructor's consent.

**NUTR\_S 4360. Nutritional Assessment. 3 Credits.**

Introduction to the nutrition assessment process. The identification of dietary, anthropometric, laboratory, clinical and sociocultural parameters used to assess nutritional status of individuals. Lecture course. Prerequisites: Psychology [PSYCH] 1000, Nutritional Sciences [NUTR\_S] 2340.

**NUTR\_S 4370. Nutrition Therapy I. 3 Credits.**

In-depth study of physiological/biochemical changes in selected disease states (cardiovascular disease, rehabilitation, diabetes and cancer); development of principles underlying nutrition therapy. Lecture course. Prerequisites: Nutritional Sciences [NUTR\_S] 4360.

**NUTR\_S 4380. Nutrition Therapy II. 2 Credits.**

Evaluation, design and monitoring of the nutrition care of complex health disorders such as renal disease, trauma, and multi-system organ failure; emphasis on nutrition support (enteral and parenteral nutrition). Lecture course. Prerequisites: Nutritional Sciences [NUTR\_S] 4370.

**NUTR\_S 4381. Nutrition Therapy II: Supervised Practice Experience. 4 Credits.**

Practice in the nutrition care of complex health disorders with emphasis on nutrition support. 16 hours of supervised practice per week. Prerequisites: concurrent enrollment in Nutritional Sciences [NUTR\_S] 4380; Open to students admitted to Dietetics program only.

**NUTR\_S 4390. Issues in Dietetic Practice. 1 Credit.**

Lectures and discussions focus on issues and trends in dietetics. Discussions are used to encourage the development of skills and attitudes which foster life-long professional learning. Lecture/discussion course. Prerequisite: Nutritional Sciences [NUTR\_S] 4950 and 4380; or instructor's consent.



**NUTR\_S 4590. Community Nutrition. 3 Credits.**

Public health nutrition and chronic disease prevention, food security, nutrition programs and food access, public policy, sustainable agriculture and food production systems, cultural food practices, needs assessment. Prerequisites: Nutrition course or instructor's consent. Graded on A/F basis only.

**NUTR\_S 4850. Physiology of Exercise. 3 Credits.**

Effects of exercise on the human organism; physiologic capacity and limitation for activity; role of exercise in health and fitness. Prerequisite: Medical Pharmacology and Physiology [MMP] 3202, Pathology and Anatomical Sciences [PTH\_AS] 2201 recommended.

**NUTR\_S 4860. Exercise Prescription. 3 Credits.**

Course investigates theory and methods of testing and prescribing exercise for circulatory fitness, body composition, muscle strength, joint and muscle ranges in motion, and posture. Prerequisites: Medical Pharmacology and Physiology [MPP] 3202 or 3333 and 3337, Pathology and Anatomical Sciences [PTH\_AS] 2201 and Nutritional Sciences [NUTR\_S] 4850 or concurrent. Restricted from Pre-Nutrition and Fitness majors.. Graded on A/F basis only.

**NUTR\_S 4940. Internship in Nutritional Science and Exercise Physiology. 1-6 Credit.**

Combines study, observation and employment in an area of exercise physiology and/or nutrition. Written reports, faculty evaluation . Prerequisites: GPA >3.0; 90 hours including four core courses in nutrition and exercise physiology and Nutritional Sciences [NUTR\_S] 4850; instructors consent.

**NUTR\_S 4950. Capstone: Research in Nutritional Sciences. 2 Credits.**

Introduction to research, including the types of basic, clinical, and outcomes-based research. Defining research problems related to nutrition and exercise sciences, developing hypotheses, reviewing scientific literature, writing research protocols, analyzing data. Lecture course. Prerequisites: Nutritional Sciences [NUTR\_S] 2340, statistics course, and senior standing or instructor's consent.

**NUTR\_S 4951. Nutrition Research Communication. 1 Credit.**

Analyze and interpret data; present results of a research study in manuscript and seminar presentation formats. Emphasis on effective communication of nutrition research to scientific and lay audiences. Prerequisite: Nutritional Sciences [NUTR\_S] 4950 or instructor's consent; Dietetics: 4 hours of SPE per week. Graded on A/F basis only.

**NUTR\_S 4960. Readings in Nutritional Sciences. 1-99 Credit.**

Prerequisites: 8 hours of course work in field of subject and instructor's consent.

**NUTR\_S 4970. Nutrition Capstone: Sports Nutrition. 2 Credits.**

Integration of research literature with knowledge from previous coursework, emphasis on sports nutrition research, nutrient requirements of athletes, critical evaluation of ergogenic aids. Prerequisites: Statistics [STAT], Nutritional Sciences [NUTR\_S] 2340, Physiology, Senior Standing, open to Nutrition and Fitness majors only. Graded on A/F basis only.

**NUTR\_S 4975. Practice of Dietetics Supervised Practice Experience. 10 Credits.**

Supervised practice in providing quality nutrition services in clinical, community, management and specialty settings. 40 hours of supervised practice per week. Prerequisites: Nutritional Science [NUTR\_S] 3590,

4280, 4290, 4380, 4381, and 4590; Open to students admitted to the Dietetics Program only.

**NUTR\_S 7001. Topics in Nutritional Science. 1-99 Credit.**

Instruction in specific subject matter areas in the field of food science and nutrition. Prerequisite: graduate standing.

**NUTR\_S 7020. Monogastric Nutrition. 3 Credits.**

(same as Animal Science [AN\_SCI] 7312 and Nutrition [NUTRIT] 7020). Principles of nutrition, feed formulation and recent research in poultry feeding. Graded on A/F basis only. Prerequisite: graduate standing Animal Science [AN\_SCI] 3212 and Biochemistry [BIOCHM] 3630.

**NUTR\_S 7085. Problems in Nutritional Sciences. 1-99 Credit.**

Advanced problems in a selected field of food science and nutrition. Prerequisite: graduate standing.

**NUTR\_S 7150. Readings in Nutritional Sciences. 1-99 Credit.**

Prerequisites: 15 hours course work in field of subject and instructor's consent.

**NUTR\_S 7200. Sports Performance and Conditioning. 3 Credits.**

Course utilizes scientific theory and applied instruction to teach procedures, techniques, and modalities used to improve physical sports performance. Prerequisites: Physiology and Anatomy, Kinesiology; junior/senior standing. Graded on AF basis only.

**NUTR\_S 7330. Human Nutrition II Laboratory. 2 Credits.**

A techniques course in nutrition, usually taken concurrently with Nutritional Sciences [NUTR\_S] 4340. Prerequisites: Nutritional Sciences [NUTR\_S] 2340, Biochemistry and instructor's consent.

**NUTR\_S 7340. Human Nutrition II Lecture. 3 Credits.**

Physiological and biochemical aspects of nutrition; functions of methods of measuring nutritional status; various aspects of applied nutrition. Continuation of Nutritional Sciences [NUTR\_S] 2340. Prerequisites: graduate standing and Nutritional Sciences [NUTR\_S] 2340, Biochemistry [BIOCHM] or instructor's consent.

**NUTR\_S 7360. Nutritional Assessment. 3 Credits.**

Introduction to the nutrition assessment process. The identification of dietary, anthropometric, laboratory, clinical and sociocultural parameters used to assess nutritional status of individuals. Lecture course. Prerequisites: graduate standing and Psychology [PSYCH] 1000, Nutritional Science [NUTR\_S] 2340.

**NUTR\_S 7370. Nutritional Therapy I. 3 Credits.**

In-depth study of physiological/biochemical changes in selected disease states (cardiovascular disease, rehabilitation, diabetes and cancer); development of principles underlying nutrition therapy. Lecture course. Prerequisites: graduate standing and Nutritional Science [NUTR\_S] 4360.

**NUTR\_S 7380. Nutrition Therapy II. 2 Credits.**

Evaluation, design and monitoring of the nutrition care of complex health disorders such as renal disease, trauma, and multi-system organ failure; emphasis on nutrition support (enteral and parenteral nutrition). Lecture course. Prerequisites: Nutritional Science [NUTR\_S] 4370.

**NUTR\_S 7500. Research in Nutritional Sciences. 1-99 Credit.**

Original investigations, usually in connection with one of the research projects of Agricultural Experiment Station. Written report required. Prerequisite: graduate standing.

**NUTR\_S 7590. Community Nutrition. 3 Credits.**

Public health nutrition and chronic disease prevention, food security, nutrition programs and food access, public policy, sustainable agriculture and food production systems, cultural food practices, needs assessment.

Prerequisites: Nutrition course or instructor's consent. Graded on A/F basis only.

**NUTR\_S 7840. Cardiovascular Health and Fitness. 3 Credits.**

Physiology underlying best methods for obtaining and maintaining cardiovascular health and fitness. Includes exercise and weight control, plasma lipids, energy metabolism, cardiovascular dynamics, and recent research findings. Prerequisite: graduate standing.

**NUTR\_S 7950. Research in Dietetics. 2 Credits.**

Introduction to research, including the relationship of basic, clinical, and outcomes-based research to dietetics practice. Defining research problems in a dietetics practice setting, developing hypotheses, reviewing scientific literature, writing research protocols, analyzing data. Lecture course. Prerequisites: statistics course, graduate standing or instructor's permission.

**NUTR\_S 7970. Sports Nutrition. 2 Credits.**

Integration of research literature with knowledge from previous coursework, emphasis on sports nutrition research, nutrient requirements of athletes, critical evaluation of ergogenic aids. Prerequisites: Statistics [STAT], Nutritional Sciences [NUTR\_S] 2340, Physiology; graduate standing, instructor's consent. Not open to Pre-Nutrition and Fitness students. Graded on A/F basis only.

**NUTR\_S 8001. Topics in Nutritional Sciences. 1-3 Credit.**

Instruction in specific subject matter areas in the field of nutrition science and exercise physiology. May be repeated for credit. Graded on A/F basis only.

**NUTR\_S 8030. Etiology of Obesity. 3 Credits.**

This course is designed to provide an understanding of the cause and implications of human obesity. General topic areas covered will include: methodologies of obesity research, physiology of obesity, behavioral and environmental factors influencing obesity, obesity and disease, therapeutic approaches to obesity, and emerging topics in obesity. The structure of this course will be mixture of lectures and interactive discussions/reviews of primary research articles in these areas. Students will be expected to present and critically evaluate research papers relevant to the field of obesity. Prerequisite: NUTR\_S 7340.

**NUTR\_S 8085. Problems in Nutritional Sciences. 1-99 Credit.**

Individual studies include a minor research problems. Prerequisite: graduate standing.

**NUTR\_S 8087. Masters Seminar in Nutritional Sciences. 1 Credit.**

Seminar features expert presentations of current research and issue-based applications that represent the breadth of nutritional sciences. Graduate Standing Required. Graded on S/U basis only.

**NUTR\_S 8090. Masters Research in Nutritional Sciences. 1-99 Credit.**

Original investigation of advanced nature, leading to thesis dissertation. Graded on a S/U basis only. Prerequisite: graduate standing.

**NUTR\_S 8310. Nutritional Biochemistry of Lipids. 3 Credits.**

(same as Animal Science [AN\_SCI] 8431 and Nutrition [NUTRIT] 8310). Current concepts in the nutritional regulation of lipid metabolism. Emphasis on integrating information and interpreting current research data. Prerequisites: Biochemistry [BIOCHM] 4270 and 4272.

**NUTR\_S 8340. Nutrition in Human Health. 3 Credits.**

(same as Nutrition [NUTRIT] 8340). Nutritional aspects of maintaining human health with emphasis on chronic disease prevention. Grades based on classroom participation and four exams. Prerequisites: Biochemistry [BIOCHM] 4270 and 4272; 4000-level nutrition course.

**NUTR\_S 8360. Nutritional Biochemistry I. 3 Credits.**

(same as Nutrition [NUTRIT] 8360 and Biochemistry [BIOCHM] 8360). Provides a critical understanding of current developments in lipid metabolism in animals and humans, particularly as it relates to nutrition and health. Prerequisite: BIOCHM 4270 and 4272; at least one 4000 level nutrition course.

**NUTR\_S 8390. Molecular Biology of Mineral Nutrition. 3 Credits.**

(same as Nutrition [NUTRIT] 8390 and Biochemistry [BIOCHM] 8390). Current concepts of metal ion transport, intracellular metal trafficking and metal-dependent regulation of gene expression. Based entirely on research literature and taught in a tutorial format. Prerequisites: Biochemistry [BIOCHM] 4270 and 4272; 4000-level nutrition course.

**NUTR\_S 8438. Nutrient Regulation of Gene Expression. 3 Credits.**

(same as Animal Science [AN\_SCI] 8438, Biochemistry [BIOCHM] 8438 and Nutrition [NUTRIT] 8438). Current concepts with in-depth coverage of several minerals that illustrate themes in molecular mineral nutrition. Based entirely on research literature and taught in a tutorial format. Prerequisites: BIOCHM 4270 and 4272; 4000-level nutrition course.

**NUTR\_S 8850. Advanced Exercise Physiology. 3 Credits.**

Lectures, laboratory experiences, and readings in current literature to provide reasonable depth in selected areas of physiology as applied to activity and health. Prerequisites: Nutritional Science [NUTR\_S] 4850 and Chemistry [CHEM].

**NUTR\_S 8870. Exercise Metabolism. 3 Credits.**

Review of major metabolic pathways and the effect of exercise upon them. Special topics include indirect calorimetry, EPOC, anaerobic threshold; weight control, ergogenic aids, and exercise nutrition. Prerequisites: Nutritional Science [NUTR\_S] 4850 and Chemistry [CHEM].

**NUTR\_S 9087. Doctorate Seminar in Nutritional Sciences. 1 Credit.**

Seminar features expert presentations of current research and issue-based topics that represent the breadth of nutritional sciences. Graduate Standing Required. Graded on S/U basis only.

**NUTR\_S 9090. Doctorate Research in Nutritional Sciences. 1-99 Credit.**

Original investigation of advanced nature, leading to thesis dissertation. Graded on a S/U basis only. Prerequisite: graduate standing.

## Obstetrics And Gynecology (OB\_GYN)

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**OB\_GYN 6004. Obstetrics/Gynecology Clerkship. 6-10 Credit.**

Obstetrics/Gynecology Clerkship.

**OB\_GYN 6014. Rural Obstetrics/Gynecology Clerkship. 6-10 Credit.**

Rural Obstetrics/Gynecology Clerkship.

**OB\_GYN 6104. Remediation 6004 OB/GYN Clerkship. 6 Credits.**

OB/GYN Clerkship Remediation. Prerequisite: 6004 OB/GYN Clerkship, received unsatisfactory grade.

**OB\_GYN 6311. ABS OB/Gynecology Mechanism of Disease. 5-10 Credit.**

ABS OB/Gynecology Mechanism of Disease.

**OB\_GYN 6313. ABS OB/Gynecology Research. 5 Credits.**

ABS OB/Gynecology Research.

**OB\_GYN 6315. ABS OB/Gynecology Research and Review. 5-10 Credits.**

ABS OB/Gynecology Research and Review.

**OB\_GYN 6563. OB/GYN Clinical Reproductive Endocrinology. 5 Credits.**

OB/GYN Clinical Reproductive Endocrinology.

**OB\_GYN 6564. OB/GYN Reproductive Endocrinology Research. 5 Credits.**

OB/GYN Reproductive Endocrinology Research.

**OB\_GYN 6570. Gynecologic Endoscopy - St. Luke's. 5 Credits.**

Gynecologic Endoscopy - St. Luke's.

**OB\_GYN 6571. Clinical Reproductive Endocrinology and Infertility - St. Luke's. 5 Credits.**

Clinical Reproductive Endocrinology and Infertility - St. Luke's.

**OB\_GYN 6572. OB/GYN Ultrasonography - St. Luke's. 5 Credits.**

OB/GYN Ultrasonography - St. Luke's.

**OB\_GYN 6573. Maternal-Fetal Medicine and Ultrasound - St. Luke's. 5 Credits.**

Maternal-Fetal Medicine and Ultrasound - St. Luke's.

**OB\_GYN 6574. Clinical GYN Oncology/Pathology - St. Luke's. 5 Credits.**

Clinical GYN Oncology/Pathology - St. Luke's.

**OB\_GYN 6575. Obstetrics/Gynecology - St. Luke's. 5 Credits.**

Obstetrics/Gynecology - St. Luke's.

**OB\_GYN 6580. Obstetrics/Gynecology-Moberly Regional. 5 Credits.**

Obstetrics/Gynecology-Moberly Regional.

**OB\_GYN 6583. Obstetrics/Gynecology Offsite Advanced Elective. 5 Credits.**

Obstetrics/Gynecology Offsite Advanced Elective.

**OB\_GYN 6765. OB/GYN - Rural. 5 Credits.**

OB/GYN - Rural.

**OB\_GYN 6766. Gynecology Rural Elective. 5 Credits.**

Students will build upon their gynecologic examinations skills and their knowledge of both the common and more unusual gynecologic conditions that they obtain during other clerkships. Prerequisites: Obstetrics and Gynecology [OB\_GYN] 6004, Surgery [SURGRY] 6006.

**OB\_GYN 6865. Maternal-Fetal Medicine Selective. 5 Credits.**

Prerequisites: Ob-Gyn Clerkship. Goals/Objectives: To expose the student to high-risk obstetrical experiences in the Maternal Fetal Medicine division. All obstetrical selectives are done at Women's and Children's Hospital.

**OB\_GYN 6866. Obstetrical. 5 Credits.**

Prerequisites: Ob-Gyn Clerkship. Goals/Objectives: To provide the student with additional obstetrical experience in the Labor and delivery suite. All obstetrical electives are done at the Missouri Ob/Gyn Associates Clinic and Women's and Children's Hospital. Core reading for this rotation will include Obstetrics, Normal and Problem Pregnancies, latest edition, edited by Gabbe, Niebyl and Simpson. Evaluations: The student will be graded on their ward performance. An evaluation for this rotation will be completed by the appropriate faculty and resident physicians. Notes: While on this rotation students will have exposure to various faculty members, residents, and fellow medical students. Students will participate in the evaluation of patients on labor and delivery including those presenting for evaluation of first trimester problems and labor

evaluations. Some participation in operative procedures and labor management is expected. Students will have exposure to antenatal testing and ultrasonography including the interpretation of ultrasounds and limited participation in genetic counseling and invasive ante-partum diagnostic procedures is expected. Night call will be required and can be worked into the core rotation's student call schedule. Teaching will be on an ongoing bases with Dr. Floyd keeping daily routine with the students expected to participate in management decisions.

**OB\_GYN 6867. Obstetrical/Gynecological Outpatient. 5 Credits.**  
Obstetrical/Gynecological Outpatient.

**OB\_GYN 6960. Gynecologic/Oncology Surgery. 5 Credits.**

Prerequisites: Ob-Gyn Clerkship. Goals/Objectives: To provide the student with additional surgical and gynecological clinical experience. All gynecologic surgical electives are performed at Ellis Fischel Cancer Center and the University Hospital. Evaluations: An evaluation for this rotation will be completed by the elective chairmen and appropriate resident physicians. The students will be graded on their clinic, ward, and operating room performance. Notes: While on this rotation, students will have exposure to faculty members, three residents, and other fellow medical students. They will have the opportunity to assist in gynecologic oncology surgical cases, attend tumor clinics where they will encounter various procedures such as colposcopies, cryotherapy, and cervical and endometrial biopsies. A copy of a representative weekly schedule is available from the department student coordinator. In addition, students will be required to make two ten minute presentations with audio-visual aids on assigned topics. The students will not take night call, but are expected to attend patient rounds on weekdays and weekends with the residents. The department also holds conferences on Tuesdays and Thursdays which are to be attended. Core reading for this rotation will include Clinical Gynecologic Oncology by DiSaia and Creasman.

**OB\_GYN 6964. Obstetrics/Gynecology Offsite Advanced Selective. 5 Credits.**

Obstetrics/Gynecology Offsite Advanced Selective.

## **Occupational Therapy (OC\_THR)**

**OC\_THR 1000. Introduction to Occupational Therapy. 1 Credit.**

Introductory course to provide students information about the occupational therapy profession. Registered therapists lecture on clinical aspects. Students participate in discussions on program requirements, placement, and trends in the profession.

**OC\_THR 2001. Topics in Occupational Therapy. 1-99 Credit.**

Organized study of selective topics in occupational therapy. Particular topics and credit hours may vary from semester to semester.

Prerequisites: freshman or sophomore standing; instructor's consent. Repeatable upon consent of department.

**OC\_THR 2085. Problems in Occupational Therapy. 1-99 Credit.**

Independent investigation leading to the completion of a project or paper. Prerequisite: freshman or sophomore standing; instructor's consent.

**OC\_THR 4001. Topics in Occupational Therapy. 1-99 Credit.**

Organized study of selective topics in occupational therapy. Particular topics and credit hours may vary from semester to semester.

Prerequisite: junior standing; instructor's consent. Repeatable upon consent of department.

**OC\_THR 4060. Professional Issues. 1 Credit.**

Introduction to the structures of the profession including professional association, philosophical and ethical perspectives and preparation for client contact. Includes experiential instruction in infection control. Prerequisite: acceptance into the occupational therapy program. Graded on A/F basis only.

**OC\_THR 4085. Problems in Occupational Therapy. 1-99 Credit.**

Independent investigation leading to the completion of a project or paper. Prerequisite: junior standing; instructor's consent. Repeatable upon consent of department.

**OC\_THR 4220. Clinical Kinesiology. 3 Credits.**

(same as Physical Therapy [PH\_THR] 4250). This course for occupational therapy students examines the musculoskeletal system with special emphasis in body movements and the application of laws and biomechanical principles that govern movement in order to select and perform effective occupation-based treatment. Prerequisites: acceptance into the occupational therapy program. Graded on A/F basis only.

**OC\_THR 4240. Applied Neurophysiology for Allied Health Students. 3 Credits.**

(same as Communicative Science and Disorders [CSD] 4430 and Physical Therapy [PH\_THR] 4240). Principles of basic neurophysiology, emphasizing correlation of structure and function of the nervous system. Graded on A/F basis only.

**OC\_THR 4270. Clinical Pathophysiology. 3 Credits.**

(same as Physical Therapy [PH\_THR] 4270) Interdisciplinary and case-based examination of the pathophysiology, prevention and general health management of disease/injury across the lifespan encountered in occupational and physical therapy practice. Prerequisite: successful completion of prior professional coursework. Graded on A/F basis only.

**OC\_THR 4310. Foundations of Occupational Therapy. 4 Credits.**

History, contemporary practice, conceptual foundations, professional organizations and official documents of the OT profession are presented. Activity analysis, adaptation, and assistive technology are introduced in the context of promoting health and occupational participation. Prerequisite: Pathology and Anatomical Science [PTH\_AS] 4222 with a grade of "C" or better. Admission to the OT professional program required. Graded on A-F only basis.

**OC\_THR 4350. Rehabilitation Practice. 4 Credits.**

Analysis of major disability areas from an occupational perspective. Administration and interpretation of assessments and application of treatment theories and approaches for deficits in movement, sensation, cognition and perception. Must be admitted to the Occupational Therapy Professional Program. Graded on A/F basis only.

**OC\_THR 4390. Lifespan Assessment. 3 Credits.**

Introduction to occupational therapy evaluation: interviewing, screening, assessment, and documentation. Overview of the characteristics of instruments and interpretation of data. Basic evaluation skills in occupational therapy across the lifespan are introduced. Graded on A/F basis only.

**OC\_THR 4420. Lifespan Occupations I. 2 Credits.**

Overview of typical development from infancy through adolescence from an occupational perspective. Emphasis on the impact of personal and contextual factors on occupational development in children and adolescents. Prerequisite: Admission to Occupational Therapy professional program and satisfactory completion of all previous

professional program coursework (C or better for Undergraduates). Graded on A/F basis only.

**OC\_THR 4422. Fieldwork I - Children. 1 Credit.**

Development of clinical observation skills via on-site observation of children with typical and atypical development. Opportunities to gather and organize data, plan and implement activities, and develop therapeutic relationships with children and their care providers. Prerequisites: Admission to Occupational Therapy professional program and satisfactory completion of all previous professional program coursework (C or better for undergraduates). Graded on S/U basis only.

**OC\_THR 4450. Pediatric Practice. 4 Credits.**

Lecture and laboratory course designed which addresses OT pediatric frames of reference and theories. Common conditions seen in OT practice as well as interventions such as feeding, positioning, facilitation of movement and sensory strategies are also addressed. Prerequisite: Admission to the OT professional program. Graded on A/F basis only.

**OC\_THR 4520. Fundamentals of Occupational Therapy. 4 Credits.**

This course will provide an overview of disability across the lifespan, including personal and professional interactions. Professional values, ethics and advocacy are also emphasized. Restricted to students currently enrolled in the Occupational Therapy Program. Graded on A/F basis only.

**OC\_THR 4620. Lifespan Occupations II. 2 Credits.**

Overview of biopsychosocial development and the aging process from young adulthood through older adulthood from an occupational perspective. Emphasis on the impact of client and contextual factors on occupational development and loss of occupations throughout the adult lifespan. Admission to the Occupational Therapy professional program and satisfactory completion of all previous professional program coursework (C or better for undergraduate; B or better for graduate). Graded on A/F basis only.

**OC\_THR 4622. Fieldwork I Older Adults. 1 Credit.**

Development of evaluation and intervention skills via on-site interaction with older adults in a residential facility. Opportunities to gather data, plan/implement activities, document client performance, and develop therapeutic relationships with older adults and care providers. Admission to the Occupational Therapy professional program and satisfactory completion of all previous professional program coursework (C or better for undergraduate; B or better for graduate). Graded on S/U basis only.

**OC\_THR 4650. Lifespan Interventions. 4 Credits.**

This course provides a foundational overview of common treatment theories and frames of reference that guide intervention planning across the lifespan. Prerequisite: Occupational Therapy [OC\_THR] 4310 and 4520. Graded on A/F basis only. Restricted to students who are currently enrolled in the Occupational Therapy Program.

**OC\_THR 4670. Hand and Upper Extremity Intervention. 2 Credits.**

To gain entry level skills needed to evaluate and treat common upper extremity conditions, including acute injuries and cumulative trauma disorders. Prerequisites: Occupational Therapy [OC\_THR] 4222/7222, 4220/7220, 4390/7390. Graded on A-F basis only.

**OC\_THR 4740. Neurophysiology II - Seminar: Advanced Concepts in Neuroscience. 1 Credit.**

This advanced seminar involves a review of neuro-based literature with a focus on translating neuroscience concepts and research findings into occupational therapy. Restricted to Occupational Therapy students only. Graded on S/U basis only.

**OC\_THR 4750. Cognition Across the Lifespan. 2 Credits.**

This course introduces students to theoretical models, assessment, and treatment in cognitive rehabilitation. Restricted to Occupational Therapy Majors. Graded on A/F basis only.

**OC\_THR 4770. Community-Based Practice. 3 Credits.**

Focus on role of occupational therapy in prevention, health and wellness. Program development and evaluation completed through community needs assessment and completion of health promotion project. Prerequisite: acceptance into major and completion of program year 1. Graded on A-F only basis.

**OC\_THR 4920. Clinical Documentation. 2 Credits.**

Development of observation and assessment skills related to effective documentation of occupational therapy services. Emphasizes exposure to various clinical settings, and third party payers, and legislative policies impacting documentation. Graded on A/F basis only. Restricted to students admitted to the professional program.

**OC\_THR 4943. Fieldwork: Clinical. 1 Credit.**

Clinical experience in occupational therapy settings. Emphasis on classroom to clinical transition. Exposure to the occupational therapy process; assessment, planning, implementation. Emphasis on professional communication and observational skills. Prerequisite: completion of 1st semester in major in professional curriculum; junior standing. Graded on A/F basis only.

**OC\_THR 4960. Readings in Occupational Therapy. 1-99 Credit.**

Directed readings of the literature and research in occupational therapy. Prerequisite: junior standing, instructor's consent. Repeatable upon consent of department.

**OC\_THR 4970. Research Methods. 3 Credits.**

This course will use writing to explore basic concepts in research design and analysis. Restricted to Occupational Therapy Majors. Graded on A/F basis only.

**OC\_THR 7000. Research Project. 2 Credits.**

Supervised experience in scientific investigation. In this course students will develop hypotheses, establish protocols/procedures, collect/analyze data, and interpret results.

**OC\_THR 7001. Topics in Occupational Therapy. 1-99 Credit.**

Organized study of selected topics in occupational therapy. Particular topics and credit hours may vary from semester to semester. Repeatable upon consent of department. Course may be offered on S/U or A/F basis. Prerequisite: graduate standing.

**OC\_THR 7005. Research Project-Mentor Hours. 1 Credit.**

Hours spent working with research mentor on research proposal. Emphasis on understanding project, designing project and collecting data for project. Must be taken in conjunction with Occupational Therapy [OC\_THR] 7000. Graded on S/U basis only. May be repeated for credit.

**OC\_THR 7060. Professional Issues. 1 Credit.**

Introduction to the structures of the profession including professional associations, philosophical and ethical perspectives, the meaning of occupation and preparation for client contact. Includes experiential instruction in surface anatomy and infection control. Acceptance into the occupational therapy program. Graduate standing required. Graded on A-F basis only.

**OC\_THR 7085. Problems in Occupational Therapy. 1-99 Credit.**

Independent investigation leading to the completion of a project or paper. Repeatable upon consent of department. May be offered on A/F or S/U basis. Prerequisite: graduate standing.

**OC\_THR 7220. Clinical Kinesiology. 3 Credits.**

(same as Physical Therapy [PH\_THR] 7250). This course for occupational therapy students examines the musculoskeletal system with special emphasis in body movement and the application of laws and biomechanical principles that govern movement in order to select and perform effective occupation-based treatment. Acceptance into the occupational therapy program. Graduate Standing Required. Graded on A-F basis only.

**OC\_THR 7240. Applied Neurophysiology for the Allied Health Student. 3 Credits.**

(same as Physical Therapy [PH\_THR] 7240). Principles of basic neurophysiology, emphasizing correlation of structure and function of the nervous system. Graded on A/F basis only. Graduate standing required.

**OC\_THR 7270. Clinical Pathophysiology. 3 Credits.**

(same as Physical Therapy [PH\_THR] 7270). Interdisciplinary and case-based examination of the pathophysiology, prevention and general health management of disease/injury across the lifespan encountered in occupational and physical therapy practice. Admission to the OT Professional Program required. Graded on A-F basis only.

**OC\_THR 7310. Foundations of Occupational Therapy. 4 Credits.**

History, contemporary practice, conceptual foundations, professional organizations and official documents of the OT profession are presented. Activity analysis, adaptation, and assistive technology are introduced in the context of promoting health and occupational participation. Prerequisite: Pathology and Anatomical Science [PTH\_AS] 4222 with a grade of "C" or better. Admission to the OT professional program required. Graded on A/F only basis.

**OC\_THR 7350. Rehabilitation Practice. 4 Credits.**

Analysis of major disability areas from an occupational perspective. Administration and interpretation of assessments and application of treatment theories and approaches for deficits in movement, sensation, cognition, and perception. Prerequisite: Admission to the Occupational Therapy professional program. Graded on A/F basis only. Graduate standing required.

**OC\_THR 7390. Lifespan Assessment. 3 Credits.**

Introduction to occupational therapy evaluation: interviewing, screening, assessment, and documentation. Overview of the characteristics of instruments and interpretation of data. Basic evaluation skills in occupational therapy across the lifespan are introduced. Graded on A/F basis only.

**OC\_THR 7420. Lifespan Occupations I. 2 Credits.**

Overview of typical development from infancy through adolescence from an occupational perspective. Emphasis on the impact of personal and contextual factors on occupational development in children and adolescents. Prerequisite: Admission to Occupational Therapy professional program and satisfactory completion of all previous professional program coursework (B or better for graduate students). Graded on A/F basis only.

**OC\_THR 7422. Fieldwork I - Children. 1 Credit.**

Development of clinical observation skills via on-site observation of children with typical and atypical development. Opportunities to gather and organize data, plan and implement activities, and develop therapeutic relationships with children and their care providers. Prerequisites: Admission to Occupational Therapy professional program and satisfactory completion of all previous professional program

coursework (C or better for undergrad; B or better for graduates). Graded on S/U basis only.

**OC\_THR 7450. Pediatric Practice. 4 Credits.**

Lecture and laboratory course designed which addresses OT pediatric frames of reference and theories. Common conditions seen in OT practice as well as interventions such as feeding, positioning, facilitation of movement and sensory strategies are also addressed. Admission to the OT professional program required. Graduate standing required. Graded on A-F basis only.

**OC\_THR 7510. Professional Perspectives. 4 Credits.**

The course will provide an understanding of personal and professional communication through experiential activities and team learning. The focus will be on the formation of professional and therapeutic relationships and development of leadership skills. Admission to the OT Professional Program required. Graduate standing required. Graded on A-F basis only.

**OC\_THR 7520. Fundamentals of Occupational Therapy. 4 Credits.**

This course will provide an overview of disability across the lifespan, including personal and professional interactions. Professional values, ethics and advocacy are also emphasized. Restricted to students who are currently enrolled in to the Occupational Therapy program. Graded on A-F basis only.

**OC\_THR 7590. Disability In Context. 2 Credits.**

Community experiences are provided for observation, interview, assessment, and relational skills with persons experiencing disabilities throughout the lifespan. Professional and therapeutic relationships encompassing holism are discussed. Seminar weekly. Graded on A/F basis only. Graduate standing required.

**OC\_THR 7620. Lifespan Occupations II. 2 Credits.**

Overview of biopsychosocial development and the aging process from young adulthood through older adulthood from an occupational perspective. Emphasis on the impact of client and contextual factors on occupational development and loss of occupations throughout the adult lifespan. Graded on A/F basis only. Prerequisite: Admission to the Occupational Therapy professional program and satisfactory completion of all previous professional program coursework (C or better for undergraduate; B or better for graduate).

**OC\_THR 7622. Fieldwork I Older Adults. 1 Credit.**

Development of evaluation and intervention skills via on-site interaction with older adults in a residential facility. Opportunities to gather data, plan/implement activities, document client performance, and develop therapeutic relationships with older adults and care providers. Graded on S/U basis only. Prerequisite: Admission to the Occupational Therapy professional program and satisfactory completion of all previous professional program coursework (C or better for undergraduate; B or better for graduate).

**OC\_THR 7650. Lifespan Interventions. 4 Credits.**

This course provides a foundational overview of common treatment theories and frames of reference that guide intervention planning across the lifespan. Prerequisite: Occupational Therapy [OC\_THR] 4310/7310 and 4520/7520. Graded on A/F basis only. Restricted to students who are currently enrolled in the Occupational Therapy Program.

**OC\_THR 7670. Hand and Upper Extremity Intervention. 2 Credits.**

To gain entry level skills needed to evaluate and treat common upper extremity conditions, including acute injuries and cumulative trauma disorders. Graded on A-F basis only. Prerequisite: OC\_THR 4222/

OC\_THR 7222, OC\_THR 4220/ OC\_THR 7220, OC\_THR 4390 / OC\_THR 7390.

**OC\_THR 7740. Neurophysiology II - Seminar: Advanced Concepts in Neuroscience. 1 Credit.**

This advanced seminar involves a review of neuro-based literature with a focus on translating neuroscience concepts and research findings into occupational therapy. Restricted to Occupational Therapy students only. Graded on S/U basis only.

**OC\_THR 7750. Cognition Across the Lifespan. 2 Credits.**

This course introduces students to theoretical models, assessment, and treatment in cognitive rehabilitation. Graded on A/F basis only. Prerequisite: restricted to Occupational Therapy Majors.

**OC\_THR 7770. Community-Based Practice. 3 Credits.**

Focus on role of occupational therapy in prevention, health and wellness. Program development and evaluation completed through community needs assessment and completion of health promotion project. Prerequisite: Admission to the OT Professional Program. Graded on A-F only basis.

**OC\_THR 7920. Fieldwork I Application of Clinical Skills. 2 Credits.**

Application of clinical reasoning. Integration of theory into clinical practice. Emphasis on treatment planning and implementation, outcome based intervention and professional communication. Includes lecture, seminar, and field experience. Graded on S/U basis only.

**OC\_THR 7921. Clinical Documentation. 2 Credits.**

Development of observation and assessment skills related to effective documentation of occupational therapy services. Emphasizes exposure to various clinical settings, third party payers, and legislative policies impacting documentation. Prerequisite: Admission to the professional program. Graded on A/F basis only. Graduate standing required.

**OC\_THR 7960. Readings in Occupational Therapy. 1-99 Credit.**

Directed readings and critical evaluation of the literature and research in occupational therapy. Repeatable upon consent of department. May be offered on A/F or S/U basis. Prerequisite: graduate standing required.

**OC\_THR 7970. Research Methods. 3 Credits.**

This course will use writing to explore basic concepts in research design and analysis. Restricted to Occupational Therapy Majors. Graduate standing required. Graded on A/F basis only.

**OC\_THR 7983. Fieldwork Level II-A. 3-9 Credit.**

Advanced practicum in various community settings such as the school system, hospitals, rehabilitation centers and residential facilities. Emphasis on hands-on experiences and translation of theory into practice. Graded on S/U basis only.

**OC\_THR 7993. Fieldwork Level II-B. 3-9 Credit.**

Advanced practicum in rehabilitation and various community settings for application of more specialized practice in community based settings. Emphasis on critical analysis of human occupation, clinical reasoning, synthesis, and evidence based practice. Graded on S/U basis only.

**OC\_THR 8002. Leadership, Management and Policy. 2-3 Credit.**

Management perspectives and organizational structure of occupational therapy services programs and the profession. Includes inter- and intra departmental relationships, management and supervision, standards, regulations, and ethical guidelines are emphasized.

**OC\_THR 8003. Mental Health Practice. 4 Credits.**

This graduate course will examine the practice of occupational therapy in treating emotional and mental illnesses and related psychosocial

dysfunction in the context of a variety of mental health treatment settings. The course will cover advanced frames of reference, treatment strategies, assessments, service delivery, program planning and group facilitation. In conjunction with didactic content students will actively explore these areas through hands on and practical learning experiences such as planning and leading groups, selecting and administering assessments, and developing a service delivery plan. The student will be required to complete an assigned field experience and write a reflection paper to insight and new perspectives on mental illness.

**OC\_THR 8004. School Based Practice. 1-2 Credit.**

Seminar and field experience intended to assist the occupational therapy student develop clinical skills in pediatric practice via class participation an on-site experience with children with special needs. The students will have opportunities to gather/organize date; develop therapeutic relationships with children with special needs and the educational team; and assist practicing professionals with various assessment, treatment, and documentation activities in pediatric occupational therapy practice. During the course the student will be assigned to integrated classroom in public schools that are servicing children with special needs and their families.

**OC\_THR 8005. Advanced Strategies. 3 Credits.**

Assessment and intervention strategies in specialty areas of occupation therapy from an adult perspective, including hand therapy, assistive technology, and advanced neurerehabilitation techniques. Includes client observation, assessment and treatment in clinical situations.

**OC\_THR 8087. Problem-Based Cases. 4 Credits.**

Synthesizes occupational therapy approaches to clinical scenarios across the lifespan and practice domains. Integrates clinical reasoning, patient values and evidence-based decision making into the occupational therapy process. Problem-based methodology emphasizes small group learning, problem solving, self/peer evaluation, and self-directed learning.

**OC\_THR 8090. Synthesis Project. 2 Credits.**

Write up scholarly manuscript for publication based on research conducted with research mentor. Emphasis on writing: introduction, literature review, analysis and interpretation of findings, and implication for field. Presentation and dissemination of acquired information through poster session and manuscript. Graded on A-F basis only.

**OC\_THR 8095. Synthesis Project - Mentor Hours. 1 Credit.**

Hours spent working with research mentor. Emphasis on data collection and analysis to complete synthesis project. Must be taken in conjunction with Synthesis Project course. Co-Requisite: Occupational Therapy [OC\_THR] 8090. Graduate standing required. Graded on S/U basis only.

**OC\_THR 8999. Occupational Therapy Clinical Practice. 1 Credit.**

This course provides to provide students with opportunities to participate in adult or pediatric clinical Occupational Therapy practice. Students will be assigned a client who is seeking Occupational Therapy services. With supervision students will provide evaluation, and develop treatment goals. Graded on S/U basis only. Prerequisites: OC\_THR 4390, OC\_THR 7390 and OC\_THR 4650, OC\_THR 7650. Restricted to students who are currently enrolled into the Occupational Therapy Program.

## Ophthalmology (OPHTH)

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**OPHTH 6321. ABS Age-Related Mechanism of Degeneration. 5-10 Credit.**

ABS Age-Related Mechanism of Degeneration.

**OPHTH 6323. ABS Ophthalmology Research. 5-10 Credit.**

ABS Ophthalmology Research.

**OPHTH 6325. ABS Ophthalmology Research and Review. 5 Credits.**

ABS Ophthalmology Research and Review.

**OPHTH 6585. Ophthalmology. 5 Credits.**

Ophthalmology.

## Parks, Recreation, and Tourism (P\_R\_TR)

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**P\_R\_TR 1010. Introduction to Leisure Studies. 3 Credits.**

History of recreation and leisure movement; theories and philosophies of play, recreation and leisure. Developmental stages of leisure services to contemporary status.

**P\_R\_TR 1011. Academic Planning and Career Orientation in Parks, Recreation and Tourism. 1 Credit.**

Orientation to the field and analysis of career opportunities in leisure services. Academic planning leading to B.S. in parks, recreation and tourism. Prerequisite: Parks, Recreation and Tourism [P\_R\_TR] major. Must be taken in first semester as a major. Graded on S/U basis only.

**P\_R\_TR 1080. Introduction to Sport Management. 3 Credits.**

This course will examine the meaning of sport management in terms of its history, scope, principles, issues and future trends. In addition, this course examines the job responsibilities and competencies required of sport managers in a variety of sport organizations. Graded A-F only.

**P\_R\_TR 1081. Sport Facility Design. 1 Credit.**

This course will investigate the functions of management in terms of design, implementation, operating and financing public assembly facilities in order to help sell the sport product. Venues such as public and private arenas, coliseums and stadiums will be studied. Restricted to Parks, Recreation, and Tourism majors with Sport Management emphasis or instructor consent. Graded on A-F basis only.

**P\_R\_TR 1084. Recreational Shooting Sports. 1 Credit.**

This course provides introductory instruction and hands-on shooting with an introduction to shooting range management. Instructor's consent required. Graded A-F only.

**P\_R\_TR 1085. The Sports Page. 1 Credit.**

This course is offered to introduce students to Sport Management by discussing the variety of sports, issues, perspectives and people that make the daily sport page worth reading. Prerequisites: Parks, Recreation and Tourism [P\_R\_TR] 1080. Instructor consent required is P\_R\_TR 1080 if co-requisite. Graded A-F only.

**P\_R\_TR 1091. Research and Descriptive Statistics for Parks, Recreation and Tourism. 3 Credits.**

An introduction to research methods and techniques and descriptive statistics and their application in the field of recreation and park administration. Math Reasoning Proficiency Course.

**P\_R\_TR 2082. Domestic and International Sports Environment. 1 Credit.**

This course will provide an overview of organization and management of domestic and international sport, including the Olympic movement and examination of the globalization of U.S. profession sports. Restricted to Parks, Recreation, and Tourism majors with Sport Management emphasis or instructor consent. Graded on A/F basis only.

**P\_R\_TR 2083. Technological Advancement in Sport. 1 Credit.**

This course will teach students how to solve sports technology problems they will face in their future career, plus develop computer aided design and manufacturing skills. They will also gain skills in team work, communication and presentation, IT, research and project management. Restricted to Parks, Recreation, and Tourism majors with Sport Management emphasis or instructor consent. Graded on A/F basis only.

**P\_R\_TR 2101. Topics in Park, Recreation and Tourism. 1-3 Credit.**

Specialized topic content in parks, recreation and tourism programs, management and/or development. Subject content and credit may vary by semester based on faculty resources and student needs. Offered periodically.

**P\_R\_TR 2103. Topics in Park, Recreation and Tourism - Behavioral Science. 1-3 Credit.**

Specialized topic content in parks, recreation and tourism programs, management and/or development. Subject content and credit may vary by semester based on faculty resources and student needs. Offered periodically.

**P\_R\_TR 2104. Topics in Park, Recreation and Tourism - Social Science. 1-3 Credit.**

Specialized topic content in parks, recreation and tourism programs, management and/or development. Subject content and credit may vary by semester based on faculty resources and student needs. Offered periodically.

**P\_R\_TR 2107. Aquatics Science. 3 Credits.**

A scientific perspective on water chemistry, preventive maintenance of aquatic facilities with an emphasis on the newest safety and engineering design information and construction techniques.

**P\_R\_TR 2111. Introduction to Planning and Evaluating Leisure Environments. 3 Credits.**

Presentation of basic planning principles. Evaluation of existing areas and facilities based upon planning guidelines. Consideration of park plans, standards, terminology, map preparation and evaluation.

**P\_R\_TR 2115. Consortium Field Experience. 1-3 Credit.**

An organized undergraduate experiential learning opportunity. Prerequisite: instructor's consent.

**P\_R\_TR 2140. Camp Leadership and Management. 3 Credits.**

Organization and administration of camps; program planning; selection and training of staff; camp site selection and development; health and safety; camp history, standards, trends; practical application of camp craft skills. Prerequisite: instructor's consent.

**P\_R\_TR 2142. Leadership of Social Recreation. 2 Credits.**

Study and practice in techniques of leading social activities suitable for various social settings. Offered periodically.

**P\_R\_TR 2143. Organization and Conduct of Recreation Centers. 2 Credits.**

Problems of operation, management of playgrounds, recreation centers.

**P\_R\_TR 2182. Ethics and Current Issues in Sports. 1 Credit.**

Ethical strategies of sport management will be emphasized in all management decisions and current issues that today's sport business professional faces will be studied. Prerequisites: instructor's consent. Graded on A/F basis only.

**P\_R\_TR 2206. Introduction to Leisure Service Management. 3 Credits.**

An introduction to public recreation in local government. Prerequisites: Parks, Recreation And Tourism [P\_R\_TR] 1010, 1011, 2111 or instructor's consent.

**P\_R\_TR 2281. The Business of Sport. 3 Credits.**

This course focuses on the business side of sport management, considering issues of marketing, sponsorship, and sales. Students will also be presented with actual models relevant to working in sales in the competitive sport environment. Restricted to Parks, Recreation, and Tourism majors with Sport Management emphasis or instructor consent. Graded on A/F basis only.

**P\_R\_TR 2750. Methods in Research and Evaluation. 3 Credits.**

An overview of social research methods, including terms, human and scientific inquiry, ethical behavior, literature review, sampling questionnaire construction, types of data collection, statistical analysis, and reporting of results. May be restricted to Parks, Recreation and Tourism Majors. Graded on A/F basis only.

**P\_R\_TR 3185. Sports Economics and Finance. 3 Credits.**

This course focuses on the economic and financial issues within the sport industry. The class will help students understand basic and complex concepts within economics and finance in a sport context, and to grasp the importance of financial and economic decision making. Restricted to Parks, Recreation, and Tourism majors with Sport Management emphasis or instructor consent. Graded on A/F basis only.

**P\_R\_TR 3189. Pre-Internship Seminar in Parks, Recreation and Tourism. 1 Credit.**

The course is designed to prepare students for 4940 Parks, Recreation and Tourism Internship. Emphasis is placed on students' responsibilities prior to enrollment in Parks, Recreation and Tourism [P\_R\_TR] 4940, selecting internship sites and completing internship requirements.

**P\_R\_TR 3210. Personnel Management and Leadership in Leisure Services. 3 Credits.**

Considers theories and practices of leadership and management in leisure services employment. Topic presentation in relationships, attitudes, supervision, motivation and group functioning. Prerequisite: restricted to Parks, Recreation and Tourism majors.

**P\_R\_TR 3215. Program Development in Leisure Services. 3 Credits.**

Fundamental principles and techniques of program development; seasonal, year round, specialty areas and total agency program planning. Prerequisites: Parks, Recreation And Tourism [P\_R\_TR] 1010, 1011, or instructor's consent; restricted to Parks, Recreation and Tourism majors.

**P\_R\_TR 3220. Introduction to Recreation for Individuals with Disabilities. 2 Credits.**

Principles, concepts and historical development of recreation for individuals with disabilities. Explanation of attitudes, issues, practice and barriers related to recreation participation. Prerequisite: restricted to Parks, Recreation and Tourism Students.

**P\_R\_TR 3227. Introduction to Therapeutic Recreation. 3 Credits.**

An investigation of therapeutic recreation service delivery models of the Parks, Recreation and Tourism [P\_R\_TR] 2111 and disabled in both institutional and community settings. Particular emphasis will be placed on advanced leadership and therapeutic interactional skills and dynamics.



**P\_R\_TR 3230. Introduction to Parks and Outdoor Recreation Services. 3 Credits.**

An overview of parks and outdoor recreation, natural environment, supply-demand-need relationships, interpretative programming, management philosophies/practices will be studied.

**P\_R\_TR 3231. Principles of Interpretive Outdoor Recreation. 3 Credits.**

Interpretive principles and techniques employed to communicate values, natural history and cultural features to the recreation user.

**P\_R\_TR 3282. Governance and Policy in Sport and Leisure. 3 Credits.**

This course serves as a comprehensive study in examining how leisure organizations address fundamental issues of governance and policy. Through careful use of policy and understanding of governance, organizations often form strategies in their attempts to gain an advantage. Restricted to Parks, Recreation, and Tourism majors with Sport Management emphasis or instructor consent. Graded A-F only.

**P\_R\_TR 4208. Administration of Leisure Services. 3 Credits.**

Theoretical foundations of the organization and administration of leisure services in both community and institutional settings. Emphasis on the roles of the administrator. Prerequisite: Restricted to Parks, Recreation and Tourism majors.

**P\_R\_TR 4312. Planning Recreation and Leisure Environments. 3 Credits.**

Practical application of basic planning principles and design. Layout and design of various leisure-oriented areas and facilities. Site planning and analysis.

**P\_R\_TR 4315. Senior Seminar in Leisure Services. 3 Credits.**

Presentation of professional principles and issues in leisure services. Seminar study resulting in presentations and discussions. Prerequisites: Parks, Recreation and Tourism [P\_R\_TR] majors, professional core or instructor's consent.

**P\_R\_TR 4327. Operation of Therapeutic Recreation: Procedures and Principles. 3 Credits.**

Theories and principles of leadership and programming as they apply to recreation services for the ill, handicapped, and aged.

**P\_R\_TR 4328. Leisure and Aging. 3 Credits.**

Basic understanding of problems/needs of later maturity in relation to recreation. Characteristics/capabilities of aged, program settings, financial support, planning guidelines emphasized. Objectives: provide fundamentals for recreation planning with aged individuals/groups. Offered periodically.

**P\_R\_TR 4329. Therapeutic Recreation Education/Counseling Techniques. 3 Credits.**

Techniques and models of leisure facilitation for use within a variety of clinical, residential and Institutional models. Theories of positive/negative leisure engagement reviewed.

**P\_R\_TR 4330. Therapeutic Recreation Assessment/Evaluation Procedures. 3 Credits.**

Reviews accepted clinical protocols for determining a client's physical, emotional, social and cognitive levels of functioning. Competencies in administering, scoring and interpreting multiple tools included.

**P\_R\_TR 4331. Administration of Outdoor Recreation - Education Programs. 3 Credits.**

Philosophies, essential principles, methods, techniques, resources, administrative and program practices for outdoor recreation and education. Offered periodically.

**P\_R\_TR 4333. Park Management. 3 Credits.**

Basic principles, practices and problems involved in managing public park systems. Consideration given to local, district, county, state, federal and foreign park systems. Prerequisite: Restricted to Parks, Recreation and Tourism majors.

**P\_R\_TR 4340. Advanced Recreation Land Management. 3 Credits.**

Advanced study of problems facing forest recreation managers. Topics include rivers recreation, wilderness management and citizen participation in decision making. Offered periodically.

**P\_R\_TR 4350. Problems in Parks, Recreation and Tourism. 1-3 Credit.**

Prerequisite: departmental consent.

**P\_R\_TR 4355. Private and Commercial Recreation Principles and Practice. 3 Credits.**

Considers principles, practices, influences in public/ private leisure services; influence of tourism/travel on public/private recreation services.

**P\_R\_TR 4356. Tourism Management. 3 Credits.**

Introduction to the scope and scale of the tourism industry. Focus on the industry components, concepts, structures, relationships, and issues with regard to accommodation, transportation, travel, regional development, political system, and the economic, social and environmental effects of tourism.

**P\_R\_TR 4357. Tourism Planning and Development. 3 Credits.**

Nature and scope of tourism planning at the local, regional, and national levels; economic social, environmental, and policy considerations. Comparative study of initiating, planning and implementing tourism and the organization of community resources for developing and controlling a tourism industry. Prerequisite: Parks, Recreation And Tourism [P\_R\_TR] 4356.

**P\_R\_TR 4385. Legal Aspects of Sport. 3 Credits.**

This course studies the U. S. legal system, its structure and terminology. Legal aspects of contract law, statutory law, constitutional law, intellectual property, torts, negligence, and risk management in sport will be examined. Restricted to Parks, Recreation, and Tourism majors with Sports Management emphasis or instructor consent. Graded on A/F basis only.

**P\_R\_TR 4940. Parks, Recreation and Tourism Internship. 12 Credits.**

Supervised professional experience with an approved organization. Course entails weekly reports, case studies, agency evaluations and a special project related to the student's curricular emphasis. Prerequisite: Parks, Recreation And Tourism [P\_R\_TR] 3189, [P\_R\_TR] majors only, instructor's consent.

**P\_R\_TR 4949. Western Canada Study Abroad. 3 Credits.**

This course provides students an educational opportunity to explore Western Canada. Students analyze natural resource management, customer and visitor relations, community relations, cultural entrepreneurship, and transportation networks with US and Canadian Management methods. Prerequisite: instructor's consent.

**P\_R\_TR 4950. Independent Research in Parks, Recreation and Tourism. 1-3 Credit.**

Independent research project in parks, recreation and tourism.  
Prerequisite: instructor's consent. Graded on A/F basis only.

**P\_R\_TR 7208. Administration of Leisure Services. 3 Credits.**

Theoretical foundations of the organization and administration of leisure services in both community and institutional settings. Emphasis on the roles of the administrator.

**P\_R\_TR 7312. Planning Recreation and Leisure Environments. 3 Credits.**

Practical application of basic planning principles and design. Layout and design of various leisure-oriented areas and facilities. Site planning and analysis.

**P\_R\_TR 7328. Leisure and Aging. 3 Credits.**

Basic understanding of problems/needs of later maturity in relation to recreation. Characteristics/capabilities of aged, program settings, financial support, planning guidelines emphasized. Objectives: provide fundamentals for recreation planning with aged individuals/groups. Offered periodically. Prerequisite: graduate standing.

**P\_R\_TR 7331. Administration of Outdoor Recreation - Education Programs. 3 Credits.**

Philosophies, essential principles, methods, techniques, resources, administrative and program practices for outdoor recreation and education. Offered periodically.

**P\_R\_TR 7333. Park Management. 3 Credits.**

Basic principles, practices and problems involved in managing public park systems. Consideration given to local, district, county, state, federal and foreign park systems.

**P\_R\_TR 7340. Advanced Recreation Land Management. 3 Credits.**

Advanced study of problems facing forest recreation managers. Topics include rivers recreation, wilderness management and citizen participation in decision making. Offered periodically.

**P\_R\_TR 7355. Private and Commercial Recreation Principles and Practice. 3 Credits.**

Considers principles, practices, influences in public/ private leisure services; influence of tourism/travel on public/private recreation services.

**P\_R\_TR 7356. Tourism Management. 3 Credits.**

Introduction to the scope and scale of the tourism industry. Focus on the industry components, concepts, structures, relationships, and issues with regard to accommodation, transportation, travel, regional development, political system, and the economic, social and environmental effects of tourism.

**P\_R\_TR 7357. Tourism Planning and Development. 3 Credits.**

Nature and scope of tourism planning at the local, regional, and national levels; economic social, environmental, and policy considerations. Comparative study of initiating, planning and implementing tourism and the organization of community resources for developing and controlling a tourism industry. Prerequisite: Parks, Recreation and Tourism [P\_R\_TR] 7356.

**P\_R\_TR 7960. Guided Reading in Parks, Recreation and Tourism. 1-3 Credit.**

Selected reading in parks, recreation and tourism identified to fulfill a graduate student's academic needs or specialized interests.  
Prerequisites: instructor's consent.

**P\_R\_TR 8085. Problems in Parks, Recreation and Tourism. 1-6 Credit.**

Independent research on special projects. Prerequisites: instructor's consent.

**P\_R\_TR 8087. Masters Level Graduate Seminar in Parks, Recreation and Tourism. 2 Credits.**

In this course, students and faculty will discuss and critically analyze contemporary issues on social concerns relating to leisure services. Graded on S/U basis only.

**P\_R\_TR 8089. Research Project. 1-99 Credit.**

Individual research on approved project. Involves creativity and scholarly inquiry where product does not adhere to the traditional thesis format. Prerequisite: Parks, Recreation and Tourism [P\_R\_TR] graduate major. Graded on S/U basis only.

**P\_R\_TR 8090. Thesis Research in Parks, Recreation and Tourism. 1-6 Credit.**

Research leading to thesis in field of parks, recreation and tourism. Prerequisite: Parks, Recreation and Tourism [P\_R\_TR] graduate major. Graded on S/U basis only.

**P\_R\_TR 8400. Constructs of Leisure. 3 Credits.**

Review analysis and implications of fundamental psycho-social determinants of leisure behavior. Application theories of determinants to existing and proposed leisure service systems.

**P\_R\_TR 8401. Topics in Recreation and Park Administration. 1-3 Credit.**

Specialized topics in recreation and park administration dynamics. Subjects and credits vary by semester based on available faculty resources and expertise. Course content announced in advance. Prerequisite: instructor's consent.

**P\_R\_TR 8411. Independent Work in Parks, Recreation and Tourism. 1-3 Credit.**

Independent research or special projects in parks, recreation and tourism. Prerequisites: instructor's consent.

**P\_R\_TR 8420. Leisure, Technology and Human Values. 3 Credits.**

Study of the developmental patterns of leisure services in society with emphasis to the dynamics of technology and leisure on individual and social values.

**P\_R\_TR 8427. Contemporary Issues in Therapeutic Recreation. 3 Credits.**

The course will include new issues and ideas in the field of therapeutic recreation, such as registration, insurance, liability, licensure, assessment, etc., and how they relate to practitioners and services to clients.

**P\_R\_TR 8430. Research Methods in Parks, Recreation and Tourism. 3 Credits.**

Analysis of basic research methodology. Review and analysis of research work completed in recreation, park and leisure field.

**P\_R\_TR 8436. Visitor Behavior and Policy. 3 Credits.**

Course presents issues, concerns and policies dealing with multi-management/planning/operations of outdoor resource based recreation. Such issues as energy, economics, social/ political, pollution and user characteristics will be studied.

**P\_R\_TR 8440. Philosophical Perspectives of Leisure. 3 Credits.**

Study of the theoretical and philosophical perspective of leisure in society with emphasis on integration and development of the student's personal and professional viewpoint.

**P\_R\_TR 8450. Administration in Leisure Service Delivery. 3 Credits.**

Review, analysis and synthesis of administrative functions as related to public and private recreation and leisure service enterprises.

**P\_R\_TR 8460. Financial Operations in Leisure Service Delivery. 3 Credits.**

Review and critical analysis of financial functions, strategies and methodology as related to public and private recreation and leisure service enterprises.

**P\_R\_TR 8940. Internship in Parks, Recreation and Tourism. 1-6 Credit.**

Supervised student practice in recreation, park or related settings under qualified instructor. Prerequisites: Parks, Recreation and Tourism [P R TR] graduate major.

## **Pathology & Anatomical Science (PTH\_AS)**

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**PTH\_AS 2000. Basic Pathology. 2 Credits.**

Provides nonmedical students with a general understanding of the essential nature of disease, including mechanisms of its development and cause/effect relationships. Prerequisites: 5 hours Biological Science or equivalent and 5 hours Chemistry or Pathology and Anatomical Science [PTH\_AS] 2201.

**PTH\_AS 2201. Human Anatomy Lecture. 3 Credits.**

Basic microscopic and gross human anatomy for Nursing, and Health Profession students. Prerequisite: Minimum cumulative MU GPA of 2.5 required.

**PTH\_AS 2203. Human Anatomy Laboratory. 2 Credits.**

Laboratory. Study of human microscopic and gross anatomical materials. Minimum cumulative MU GPA of 2.5 and concurrent registration or passing grade (C) in Pathology and Anatomical Science [PTH\_AS] 2201 required.

**PTH\_AS 2600. Cytology Female Genital Tract. 10 Credits.**

A definitive study of normal and abnormal cellular changes occurring within the organ system by means of light microscopy with histologic correlation. Prerequisite: instructor's consent.

**PTH\_AS 2610. Respiratory Cytology. 4 Credits.**

A definitive study of the normal and abnormal cellular changes occurring within the system by means of light microscopy, with histologic correlation. Prerequisite: instructor's consent.

**PTH\_AS 2615. Cytology of Body Fluids. 4 Credits.**

Normal and abnormal cellular changes within pleural, peritoneal, pericardial and cerebrospinal fluids by means of light microscopy, with histologic correlation. Prerequisite: instructor's consent.

**PTH\_AS 2620. Gastrointestinal Cytology. 4 Credits.**

A definitive study of the normal and abnormal cellular changes occurring within the system by means of light microscopy, with histologic correlation. Prerequisite: instructor's consent.

**PTH\_AS 2625. Oral Cytology. 2 Credits.**

Studies normal and abnormal cellular changes within the oral cavity and oropharynx by means of light microscopy, with histologic correlation. Prerequisite: instructor's consent.

**PTH\_AS 2630. Urinary Cytology. 4 Credits.**

Studies normal and abnormal cellular morphology from kidney, ureter and bladder samples, with histologic correlation. Prerequisite: instructor's consent.

**PTH\_AS 2685. Special Problems in Cytology. 2 Credits.**

Relating hematologic morphologic findings in conventional body fluid cytology; also review of techniques used in chromosome cultures and karyotyping, with emphasis on sex-related abnormalities.

**PTH\_AS 3400. Fundamentals of Medical Technology I. 3 Credits.**

Emphasizes diseases and basic laboratory methods used in clinical laboratory areas: microbiology, hematology, immunology, virology, tissue typing, blood banking and chemistry.

**PTH\_AS 3410. Fundamentals of Medical Technology II. 3 Credits.**

Continuation of Pathology and Anatomical Sciences [PTH\_AS] 3400.

**PTH\_AS 3415. Fundamentals of Medical Technology III. 3 Credits.**

Continuation of Pathology and Anatomical Sciences [PTH\_AS] 3400 and 3410.

**PTH\_AS 3420. Clinical Practicum. 3 Credits.**

Presentation and application of concepts and laboratory method used in areas of immunochemistry, toxicology, mycology, uranalysis and cytogenetics.

**PTH\_AS 3425. Hemostasis. 2 Credits.**

Lectures and laboratory exercises in basic theory and techniques of hemostasis including platelet function and disorders, plasma coagulation system, acquired and inherited themostatic disorders. Prerequisites: Pathology & Anatomical Science [PTH\_AS] 3400, 3410, 3415.

**PTH\_AS 3430. Clinical Immunology. 3 Credits.**

Antigen-antibody reactions and their role in determining infectious, auto-allergic and inflammatory disease states.

**PTH\_AS 3435. Blood Banking. 3 Credits.**

Principles and techniques of transfusion practices related through lectures and experience in the blood bank laboratory.

**PTH\_AS 3440. Clinical Hematology. 6 Credits.**

Lectures and laboratory regarding procedures for diagnosing hematologic disorders. Experience in collection of specimens from patients; staining, counting and identifying blood and bone marrow cells.

**PTH\_AS 3445. Clinical Microbiology. 6 Credits.**

Diagnostic procedures related to the isolation and identification to infectious microorganisms; bacteria and parasites. Emphasis on human pathogens and their sensitivity patterns with commonly used antibiotics.

**PTH\_AS 3450. Clinical Chemistry. 6 Credits.**

Principles of quantitative analysis applied to the measurement of substances in biological fluids. Significance of these findings in the diagnosis and treatment of disease.

**PTH\_AS 3455. Principles of Management and Education. 1 Credit.**

Lectures and discussion of management techniques and theories used in supervising laboratory personnel. Analysis of educational objectives and exam questions.

**PTH\_AS 3460. Research and Instructional Techniques. 3 Credits.**

Involves library and laboratory research. Includes development of oral and written communications skills.

**PTH\_AS 3485. Problems in Medical Technology. 1-3 Credit.**

Individual supervised work in a area of interest in medical technology. Prerequisite: instructor's consent.

**PTH\_AS 3500. Cytology of the Female Genital Tract. 8 Credits.**

A definitive study by means of light microscopy of normal and abnormal cellular changes occurring within the female genital tract along with histologic correlation. Prerequisite: senior standing and instructor's consent.

**PTH\_AS 3510. Cytology of Respiratory Tract. 4 Credits.**

A definitive study by means of light microscopy of normal and abnormal cellular changes occurring with the respiratory tract along with immunohistologic correlation. Prerequisite: senior standing and instructor's consent.

**PTH\_AS 3515. Cytology of Urinary Tract. 4 Credits.**

A definitive study by means of light microscopy of normal and abnormal cellular changes occurring within the urinary tract along with histologic correlation. Prerequisites: senior standing and instructor's consent.

**PTH\_AS 3520. Cytology of Gastrointestinal Tract. 5 Credits.**

A definitive study by means of light microscopy of normal and abnormal cellular changes occurring within the gastrointestinal tract along with histologic correlation. Prerequisites: senior standing and instructor's consent.

**PTH\_AS 3525. Cytology of Body Fluids. 4 Credits.**

A definitive study of light microscopy of normal and abnormal cellular changes occurring within body fluid along with histologic correlation. Prerequisites: senior standing and instructor's consent.

**PTH\_AS 3530. Cytology of Breast. 2 Credits.**

A definitive study by means of light microscopy of normal and abnormal cellular changes occurring within the breast with histologic correlation. Prerequisite: senior standing and instructor's consent.

**PTH\_AS 3535. Fine Needle Aspiration Cytology. 2 Credits.**

A definitive study by means of light microscopy of normal and abnormal cellular changes occurring within the fine needle aspirations from various body sites along with histologic correlation. Prerequisites: senior standing and instructor's consent.

**PTH\_AS 3540. Special Procedures in Cytology. 2 Credits.**

Study of hematologic findings in body fluid cytology: chromosome cultures and karyotyping. Emphasizing sex-related abnormalities; hormonal evaluation of smears from the female genital tract and their clinical significance. Prerequisites: senior standing and instructor's consent.

**PTH\_AS 3545. Clinical Management. 1 Credit.**

Procedures and processes helpful in operating in cytology laboratory, especially at the supervisory level. Prerequisites: senior standing and instructor's consent.

**PTH\_AS 3550. Technical Application with Research in Cytotechnology. 2 Credits.**

Research is an area of interest in cytology resulting in a written and oral presentation. Prerequisite: senior standing and instructor's consent.

**PTH\_AS 3555. Cytologic Preparation. 2 Credits.**

Independent applications of techniques used to prepare cytologic material. Prerequisite: senior standing and instructor's consent.

**PTH\_AS 3560. Practical Cytotechnology. 6 Credits.**

Independent application of techniques used to examine cytology material an manage a cytology laboratory. Prerequisite: senior standing and instructor's consent.

**PTH\_AS 3585. Problems in Cytotechnology. 1-3 Credit.**

Individual supervised work in an area of interest in cytology. Prerequisite: instructor's consent.

**PTH\_AS 3600. Elementary Histology. 3 Credits.**

Simplified gross and microscopic anatomy of normal organs and tissues commonly found in the routine histopathology laboratory.

**PTH\_AS 3610. Basic Histotechnology. 6 Credits.**

Theories and technical application of procedures used in the preparation of tissue sections and slides of microscopic examination; including instrumentation, fixation, dehydration, clearing infiltration, embedding, microtomy, H&E staining and coverslipping.

**PTH\_AS 3615. Special Staining Techniques. 6 Credits.**

Principles and procedures for special staining techniques for carbohydrates, connective tissues, blood, fat and lipids, pigments and minerals, bacteria and fungi, nerve, and other special cell stains.

**PTH\_AS 3620. Applied Histotechnology. 9 Credits.**

Application of basic histological techniques in the preparation of histologic sections and slides in a clinical setting.

**PTH\_AS 3625. Research and Instructional Techniques. 3 Credits.**

Involves library and laboratory search. Includes development of oral and written communications skills. Prerequisite: senior students admitted to Histotechnology Curriculum.

**PTH\_AS 3630. Clinical Management. 2 Credits.**

Supervisory techniques and procedures helpful in operating a histopathology laboratory: including laboratory safety, workload recording, and personnel management in a laboratory situation.

**PTH\_AS 3635. Basic Disease Processes. 2 Credits.**

Special readings and discussions of basic disease processes of interest to the anatomic pathology laboratory.

**PTH\_AS 3680. Advances Histotechnology. 6 Credits.**

Advanced and specialized techniques used in the preparation and processing of muscle, nerve and rectal biopsies; special techniques in cytology; electron microscopy; enzyme and immunohistochemistry; plastic embedding and neuropathologic techniques.

**PTH\_AS 3685. Problems in Histotechnology. 1-3 Credit.**

Individual supervised work in a specialized area of histotechnology. Prerequisite: instructor's consent.

**PTH\_AS 4200. General Pathology. 5 Credits.**

Basic pathological mechanisms of human disease. Introductory principles of clinical laboratory measurements of altered organ system function studied. Prerequisites: Pathology and Anatomical Sciences [PTH\_AS] 7200, 7220, 7310; and instructor's consent.

**PTH\_AS 4205. General Pathology Laboratory. 3 Credits.**

Gross and microscopic applied study of basic pathological disease mechanisms. Laboratory assessment of these basic disease mechanisms. Prerequisites: Pathology and Anatomical Sciences [PTH\_AS] 7200, 7220, 7310; or the equivalents; and instructor's consent.

**PTH\_AS 4210. Seminar in Pathology and Anatomical Sciences. 1 Credit.**

Presentation and discussion of original investigations and current literature.

**PTH\_AS 4220. Forensic Pathology and Death Investigation. 2 Credits.**

Forensic Pathology and Death Investigation.

**PTH\_AS 4222. Gross Human Anatomy (The Health Professions). 7 Credits.**

Gross structure and neuroanatomy of the human body; dissection of extremities, back, head, neck abdomen and thorax. Prerequisites: instructor's consent.

**PTH\_AS 4250. Interpretations of Lab Procedures in Primary Health Care. 1 Credit.**

Discussion and analysis of selected laboratory test procedures used in office and clinic settings involved with primary health care. Prerequisites: graduate level Physiology course and departmental consent.

**PTH\_AS 6331. ABS Advanced Medical Neurosciences. 5-10 Credit.**

ABS Advanced Medical Neurosciences.

**PTH\_AS 6333. ABS Pathology/Anatomical Science Research. 5 Credits.**

ABS Pathology/Anatomical Science Research.

**PTH\_AS 6335. ABS Pathology/Anatomical Science Research and Review. 5 Credits.**

ABS Pathology/Anatomical Science Research and Review.

**PTH\_AS 6341. ABS Science Anatomical Science Teaching. 5 Credits.**

ABS Science Anatomical Science Teaching.

**PTH\_AS 6343. ABS Surgical Anatomy. 5 Credits.**

ABS Surgical Anatomy.

**PTH\_AS 6345. ABS Surgical Anatomy of the Head and Neck. 5 Credits.**

ABS Surgical Anatomy of the Head and Neck.

**PTH\_AS 6347. ABS Surgical Anatomy of the Back and Limbs. 5 Credits.**

ABS Surgical Anatomy of the Back and Limbs.

**PTH\_AS 6349. ABS Surgical Anatomy of the Pelvis and Perinium. 5-10 Credit.**

ABS Surgical Anatomy of the Pelvis and Perinium.

**PTH\_AS 6600. Anatomic Pathology. 5 Credits.**

Anatomic Pathology.

**PTH\_AS 6602. Clinical Pathology. 5 Credits.**

Clinical Pathology.

**PTH\_AS 6604. Forensic Pathology. 5 Credits.**

Forensic Pathology.

**PTH\_AS 6606. Anatomic/Clinical Pathology. 5 Credits.**

Anatomic/Clinical Pathology.

**PTH\_AS 6608. Anatomy Elective. 5 Credits.**

Anatomy Elective.

**PTH\_AS 7020. Forensic Pathology and Death Investigation. 2 Credits.**

Summary of Forensic Death Investigation from beginning to end. Will include some of the current laboratory techniques seen on "CSI" Team taught by experts in the fields including medical examiners, death investigators, forensic anthropologists, police CSI teams, lawyers and others. Prerequisite: Basic Biology. Graduate standing required.

**PTH\_AS 7220. Human Histology and Organology. 4 Credits.**

Detailed study of cytology, histology and microscopic anatomy. Prerequisites: 10 hours of Biological Sciences and instructor's consent.

**PTH\_AS 7222. Gross Human Anatomy (The Health Professions). 7 Credits.**

Gross/human structure through dissection. Prerequisites: Acceptance into Physical Therapy Programs or consent of instructor. Graded on A/F basis only.

**PTH\_AS 7230. Mammalian Reproduction. 3 Credits.**

Reproduction in mammals, with emphasis on the neuroendocrine control of the hormones involved in reproductive process: biosyntheses, biologic actions, role. Prerequisites: graduate standing in one of Animal, Biologic, Medical, or Veterinary Sciences, instructor's consent.

**PTH\_AS 7300. Advanced Pathology. 5 Credits.**

Demonstration and simulation study of gross, microscopic and clinical laboratory pathology of major human organ systems. Prerequisites: Pathology and Anatomical Science [PTH\_AS] 4200 and 4205 or equivalent and instructor's consent.

**PTH\_AS 7320. Autonomic Nervous System. 2 Credits.**

A comprehensive consideration of the autonomic nervous system in man, with emphasis on morphology. Prerequisites: Pathology and Anatomical Science [PTH\_AS] 2201, Comparative Anatomy or equivalent, and instructor's consent.

**PTH\_AS 7330. Hematopoietic Organs. 2 Credits.**

Morphological and functional relationships of the blood-forming organs. Prerequisites: Basic Histology and instructor's consent.

**PTH\_AS 7350. Advanced Pathology Laboratory. 3 Credits.**

Demonstration and simulation and character of work depend upon needs, qualifications, and of major human organ systems. Prerequisites: Pathology and Anatomical Science [PTH\_AS] 4200 and 4205 or equivalent and instructor's consent.

**PTH\_AS 7400. Seminars in Translational Medicine. 0-5 Credit.**

Students participate in regular seminars and discussion groups with other students interested in clinical and translational sciences. Students, working together with faculty in biomedical sciences and those working in clinical and translational fields, identify seminar topics. Learning objectives and written assignments are arranged on an individual basis. The course is open to all graduate level students and students enrolled in professional schools, for 0-5 credit hours, with instructor's approval. Graduate standing required. Graded on S/U basis only.

**PTH\_AS 8000. Comparative Pathology. 3 Credits.**

(same as Veterinary Pathobiology [V\_P BIO] 8430). Biochemical and morphologic lesions related to the mechanism of disease expression in plants and animals.

**PTH\_AS 8010. Current Issues in Anatomical Sciences. 1 Credit.**

Survey of the recent literature in integrative anatomy, including functional, evolutionary, developmental and translational anatomy, conducted through readings and discussion. Grade determined by participation and presentation of weekly readings. Prerequisites: graduate standing;

instructor's consent. May be repeated for a maximum of 10 hours.  
Graded on S/U basis only.

**PTH\_AS 8090. Advanced Pathology. 1-99 Credit.**

Open only to properly qualified graduate students, with counsel of faculty. Focus of MS-related research in evolutionary morphology, genomics, neuroscience, pathobiology or laboratory sciences. Graded on S/U basis only.

**PTH\_AS 8100. Fundamentals of Evolutionary Biology. 3 Credits.**

Principles of modern evolutionary biology. Topics include: phylogeny, paleobiology, developmental processes, genetic and phenotypic variation, form and function, speculation, macroevolution, and molecular mechanisms. Prerequisite: graduate standing; instructor's consent.

**PTH\_AS 8200. Human Developmental and Gross Anatomy. 10 Credits.**

General principles of systemic and developmental anatomy. Gross anatomy and dissection of back, upper and lower extremities, head and neck, thorax, abdomen and pelvis. Prerequisites: graduate standing and instructor's consent.

**PTH\_AS 8285. Problems in Pathology and Anatomical Sciences. 1-99 Credit.**

Regions or systems which may include developmental, microscopic, and gross anatomy. Prerequisite: instructor's consent.

**PTH\_AS 8290. Research in Pathology and Anatomical Sciences. 1-99 Credit.**

Open only with instructor's consent. Research unrelated to thesis work in evolutionary morphology, genomics, neuroscience, pathobiology or laboratory sciences.

**PTH\_AS 8310. Anatomy of the Human Nervous System. 3 Credits.**

A comprehensive consideration of the morphology of the nervous system, emphasizing correlation of structure and function. Prerequisites: Pathology and Anatomical Science [PTH\_AS] 2201, Comparative Anatomy or equivalent, and instructor's consent.

**PTH\_AS 8500. Seminar in Translational Neuroscience. 1-5 Credit.**

Students participate in seminars and discussion groups. Masters students identify seminar topics and present existing data with findings. PhD students identify seminar topics, conduct research and present findings. Learning objective and written assignments are arranged individually. May be repeated for credit. Graded on S/U basis only.

**PTH\_AS 9090. Research in Pathology and Anatomical Sciences. 1-99 Credit.**

Open only to properly qualified graduate students, with counsel of faculty. Focus of PhD-related research in evolutionary morphology, genomics, neuroscience or pathobiology. Graded on S/U basis only.

**PTH\_AS 9290. Research in Pathology and Anatomical Sciences. 1-99 Credit.**

Open only with instructor's consent. Courses with specialized lectures in various topics such as evolutionary morphology, genomics, neuroscience and pathobiology, depending on faculty expertise and student demand. Graded on S/U basis only.

## Peace Studies (PEA\_ST)

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**PEA\_ST 1001. Topics in Peace Studies. 3 Credits.**

Underclass topics. Subjects may vary from semester to semester. May be repeated to 6 hours maximum. Graded on A/F basis only.

**PEA\_ST 1003. Topics in Peace Studies - Behavioral Science. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent.

**PEA\_ST 1004. Topics in Peace Studies. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent.

**PEA\_ST 1005. Topics in Peace Studies - Humanities. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Graded on A/F basis only.

**PEA\_ST 1050. Introduction to Peace Studies. 3 Credits.**

Interdisciplinary overview including theories on the nature of aggression and war, case studies of contemporary conflicts, consideration of various peace proposals, conditions making war or peace likely. Prerequisites: English [ENGLSH] 1000, sophomore standing.

**PEA\_ST 1120. Population and Ecology. 3 Credits.**

(Same as Rural Sociology [RU\_SOC] and Sociology [SOCIOL] 1120). Changes in the structure and characteristics of population groups and their relationship to both human and non-human aspects of the biophysical environment.

**PEA\_ST 1150. The Amish Community. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 1150). Examines historical antecedents and contemporary culture and social structure of the Amish. Topics include cultural symbols, life ceremonies, the family, counter cultural pressures, stresses and social change. Prerequisites: Rural Sociology [RU\_SOC] 1000, Sociology [SOCIOL] 1000, or Anthropology [ANTHRO] 1000.

**PEA\_ST 1195. Service Learning in Peace Studies. 1 Credit.**

Students will perform significant and long term community service while exploring issues central to peace studies.

**PEA\_ST 1610. Russia in Modern Times. 3 Credits.**

(same as History [HIST] 1610). Survey of Russian History from 1801 to present.

**PEA\_ST 2000. Exploration in Social and Economic Justice. 3 Credits.**

(Same as Social Work [SOC\_WK] 2000). This course explores issues of fairness and equality in economic, political and social systems, and applies social justice principles to major social problems. Graded on A-F basis only. May be repeated for credit.

**PEA\_ST 2003. Topics in Peace Studies: Behavioral Science. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisite: Sophomore standing or instructors consent. Graded on A/F basis only.

**PEA\_ST 2004. Topics in Peace Studies - Social Sciences. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisite: sophomore standing or instructor's consent.

**PEA\_ST 2005. Topics in Peace Studies - Humanities. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisite: sophomore standing or instructor's consent. Graded on A/F basis only.

**PEA\_ST 2100. The Vietnam and Iraq Wars: Lessons for the Future. 3 Credits.**

An interdisciplinary analysis of the Vietnam War and the American-led war with Iraq. Course focuses on the reasons that American lost in Vietnam, the reasons it won in Iraq, and the lessons these conflicts provided for America's future. Graded on A/F basis only. Prerequisite: sophomore standing.

**PEA\_ST 2180. Undergraduate Seminar I in Peace Studies. 3 Credits.**

Conflict Resolution in Theory and Practice. Conflicts are studied in the light of the social and behavioral sciences. Prerequisites: Peace Studies [PEA\_ST] 1050 or instructor's consent.

**PEA\_ST 2181. Undergraduate Seminar II in Peace Studies. 3 Credits.**

Contemporary International Conflict: A readings and research seminar in which students will address such problems as global conflicts, the Arms Race and disarmament, global development. Prerequisites: Peace Studies [PEA\_ST] 1050 or instructor's consent.

**PEA\_ST 2182. Critical Dialogues: Nonviolence in Peace/Democracy Movements. 3 Credits.**

(same as Sociology [SOCIOLOGY] 2182). History and theory of movements for peace, justice, and democracy. Development of violent and nonviolent tactics and factions in movements; relationship to state authority. Cases such as Gandhi's Independence, American Civil Rights, Arab Spring, and Occupy movements. Prerequisites: Peace Studies [PEA\_ST] 1050 or instructor's consent.

**PEA\_ST 2183. Undergraduate Seminar IV in Peace Studies. 3 Credits.**

Images of War and Peace. Study of war and peace in philosophical and religious systems, film, poetry, art, fiction, and the media. Prerequisites: Peace Studies [PEA\_ST] 1050 or instructor's consent.

**PEA\_ST 2200. Nuclear Weapons: Environmental, Health and Social Effects. 3 Credits.**

(same as HLTH\_SCI 2200 and SOCIOLOGY 2281). Environmental consequences of the nuclear arms race, "regional" nuclear war, and weapons testing for human health, agriculture, and society. Examining "a world without nuclear weapons"; political dialogue on proliferation; Iran, North Korea, and nuclear weapons conventions. Graded on A-F basis only.

**PEA\_ST 2201. Topics in Peace Studies-General. 2-3 Credit.**

Organized study of selected topics in Peace Studies. Subjects and credit hours may vary from semester to semester. Prerequisite: sophomore standing.

**PEA\_ST 2220. America in the 1960's. 3 Credits.**

(same as History [HIST] 2220). Examines the political and cultural main currents of the 1960s. Emphasizes the challenges mounted by protest groups and the responses of America's political leadership to the ferment of the period. Prerequisite: sophomore standing.

**PEA\_ST 2280. Race, Democracy, and Violence in Cuba and Haiti. 3 Credits.**

(same as SOCIOLOGY 2280). A sociological approach to understand race/ethnicity, identity, citizenship, human rights, violence, and political and economic systems in the Caribbean. Comparisons of the culture, politics,

and historical trajectories of Cuba and Haiti using Post-Colonial and Feminist theories. Graded on A-F basis only.

**PEA\_ST 2284. Critical Dialogs: Global Environmental Policy Conflicts. 3 Credits.**

(same as Sociology [SOCIOLOGY] 2284). Climate change, water supplies, food, sustainability, industrialization, and chemical, oil, radioactive pollution. Activity of transnational corporations, social harm, and formulation of international policies. Analysis of alternatives using criteria of justice: distribution, recognition, participation, legality.

**PEA\_ST 2285. Large Corporations, Economic Crisis, Social Responsibility. 3 Credits.**

(same as SOCIOLOGY 2285). Institutional power of the corporate CEO; ethical regulatory restraint. Historical contexts of economic crisis. Theories of justice, alternative concepts of justice in popular culture. Politics of policy issues in prosecution and criminalization of corporate behavior. Graded on A-F basis only.

**PEA\_ST 2320. Spanish Literature in Translation. 3 Credits.**

(same as Spanish [SPAN] 2320). May not be included in area of concentration in Spanish. Subject, such as the literature of the Spanish Civil War, varies with instructor. Prerequisite: sophomore standing.

**PEA\_ST 2410. Philosophies of War and Peace. 3 Credits.**

(same as Philosophy [PHIL] 2410). Moral issues about the recourse to war by the nation and the individual's obligations to participate. The nature of peace, social and personal. Special attention to the Vietnam War and the nuclear age.

**PEA\_ST 2490. Introduction to Native Studies. 3 Credits.**

(Same as ENGLISH 2490) Introduction to the field of Native Studies. Topics include indigenous knowledge, culture change and continuity, history and misrepresentation, politics and political history, and global indigenous relationships. Graded on A-F basis only.

**PEA\_ST 2710. Politics and the Military. 3 Credits.**

(same as Political Science [POL\_SCI] 2710). Comparative study of post-cold war civil-military relations; military as an interest group, change agent, policy instrument and competitor of civilian politicians.

**PEA\_ST 3003. Topics in Peace Studies - Behavioral Science. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisite: sophomore standing or instructor's consent.

**PEA\_ST 3005. Topics in Peace Studies - Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisite: sophomore standing. Graded on A/F basis only.

**PEA\_ST 3005H. Topics in Peace Studies - Humanities - Honors. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Graded on A/F basis only. Prerequisite: sophomore standing. Honors eligibility required.

**PEA\_ST 3130. Foreigners and Dangerous Women in Greek and Latin Literature. 3 Credits.**

(same as Classical Humanities [CL\_HUM] 3000). The study of how Greek and Roman writers depicted and reacted to other races and cultures,

compared them with their own, and thereby revealed both their own values and prejudices.

**PEA\_ST 3140. Art of War and Peace. 2-3 Credit.**

Exploration of selected visual art pieces and consideration of humanistic concerns during times of war and peace from various perspectives including a peace studies perspective. Viewing and discussing art within varied selected historical and cultural contexts that generated the imagery. Includes visits to studios and galleries. May be repeated for credit.

**PEA\_ST 3230H. Terrorism and Conflict Resolution - Honors. 3 Credits.**

Religious, ethnic, ideological movements; state and international reactions. Case studies from South America, Europe, Africa, Asia. Identifying problems, possible resolution. Dramatized thru discussions, documentaries, role-playing; short term paper, exams.

**PEA\_ST 3280. Internship in Peace Studies. 1-3 Credit.**

Students work in a peace-related agency or institution for 1 to 3 credit hours. Repeatable for maximum of 6 hours. Prerequisite: departmental consent. S/U graded only.

**PEA\_ST 3350. Readings in Peace Studies. 1-3 Credit.**

Students may receive 1 to 3 credit hours for doing readings and research in a particular area of peace studies. At least one paper will be required. Repeatable for a maximum of 6 hours. Prerequisite: instructor's consent.

**PEA\_ST 3400. Politics of the Media. 3 Credits.**

(same as Sociology [SOCIO] 3400). We look at the history and viability of the public sphere in the United States and the integral role of the media to its vitality. We analyze the impact of current trends toward media concentration and debate related issues of bias, censorship, and social control.

**PEA\_ST 3401. Global Health. 3 Credits.**

(Same as Health Sciences [HLTH\_SCI] 3400). An introduction to public health in a global context, with an emphasis on understanding how disparities in socioeconomic status, differences in political and national health care systems and the work of international organizations impact health in communities around the world. Graded A-F basis only.

**PEA\_ST 3420. America's Environmental Experience. 3 Credits.**

(same as History [HIST] 3420). Team-taught analysis of American thought and action on physical environment during 19th-20th centuries. Relation between politics, economics, technological change, environmental quality; roles of science, law, regulatory agencies, grassroots action.

**PEA\_ST 3440. After the Fact: Holocaust in Contemporary History, Art & Literature. 3 Credits.**

(same as German [GERMAN] 3440). Explores responses to the Holocaust from numerous perspectives. Considers how the Holocaust is remembered, memorialized, and debated in a variety of national contexts. Touches on historical, philosophical, and aesthetic points of view. Prerequisites: sophomore standing or instructor's consent.

**PEA\_ST 3490. Native Writing and Representation. 3 Credits.**

(same as ENGLSH 3490). Survey of native writing and representation from the late eighteenth century to the present, encompassing a diverse range of tribes and forms. Material will be drawn from tribes inhabiting the North American continent, but global indigenous relationships will also be addressed. Graded on A-F basis only.

**PEA\_ST 3510. Think Glogal: Fundamentals of Globalization and Digital Technologies. 3 Credits.**

(same as GERMAN 3510 and JOURN 3510). This interdepartmental course serves as the introductory seminar for students pursuing the certificate of digital global studies. The course focuses on the impact of technological change and globalization on cultures around the world from various interdisciplinary perspectives.

**PEA\_ST 3520. Collective Behavior. 3 Credits.**

(Same as Sociology [SOCIO] 3520). Analysis of crowd behavior and related phenomena: rumors, disasters, fashions. Social responses to unclear, dangerous or unjust conditions. The dynamics of conflict, consensus and change.

**PEA\_ST 3521. Group Decision Making Processes. 3 Credits.**

(same as Communications [COMMUN] 3571). Procedures and techniques for interpersonal communication and decision making in small groups. Prerequisite: sophomore standing.

**PEA\_ST 3522. New Media, Conflict and Control. 3 Credits.**

(same as Sociology [SOCIO] 3522) This course will explore the increasing role of new media tools in conflict and surveillance. Examples from recent conflicts will illustrate how citizens and regimes use new media to communicate, report, mobilize, monitor, and/or control. Students will utilize new media as they research instances of democracy and control.

**PEA\_ST 3550. War and Democracy in Late 5th c. BCE Athens. 3 Credits.**

(same as Classical Humanities [CL\_HUM] 3550). War and Democracy in Late 5th c. B.C.E. Athens explores the discourse on war and peace in Athenian texts and art that survives from the last quarter of the 5th century B.C.E. This was a period of adamantine, unrelenting warfare: the Athenians were fighting the Spartans, Sparta's allies, unaligned cities and several of their own subject states. Prerequisite: any 2000 level CL\_HUM course.

**PEA\_ST 3600. Criminology. 3 Credits.**

(same as Sociology [SOCIO] 3600). Sociology of law; constitutional, psychological, sociological theories of criminal behavior; process of criminal justice; treatment of corrections; control of crime.

**PEA\_ST 3610. Ireland, 1100s to 1850. 3 Credits.**

(same as History [HIST] 3610). Ireland, from Conquest to Famine: Ireland's history as the first British Colony, from the conquests of the 1100s and 1500s-1600s to the Irish rebellion of 1798 and the Great Famine and mass emigration of 1845-50. Prerequisite: sophomore standing.

**PEA\_ST 3611. Ireland, 1850-1923. 3 Credits.**

(same as History [HIST] 3611). Ireland, from Famine to Partition: Irish history from the Great Famine of 1845-50 to the revolutions of 1916-23 that brought partial independence from Britain but partitioned Ireland into two hostile and trouble states.

**PEA\_ST 3612. Ireland, 1920-Present. 3 Credits.**

(same as History [HIST] 3612). Ireland, from Partition to the Present: After surveying the conflicts that led to Irish revolution and partition in 1916-23, the course focuses on the development of post partition Ireland and Northern Ireland, and on the violence that has scarred Northern Ireland since the 1960s. Prerequisites: History [HIST] 3610 and/or 3611 recommended.



**PEA\_ST 3780. World Political Geography. 3 Credits.**

(same as Geography [GEOG] 3780). Geographic factors in the development of political boundaries traditions, and societal perspectives. Spatial patterns and geopolitical processes are explored in selected regions of the world. Prerequisites: Geography [GEOG] 1100 or 1200 or sophomore standing.

**PEA\_ST 3810. Imperial China. 3 Credits.**

(same as History [HIST] 3810). A survey of China under the Manchu Ch'ing dynasty. Within framework of the dynastic cycle, examines imperial rule, Chinese society, culture, art, internal rebellion, Western intrusion and modernization.

**PEA\_ST 3840. Nonviolence in the Modern World. 3 Credits.**

(same as History [HIST] 3840 and South Asia Studies [S A ST] 3245). Readings on recent world history, emphasis on Gandhi and nonviolent tradition in America Europe and the Third World. Prerequisite: sophomore standing.

**PEA\_ST 3870. Social Revolution in Latin America. 3 Credits.**

(same as History [HIST] and Sociology [SOCIO] 3870). Twentieth century social revolutions in selected Latin American countries.

**PEA\_ST 4003. Topics in Peace Studies - Behavioral Sciences. 3 Credits.**

Upperclass Topics. Subject may vary from semester to semester. Prerequisite: junior standing required.

**PEA\_ST 4005. Topics in Peace Studies: Humanities. 2-6 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated to a maximum of 6 hours with departmental consent. Prerequisite: sophomore standing or instructor's consent. Graded on A-F basis only.

**PEA\_ST 4080. American Foreign Policy from Colonial Times to 1898. 3 Credits.**

(same as History [HIST] 4080).

**PEA\_ST 4230. Women, Development and Globalization. 3 Credits.**

(same as Sociology [SOCIO] 4230 and Women's and Gender Studies [WGST] 4230 and Black Studies [BL\_STU] 4230). Examines the history and structure of "development" discourse and practices. Stresses the interconnections and impact on women globally. Reviews women's strategies in defining and instituting programs to improve quality of life in communities. Prerequisites: BL\_STU 1332, 2200; SOCIO 2200, WGST 1332 or 2010.

**PEA\_ST 4240. Theory and Practice of Theatre of the Oppressed. 3 Credits.**

(same as Theatre [THEATR] 4240). Theory and practice of Augusto Boal's liberatory interactive theatre process, including application of techniques of specific social issues. Prerequisite: instructor's consent.

**PEA\_ST 4260. The Age of Ascendancy: U.S. Foreign Relations, 1945-Present. 3 Credits.**

(same as History [HIST] 4260). Surveys the Cold War in Europe and Asia, the Korean and Vietnam Wars, and Middle East policy. Prerequisite: sophomore standing.

**PEA\_ST 4330. Science and Technology of Terrorism and Counterterrorism. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 4330). Terrorism has been a familiar tool of political conflict, and it has assumed greater importance during the past twenty years. This subject has been treated by political scientists in various forms, but the scientific and technological aspects of different forms of terrorism cannot be found in a single place. It is

important for persons who propose counter measures to understand the basics of different types of terrorism such as for instance the nature of chemical agents, their properties such as toxicity, etc. in order to build better defense systems. Prerequisite: instructor's consent.

**PEA\_ST 4331. Nonproliferation Issues for Weapons of Mass Destruction. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 4331). Nonproliferation impact on technology and world events. Prerequisite: junior or senior standing required or instructor's consent.

**PEA\_ST 4341. Building Communities from the Grassroots. 3 Credits.**

(Same as Rural Sociology [RU\_SOC] 4341). Introduction and application of basic community development concepts, methods and practical skills for involving and empowering local citizens and leaders effectively in community-based efforts regardless of the issue. Instructor's consent required.

**PEA\_ST 4360. Economic Development. 3 Credits.**

(same as Economics [ECONOM] 4360). The study of less-developed countries including problems of measuring economic growth, analysis of sources of economic growth, causes of changes in economic and social structure, development and trade policies. The consequences of goals and assumptions for development policy are analyzed. Prerequisites: ECONOM 3229 and 3251 or 4351.

**PEA\_ST 4410. Politics and War. 3 Credits.**

(same as Political Science [POL\_SC] 4410). Why do wars occur? The function of force and uses of a threat of force. Problems of national security strategy and arms control. Prerequisite: junior standing required.

**PEA\_ST 4440. Ethical Issues in Communication. 3 Credits.**

(same as Communication [COMMUN] 4440). Exploration and analysis of ethical dimensions intrinsic to human communication. Prerequisite: junior standing or departmental consent.

**PEA\_ST 4480. War Crimes and Genocide. 3 Credits.**

(same as History [HIST] 4480). This course will explore the development of international law, international consciousness, and U.S. Foreign policy on the two distinct but often related issues of war crimes and genocide during the late 19th and throughout the 20th centuries.

**PEA\_ST 4510. Western Europe's Foreign Policy. 3 Credits.**

Comparison of foreign policies of the major Western European countries; their roles within the European community. Study of institutions and functioning of the European community and its potential as an emerging world power. Prerequisite: junior standing.

**PEA\_ST 4520. Political Sociology. 3 Credits.**

(same as Sociology [SOCIO] 4520). Social bases of power and politics, economic and political elites, the political economy of the advanced societies, sources of political conflict and change. MA core course. Prerequisite: Sociology [SOCIO] 3200, 3510, 3520, or 3700.

**PEA\_ST 4550. Gender and Human Rights in Cross Cultural Perspective. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4550 and Sociology [SOCIO] 4550). This course focuses on the global discourse on human rights and gender, emphasizing cross-cultural theories. Course includes the meaning of rights, Western and nonwestern perspectives, feminist contributions, important substantive debates, violations, policymaking and activism. Prerequisites: WGST 1120 or SOCIO 2200; senior standing required.

**PEA\_ST 4600. Political and Social Philosophy. 3 Credits.**

(same as Philosophy [PHIL] 4600). Contemporary and/or historical theories of justice and the state. Utilitarianism, liberalism, libertarianism, Marxism, Communitarianism and feminism may be among the views covered. Prerequisite: sophomore standing and two courses in Philosophy; or instructor's consent.

**PEA\_ST 4830. Journalism and Conflict. 3 Credits.**

(same as Journalism [JOURN] 4730). Introduction to the basic principles of conflict theory and negotiation, including the sources of conflict, why conflict escalates and what the conditions are for de-escalation, all with a special emphasis on the implications for the working journalist.

**PEA\_ST 4940. Leadership and Ethics. 3 Credits.**

(same as Naval Sciences [NAVY] 4940). The curriculum provides a foundation in leadership, ethical decision making, the Law of Armed Conflict and the military justice system. Course explores ethical theories and helps students to build an ethical framework for decision making. Topic areas include: Kant, Utilitarianism, Stoicism, Constitutional Paradigm, Uniform Code of Military Justice and Law of Armed Conflict. Designed as a capstone course for juniors and seniors enrolled in NROTC it is open to all MU students. Prerequisite: junior standing.

**PEA\_ST 4970. Senior Thesis I. 3 Credits.**

Senior essay on a Peace Studies topic requiring major research. Prerequisite: Peace Studies [PEA\_ST] 1050, senior standing, and instructor's consent.

**PEA\_ST 4980. Peace Studies Abroad - Social Sciences. 3-6 Credit.**

A study abroad experience organized by MU and led by MU faculty. Provides students with interdisciplinary study in foreign cultures, career development, and global experience with issues such as war, domestic conflict, sustainable development, human rights, and nonviolent movements for peace and justice. May be repeated for credit.

**PEA\_ST 7003. Topics in Peace Studies - Behavioral Sciences. 3 Credits.**

Upperclass Topics. Subject may vary from semester to semester. Prerequisite: graduate standing.

**PEA\_ST 7080. American Foreign Policy from Colonial Times to 1898. 3 Credits.**

(same as History [HIST] 7080). Prerequisite: graduate standing.

**PEA\_ST 7240. Theory and Practice of Theatre of the Oppressed. 3 Credits.**

(same as Theatre [THEATR] 7240). Theory and practice of Augusto Boal's liberatory interactive theatre process, including application of techniques of specific social issues. Prerequisite: instructor's consent.

**PEA\_ST 7260. The Age of Ascendancy: U.S. Foreign Relations, 1945-Present. 3 Credits.**

(same as History [HIST] 7260). Surveys the Cold War in Europe and Asia, the Korean and Vietnam Wars, and Middle East policy. Prerequisite: graduate standing.

**PEA\_ST 7520. Political Sociology. 3 Credits.**

(same as Sociology [SOCIO] 7520). Social bases of power and politics, economic and political elites, the political economy of the advanced societies, sources of political conflict and change. MA core course. Prerequisite: graduate standing and SOCIOL 3200, 3510, 3520, or 3700.

**PEA\_ST 7550. Gender and Human Rights in Cross Cultural Perspective. 3 Credits.**

(same as Sociology [SOCIO] / Women and Gender Studies [WGST] 7550). Focuses on the global discourse on human rights and gender,

emphasizing cross-cultural theories. Course includes the meaning of human rights, western and nonwestern perspectives, feminist contributions, important substantive debates, violations, policymaking and activism. Prerequisites: graduate standing.

**PEA\_ST 7640. Ethical Issues in Communication. 3 Credits.**

(same as Communication [COMMUN] 7640). Exploration and analysis of ethical dimensions intrinsic to human communication. Prerequisite: graduate standing or departmental consent.

**PEA\_ST 7980. Peace Studies Abroad. 3-6 Credit.**

A study abroad experience organized by MU and led by MU faculty. Provides students with interdisciplinary study in foreign cultures, career development, and global experience with issues such as war, domestic conflict, sustainable development, human rights, and nonviolent movements for peace and justice. May be repeated for credit.

## Personal and Financial Planning (FINPLN)

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**FINPLN 1183. Financial Survival. 1 Credit.**

Examines financial management issues needed to survive the critical college years-credit/credit cards, budgeting/planning, financial aid, loans, common financial mistakes, debt management, setting financial goals, effective use of financial resources. Graded on S/U basis only.

**FINPLN 2083. Financial Planning Careers. 1 Credit.**

This course will provide the student with a broad, general introduction to careers in financial planning. Through readings, introspection, discussions, and guest speakers, the student will develop an understanding of the field.

**FINPLN 2183. Personal and Family Finance. 3 Credits.**

Individual and family finance, with particular emphasis on financial planning, savings, insurance, investments, taxes, use of credit, and financial aspects of housing. Prerequisites: Mathematics [MATH] 1100/1120 with grade of C or above, and sophomore or above standing. Math Reasoning Proficiency Course.

**FINPLN 2185. Consumer as Entrepreneur. 3 Credits.**

The American economic system and marketplace from both a consumer and an entrepreneurial perspective.

**FINPLN 3282. Financial Counseling. 3 Credits.**

Practical course on client financial counseling. Includes development of sales techniques and training, focus on personality strengths and weaknesses, creation of the sales process, and the role of technology in counseling. Prerequisite: Personal Financial Planning [FINPLN] 2183 or instructor's consent.

**FINPLN 3283. Financial Planning: Computer Applications. 3 Credits.**

Development of expertise in analyzing family financial case situations via applications of the mathematics of finance, utilizing computer spreadsheets and family financial management software. Prerequisites: Personal Financial Planning [FINPLN] 2183.

**FINPLN 3285. Financial Planning: Real Estate. 3 Credits.**

Family housing and real estate investments as components of the family's quality of life and asset portfolio. Prerequisites: Personal Financial Planning [FINPLN] 3283; 5-6 hours of Economics [ECONOM]; Statistics [STAT] 1300 or 2500.

**FINPLN 3287. Consumer and Household Economics I. 3 Credits.**

Theory, concepts, principles underlying consumer decision-making, including rationality, uncertainty, optimal search, heuristics, interactive decisions; strategies for their application in the marketplace. Prerequisites: 5-6 hours of Economics [ECONOM].

**FINPLN 4000. Problems in Personal Financial Planning. 1-99 Credit.**

Supervised and independent work. Prerequisites: a 2000- or 3000-level course in field of problem, and senior standing, and instructor's consent.

**FINPLN 4183. Sales Management. 3 Credits.**

Prepares students to enter financial service occupations dependent upon sales and sales management. Attention given to skill development, evaluation of current and best practices. Prerequisites: junior standing; acceptance into professional program; Personal Financial Planning [FINPLN] 2183 Pre- or co-requisite FINPLN 3283 or instructor's consent.

**FINPLN 4187. Tax Planning. 3 Credits.**

Principles, current law and practice of income taxation and its impact on personal financial planning for individuals, couples and families in their roles as investors, employees, and business owners. Graded on A/F basis only. Prerequisites: Personal Financial Planning [FINPLN] 2183, 3283; Accountancy [ACCTCY] 2010 or equivalent or instructor's consent. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4188. Community Agencies and Volunteerism. 3 Credits.**

Service learning in a non-profit community social support agency. Examines economic role of non-profits and volunteerism. Students engage in service and evaluate experience in seminar. Pre/corequisites: Personal Financial Planning [FINPLN] 3282, 4187/7187 or instructor's consent. Graded on A/F basis only. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4189. Financial Planning: Applied Tax Law. 3 Credits.**

This course trains students to become volunteer tax preparers and provides the opportunity to use their skills in a lab setting to prepare personal tax returns for U.S. citizens and resident aliens living in central Missouri. The course also discusses tax law, especially as it applies to clients of the Volunteer Income Tax Assistance site. Prerequisites: Personal Financial Planning [FINPLN] 4187 or instructor's consent.

**FINPLN 4318. Topics in Personal Financial Planning. 1-99 Credit.**

Selected current topics in field of interest. Prerequisites: vary with topic.

**FINPLN 4355. Recent Trends in Personal and Financial Planning. 1-3 Credit.**

For upper-class students who wish additional knowledge and understanding in specific subject matter areas. Prerequisites: vary with the topic.

**FINPLN 4380. Assessing the American Dream. 3 Credits.**

A systems perspective examining ways choice and culture shape American levels and standards of living. The impact of trends in personal and family values, technology, the economy, mass media and social movements on household resource management. Prerequisite: English [ENGLSH] 1000 and junior standing or instructor's consent.

**FINPLN 4382. Financial Planning: Risk Management. 3 Credits.**

Analysis of family financial risks and conservation of family assets via risk management, with primary focus on personal lines of insurance. Prerequisites: Personal Financial Planning [FINPLN] 3283; 5-6 hours of Economics [ECONOM]; Statistics [STAT] 1300 or 2500. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4383. Financial Planning: Investment Management. 3 Credits.**

Introduction to investment for family financial planning. Prerequisite: Personal Financial Planning [FINPLN] 3283; 5-6 hours of Economics [ECONOM]; Statistics [STAT] 1300 or 2500; ECONOM 3229 or instructor's consent. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4386. Financial Planning: Employee Benefits and Retirement Planning. 3 Credits.**

Fundamentals of employee benefits and retirement planning. Consideration of options via government, employer, financial markets. Special circumstances of women, part-time, and contingent workers considered. Prerequisites: Personal Financial Planning [FINPLN] 4382, 4383, or instructor's consent. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4387. Consumer and Household Economics II. 3 Credits.**

Theory of economic behavior examining the household as both consumer and producer of goods and services, human capital investments, intertemporal decisionmaking, and use of computative studies to examine price and income effects. Prerequisite: Personal Financial Planning [FINPLN] 3287 or Economics [ECONOM] 3251; Statistics [STAT] 1300 or 2500.

**FINPLN 4388. Effective Consumer Decision-Making. 3 Credits.**

Theory, concepts, principles underlying consumer decision-making, including rationality, uncertainty, optimal search, heuristics, interactive decisions; strategies for their application in the marketplace. Prerequisites: 5-6 hours of Economics [ECONOM].

**FINPLN 4389. Financial Planning: Case Analysis. 3 Credits.**

The course emphasizes the use of analytical tools to develop effective financial plans for individuals and households. Prerequisites: Personal Financial Planning [FINPLN] 4187, 4382, 4383 or instructor's consent. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4393. Financial Planning: Estate and Gift Planning. 3 Credits.**

Fundamentals, practical problems and solutions in basic estate and gift planning, business succession planning, and taxation issues. Prerequisites: Personal Financial Planning [FINPLN] 4382 and 4383 or instructor's consent. Not available to Pre-Personal Financial Planning majors.

**FINPLN 4418. Topics in Personal Financial Planning. 1-99 Credit.**

Selected current topics in field of interest. Prerequisites: instructor's consent.

**FINPLN 4483. Financial Success. 1 Credit.**

Examines financial management issues needed to survive the critical post-college years - managing educational debt; after-school budgeting; auto, health, and other forms of insurance; retirement planning and other investment issues; setting financial goals; effective use of financial resources. Graded on S/U basis only.

**FINPLN 4992. Readings in Personal Financial Planning. 1-99 Credit.**

Prerequisite: 2-3 hours in subject.

**FINPLN 4993. Internship in Personal Financial Planning. 1-99 Credit.**

Prerequisites: junior standing and instructor's consent.

**FINPLN 7000. Problems in Personal Financial Planning. 1-99 Credit.**

Prerequisites: 4000-level course in field of problem and instructor's consent.

**FINPLN 7001. Topics in Household Economics and Finance. 1-99 Credit.**

Selected current topics in field of interest. Prerequisites: graduate standing.

**FINPLN 7083. Teaching Personal Finance Literacy. 3 Credits.**

(same as Learning Teaching and Curriculum Vocational [LTC\_V] 7083) Principles and practices of teaching personal finance with particular emphasis on income, money management, spending and credit, and savings and investing. Prerequisites: Graduate standing. Course graded on A/F basis only.

**FINPLN 7085. Problems in Household Economics and Finance. 1-99 Credit.**

Supervised independent work related to household economics and finance. Prerequisite: graduate standing and instructor's consent.

**FINPLN 7087. Seminar in Household Economics and Finance. 1-4 Credit.**

Reports and discussion of recent research and practice in household economics and finance. Prerequisite: graduate standing.

**FINPLN 7183. Fundamentals of Personal Financial Planning. 3 Credits.**

Issues and concepts related to the financial planning process, including determination of financial goals and expectations and analysis and evaluation of personal and family financial data with emphasis on savings, insurance, investments, taxes, credit and financial aspects of housing. Prerequisite: graduate standing.

**FINPLN 7187. Financial Planning: Tax Planning. 3 Credits.**

Principles, current law and practice of income taxation and its impact on personal financial planning for individuals, couples and families in their roles as investors, employees, and business owners. Graded on A/F basis only. Prerequisites: graduate standing required. Personal Financial Planning [FLNPLN] 2183, FINPLN 3283, Accountancy [ACCTCY] 2010 or equivalent or instructor's consent.

**FINPLN 7282. Advanced Financial Counseling. 3 Credits.**

Students will learn client-centered financial counseling. Includes development of interviewing techniques, focus on personality strengths and weaknesses, creation of the sales process, and the role of technology in counseling. Graded on A/F basis only.

**FINPLN 7355. Recent Trends in Personal Financial Planning. 1-3 Credit.**

For upper-class and graduate students who wish additional knowledge and understanding in specific subject matter areas. Prerequisites: vary with the topic; graduate standing.

**FINPLN 7380. Assessing the American Dream. 3 Credits.**

A systems perspective examining ways choice and culture shape American levels and standards of living. The impact of trends in personal and family values, technology the economy, mass media and social movements on household resource management. Prerequisite: graduate standing.

**FINPLN 7382. Financial Planning: Risk Management. 3 Credits.**

Analysis of family financial risks and conservation of family assets via risk management, with primary focus on personal lines of insurance. Prerequisites: graduate standing and Personal Financial Planning [FINPLN] 3283; 5-6 hours of Economics; Statistics [STAT] 1300 or 2500.

**FINPLN 7383. Financial Planning: Investment Management. 3 Credits.**

Management of family financial investments. Prerequisites: graduate standing and Personal Financial Planning [FINPLN] 3283; 5-6 hours of Economics; Statistics [STAT] 1300 or 2500.

**FINPLN 7386. Financial Planning: Employee Benefits and Retirement Planning. 3 Credits.**

Fundamentals of employee benefits and retirement planning. Consideration of options via government, employer, financial markets. Special circumstances of women, part-time, and contingent workers considered. Prerequisites: graduate standing and Personal Financial Planning [FINPLN] 4382, 4383, or instructor's consent.

**FINPLN 7387. Consumer and Household Economics II. 3 Credits.**

Theory of economic behavior examining the household as both consumer and producer of goods and services, human capital investments, intertemporal decision-making, and use of computative studies to examine price and income effects. Prerequisite: graduate standing and Personal Financial Planning [FINPLN] 3287 or Economics [ECONOM] 3251; Statistics [STAT] 1300 or 2500.

**FINPLN 7388. Effective Consumer Decision-Making. 3 Credits.**

Theory, concepts, principles underlying consumer decision-making, including rationality, uncertainty, optimal search, heuristics, interactive decisions; strategies for their application in the marketplace. Prerequisites: graduate standing and Personal Financial Planning [FINPLN] 2185; 5-6 hours of Economics.

**FINPLN 7389. Financial Planning: Case Analysis. 3 Credits.**

The course emphasizes the use of analytical tools to develop effective financial plans for individuals and households. Prerequisites: Personal Financial Planning [FINPLN] 2183, 4183, 4382, 4383. Graduate Standing Required.

**FINPLN 7393. Financial Planning: Estate and Gift Planning. 3 Credits.**

Fundamentals, practical problems and solutions in basic estate and gift planning, business succession planning, and taxation issues. Prerequisites: graduate standing and Personal Financial Planning [FINPLN] 4382 and 4382.

**FINPLN 7412. Research Methods in Personal Financial Planning. 3 Credits.**

Introduction to the scope, purpose and methods of research in consumer and family economics, with emphasis on economic survey methods. Prerequisites: graduate standing, and an introductory statistics course.

**FINPLN 7583. Personal Financial Issues of Older Adults. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 7583). Principles and practice of personal finance relevant to assessing and improving the financial security of older individuals. Topics covered include sources of income, management of cash flow, credit use and abuse, risk exposure, investment management, housing, and financial planning. Financial vulnerabilities of seniors will be explored. Prerequisites: Bachelor or Master's degree in human services, social work, mental health, nursing physical rehabilitation or psychology; Must be enrolled in Graduate Certificate in Geriatric Care Management program. May be repeated for credit. Graded on A/F basis only.

**FINPLN 7960. Readings in Household Economics and Finance. 1-99 Credit.**

Readings in recent research in household economics and finance. Prerequisites: graduate standing and instructor's consent.

**FINPLN 7993. Internship in Personal Financial Planning. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**FINPLN 8001. Topics in Personal Financial Planning. 1-99 Credit.**

Selected current topics in field of interest. Prerequisite: graduate standing.

**FINPLN 8085. Problems in Household Economics and Finance. 1-99 Credit.**

Supervised independent work related to household economics and finance. Prerequisite: graduate standing and instructor's consent.

**FINPLN 8087. Seminar in Household Economics and Finance. 1-99 Credit.**

Report and discussion of recent research and practice in household economics and finance. Prerequisite: graduate standing and instructor's consent.

**FINPLN 8090. Master's Thesis Research in Personal Financial Planning. 1-99 Credit.**

Independent research leading to thesis or dissertation. Graded on S/U basis only. Prerequisite: graduate standing and instructor's consent.

**FINPLN 8183. Military Personal Financial Readiness. 3 Credits.**

Financial planning process applied to military personnel and their families. Focus on service member status; financial readiness; recordkeeping; management of cash flow, risk, credit and debt, savings, investments, tax, savings; education planning, retirement and estate planning. Graded on A/F basis only. Graduate Standing required.

**FINPLN 8187. Professional Practices in Financial Planning. 3 Credits.**

Practice management techniques for Financial Planners. Graded A/F only.

**FINPLN 8380. Family Systems. 3 Credits.**

Exploration of the family as a system within the broader context of society.

**FINPLN 8385. Housing and Real Estate. 3 Credits.**

The study of real estate as a component to household wealth. Graded on A/F basis only.

**FINPLN 8386. International Employee Benefits and Retirement Planning. 3 Credits.**

This course develops the theory and application of international employee benefits and retirement planning. Universal theory will be applied to analyze existing programs in an international context. Prerequisites: Personal Financial Planning [FINPLN] 7183 and 7383. Course graded on A/F basis only.

**FINPLN 8389. Financial Planning Case Studies. 3 Credits.**

The analysis and development of appropriate presentations for effective financial plans. Graduate standing required.

**FINPLN 8393. International Estate and Gift Planning. 3 Credits.**

This course develops the theory and application of end of life planning in an international context. Core estate planning education will prepare students to sit for the CFP exam, while addressing issues prevalent in other countries. Prerequisites: Personal Financial Planning [FINPLN] 7183, 7383. Graded on A/F basis only.

**FINPLN 8450. Applied Research in Household Economics and Planning. 1-99 Credit.**

Independent research not leading to a thesis. Report required. For students completing Master's in Personal Financial Planning. Prerequisite: graduate standing, and instructor's consent.

**FINPLN 8483. Family Economics. 3 Credits.**

Multi-disciplinary study of research on families as economic units. Examines trends in family income, wealth, labor market participation, household production, distribution of household resources, use of public goods, and underground economy. Prerequisites: graduate standing.

**FINPLN 8485. Human Resource Development and Allocation. 3 Credits.**

Economic analysis of conditions, programs and policies related to development and use of human resources, with special reference to impact on families and households. Prerequisites: graduate standing; Personal Financial Planning [FINPLN] 4387 or instructor's consent.

**FINPLN 8486. Social Policy and the Family Economy. 3 Credits.**

Economic analysis of public programs that directly affect well-being of families: income maintenance, goods transfers, employment, housing, health, transportation, taxes, etc.; consideration of underlying philosophies, policy alternatives. Prerequisites: graduate standing; Personal Financial Planning [FINPLN] 7387 or instructor's consent.

**FINPLN 8500. Personal Financial Planning Capstone. 1-99 Credit.**

Independent work on project approved by major advisor and CFP (R) Program Director. For students completing Master's in Personal Financial Planning. Prerequisite: graduate standing and instructor's consent. May be repeated for credit.

**FINPLN 8960. Readings in Household Economics and Finance. 1-99 Credit.**

Readings in recent research in household economics and finance. Prerequisites: graduate standing and instructor's consent.

**FINPLN 9001. Topics in Household Economics and Finance. 1-99 Credit.**

Selected current topics in field of interest. Prerequisites: graduate standing.

**FINPLN 9085. Problems in Household Economics and Finance. 1-99 Credit.**

Supervised independent work related to household economics and finance. Prerequisite: graduate standing and instructor's consent.

**FINPLN 9087. Seminar in Household Economics and Finance. 1-99 Credit.**

Report and discussion of recent research and practice in household economics and finance. Prerequisite: graduate standing and instructor's consent.

**FINPLN 9090. Doctoral Dissertation Research in Personal Financial Planning. 1-99 Credit.**

Independent research leading to thesis or dissertation. Graded on S/U basis only. Prerequisite: graduate standing and instructor's consent.

**FINPLN 9960. Readings in Household Economics and Finance. 1-99 Credit.**

Readings in recent research in household economics and finance. Prerequisites: graduate standing and instructor's consent.

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## Philosophy (PHIL)

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**PHIL 1000. General Introduction to Philosophy. 3 Credits.**

Introduction to traditional philosophical problems and methods of philosophical enquiry. Consideration given to different philosophical

theories on the nature of reality, man, nature and God; knowledge and how it is acquired; values and social issues.

**PHIL 1000H. General Introduction to Philosophy - Honors. 3 Credits.**

Introduction to traditional philosophical problems and methods of philosophical enquiry. Consideration given to different philosophical theories on the nature of reality, man, nature and God; knowledge and how it is acquired; values and social issues. Honors eligibility required.

**PHIL 1100. Introduction to Ethics. 3 Credits.**

Introduction to different philosophical theories regarding when acts are morally right rather than wrong; when things are good rather than bad; nature of the "good life", nature of ethical reasoning and justification.

**PHIL 1100H. Introduction to Ethics - Honors. 3 Credits.**

Introduction to different philosophical theories regarding when acts are morally right rather than wrong; when things are good rather than bad; nature of the "good life", nature of ethical reasoning and justification. Honors eligibility required.

**PHIL 1150. Introductory Bioethics. 3 Credits.**

This course approaches moral problems in biomedical and scientific research from a philosophical perspective. First, we'll familiarize ourselves with ethics and political philosophy. Then we'll study the ethical issues that arise in connection with a series of issues, including research involving human and animal subjects, eugenics, the human genome project, cloning and stem cell research. By thinking about these issues, we learn how to think critically about particular moral quandaries, as well as to uncover and examine some of our deepest moral commitments.

**PHIL 1200. Logic and Reasoning. 3 Credits.**

Methods of analyzing and evaluating arguments of all types. Uses both informal and formal techniques. Identifies informal fallacies and introduces elementary symbolic logic.

**PHIL 1200H. Logic and Reasoning-Honors. 3 Credits.**

Methods of analyzing and evaluating arguments of all types. Uses both informal and formal techniques. Identifies informal fallacies and introduces elementary symbolic logic. Honors eligibility required.

**PHIL 2000. Philosophical Ideas in Literature. 3 Credits.**

Philosophical ideas and issues revolving around human freedom as these ideas and issues are embodied in great literary works from Plato through Dostoyevski to Burgess. Prerequisite: sophomore standing.

**PHIL 2005. Topics in Philosophy-Humanities. 1-3 Credit.**

Organized study of philosophical issues to which no regular course is devoted. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing or instructor's consent.

**PHIL 2010. The Philosophy of Film. 3 Credits.**

(same as Film Studies [FILM\_S] 2010). Philosophical problems having to do with film. Topic may include the nature of films, the differences between fiction and documentary film, ethical issues with film and filmmaking.

**PHIL 2100. Philosophy: East and West. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 2100). Compares the interpretation and role of philosophical concepts such as experience, reason, permanence, change, immortality, soul, God, etc., in Indian, Chinese and European traditions. Prerequisite: sophomore standing.

**PHIL 2200. Philosophy and Intellectual Revolution. 3 Credits.**

Examines such revolutions as the Copernican, Darwinian, Marxian and Freudian. What are the new views? How is our place in the universe

affected? What puzzles arise in replacing old by new views? Prerequisite: sophomore standing.

**PHIL 2300. Philosophy and Human Nature. 3 Credits.**

Philosophical exploration and examination of theories of human nature with reference to relevant developments in such sciences as biology, psychology, and economics. Prerequisite: sophomore standing.

**PHIL 2350. The Meaning of Life. 3 Credits.**

Does life have meaning, or is it essentially meaningless, absurd? This course will examine some of answers philosophers have given to this and related questions.

**PHIL 2400. Ethics and the Professions. 3 Credits.**

Examination of ethical issues confronted by members of different professions such as medicine, law, business, journalism and engineering. Prerequisite: sophomore standing.

**PHIL 2410. Philosophies of War and Peace. 3 Credits.**

(same as Peace Studies [PEA\_ST] 2410). Moral issues about the recourse to war by the nation and the individual's obligations to participate. The nature of peace, social and personal. Special attention to the Vietnam War and the nuclear age. Prerequisite: sophomore standing.

**PHIL 2420. Ethical Issues in Business. 3 Credits.**

Major theories of moral obligation and justice and their application to business practices. Corporate responsibility, government regulation, investment and production, advertisement, the environment, preferential hiring, etc. through case studies, legal opinions and philosophical analysis. Prerequisite: sophomore standing.

**PHIL 2430. Contemporary Moral Issues. 3 Credits.**

Review of the major contemporary ethical theories and their contribution to the resolution of major social issues such as euthanasia, suicide, abortion, capital punishment, violence and war. Emphasis on nature, interests, and rights of persons. Graded on A/F basis only. Prerequisite: sophomore standing.

**PHIL 2440. Medical Ethics. 3 Credits.**

Considers moral issues posed by developments in biological sciences and medical technology. Topics may include: genetic engineering, abortion and euthanasia, distribution of health care.

**PHIL 2500. Philosophy and Gender. 3 Credits.**

(same as Women and Gender Studies [WGST] 2500). A critical examination of central ideas and themes in feminist philosophical thought. Topics may include: sex, marriage, parenthood, reproduction, body image, pornography, prostitution. Prerequisite: sophomore standing.

**PHIL 2600. Rational Decisions. 3 Credits.**

Principles for making decisions in a rational way. Special attention to principles that use probabilities and utilities. Some discussion of decisions made in conjunction with other people, and decisions made for other people. Prerequisites: sophomore standing and grade of C or better in Mathematics [MATH] 1100/1120. Math Reasoning Proficiency Course.

**PHIL 2700. Elementary Logic. 3 Credits.**

(same as Linguistics [LINGST] 2700). Introduces a symbolic language for representing the structure of arguments. Presents precise rules for demonstrating the validity of arguments. Covers natural deduction for sentence and predicate logic. Develops skill in constructing derivations. Prerequisites: sophomore standing and grade of C or better in Mathematics [MATH] 1100/1120. Math Reasoning Proficiency Course.

**PHIL 2820. Introduction to Cognitive Science. 3 Credits.**

(same as Psychology [PSYCH] 2820 and Linguistics [LINGST] 2820). Cognitive science is the interdisciplinary study of the mind. After an overview of the foundations of cognitive science as a whole, we will see what particular sectors of it have to say about mental capacities such as vision, language, categorization, and social cognition. Prerequisites: Psychology [PSYCH] 1000; sophomore standing.

**PHIL 3000. Ancient Western Philosophy. 3 Credits.**

Philosophical thought on nature, knowledge, the gods, human life and society, from Thales to Augustine. Emphasis on Plato and Aristotle. The relevance of the ancients to contemporary life. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 3100. Medieval Philosophy. 3 Credits.**

Major thinkers from St. Augustine through 14th century Ockhamists. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 3200. Modern Philosophy. 3 Credits.**

Surveys critical and speculative thinking of modern period from Descartes to Kant in relation to scientific, religious and social movements. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 3400. 19th Century Philosophy. 3 Credits.**

A careful and sympathetic study of some of the major thinkers of this period, notably Kierkegaard and Nietzsche. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 3500. Existentialism. 3 Credits.**

The nature of human existence, the meaning of life, the relation of the individual to nature, society, and any gods that may be, according to Kierkegaard, Nietzsche, Heidegger, Sartre, de Beauvoir, Camus and others. Students are encouraged to come to grips with the issues in relation to their own lives. Prerequisite: sophomore standing and one course in Philosophy, or instructor's consent.

**PHIL 3600. 20th Century Philosophy. 3 Credits.**

The course will be a survey of some of the notable philosophers/thinkers whose contributions have been made in the twentieth century. Prerequisite: sophomore standing and one course in Philosophy, or instructor's consent.

**PHIL 3700. Selected Modern Philosophers. 3 Credits.**

Advanced study of a particular philosopher or a number of philosophers from the same school in the modern period. May be taken twice for credit with permission of the department. Prerequisite: sophomore standing and one course in Philosophy, or instructor's consent.

**PHIL 3800. Selected Contemporary Philosophers. 3 Credits.**

Advanced study of a particular contemporary philosopher or philosophers. May be taken twice for credit with permission of the department. Prerequisite: sophomore standing and one course in Philosophy, or instructor's consent.

**PHIL 4001. Topics in Philosophy-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing and two courses in Philosophy, or instructor's consent; departmental consent for repetition.

**PHIL 4005. Topics in Philosophy-Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing and

two courses in Philosophy, or instructor's consent, departmental consent for repetition.

**PHIL 4100. Philosophy of Language. 3 Credits.**

(same as Linguistics [LINGST] 4100). Examination of contemporary views of the relationship between language, minds, and the world. Prerequisites: sophomore standing and Philosophy [PHIL] 2700 and one other course in Philosophy; or instructor's consent.

**PHIL 4110. Advanced Logic. 3 Credits.**

(same as Linguistics [LINGST] 4110). Presents the method of truth trees for sentence and predicate logic. Examines proofs concerning the decidability, soundness, and completeness of formal systems. Emphasizes the theory of formal systems. Prerequisites: sophomore standing and Philosophy [PHIL] 2700, or instructor's consent. Math Reasoning Proficiency Course.

**PHIL 4120. Selected Topics in Logic. 3 Credits.**

Elementary set theory. Modal logic, the logic of possibility and necessity. Prerequisites: sophomore standing and either Philosophy [PHIL] 2700 or 4110; or instructor's consent.

**PHIL 4130. Probability and Induction. 3 Credits.**

This course studies probability, its various interpretations, and its basic principles. It identifies forms of reasoning that establish the probability of a conclusion. The methods of reasoning it treats are at the heart of science and practical affairs. Prerequisite: sophomore standing and Philosophy [PHIL] 2700; or instructor's consent.

**PHIL 4200. Metaphysics. 3 Credits.**

Metaphysics studies what there is and how things are, most generally speaking. Topics may include realism versus nominalism, substance and attribute, facts, modality, identity and causality. Previous work in Philosophy [PHIL] 1000, 3000 or 3200 recommended. Prerequisite: sophomore standing and two Philosophy courses; or instructor's consent.

**PHIL 4210. Philosophy of Mind. 3 Credits.**

Considers theories and arguments in contemporary philosophy of mind, focusing on the nature of mental states, their relation to brain states and the plausibility of various materialist theories of the mind. Prerequisite: sophomore standing and two Philosophy courses; or instructor's consent.

**PHIL 4220. Philosophy of Religion. 3 Credits.**

Considers basis for and nature of religious beliefs. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 4300. Epistemology. 3 Credits.**

An examination of contemporary philosophical theories concerning the nature, sources and limits of knowledge and justified belief. Previous work in Philosophy [PHIL] 1000, 3000, 3200 is recommended. Prerequisite: sophomore standing and two courses in Philosophy, or instructor's consent.

**PHIL 4400. Philosophy of Science. 3 Credits.**

Why believe the scientific world-view? What, if anything, is the scientific method? Are today's theories really superior to past theories? Examines contemporary philosophical answers to such questions. Prerequisite: sophomore standing and two courses in Philosophy; or instructor's consent.

**PHIL 4410. Philosophy of History. 3 Credits.**

Readings from classic and contemporary philosophers of history. Problems about nature and limits of historical knowledge; relation between history and other disciplines; the existence, nature, and kinds

of historical laws. Prerequisite: sophomore standing and two courses in Philosophy; or instructor's consent.

**PHIL 4420. Philosophy of Biology. 3 Credits.**

A survey of philosophical problems arising from consideration of evolutionary theory and the biological sciences. Topics may include reductionism, sociobiology, biological laws, and epistemic problems relating to evolutionary theory. Prerequisite: sophomore standing and two courses in Philosophy; or instructor's consent.

**PHIL 4500. Theories of Ethics. 3 Credits.**

Normative and meta-ethical theories. Topics may include the rationality and objectivity of morality, the meaning of moral language, the differences between deontological, utilitarian and virtue theories. Prerequisite: sophomore standing and two courses in Philosophy; or instructor's consent.

**PHIL 4600. Political and Social Philosophy. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4600). Contemporary and/or historical theories of justice and the state. Utilitarianism, Liberalism, Libertarianism, Marxism, Communitarianism and Feminism may be among the views covered. Prerequisite: sophomore standing and two courses in Philosophy; or instructor's consent.

**PHIL 4610. Philosophy of Law. 3 Credits.**

What is law? Are there pre- or trans-legal rights? Is punishment justifiable? How can judicial decisions be justified? What are the relations between law and morality? Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 4620. Marxism. 3 Credits.**

A philosophical examination of (a) the notion of critique as seen in Marx's early and middle writings, and (b) specific topics by such authors as Lenin, Lukacs and Plekhanov. Prerequisite: Sophomore standing and two courses in Philosophy; or consent of department.

**PHIL 4700. Aesthetics. 3 Credits.**

Typical components of art; theories of art as representation, form, expression; relation of art to value. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 4800. Asian Philosophy. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 4800). This course traces the origins of Indian and Chinese philosophical world views. Included are the major ideas in Hindu, Jaina, and Buddhist thought in India, and Taoism and Confucianism in China. Emphasis is placed on the diverse, assimilative, and pragmatic nature of Indian thought and its impact on contemporary Asian philosophy. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 4810. Philosophy of India. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 4810). General development of Indian philosophy. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**PHIL 4850. Special Readings in Philosophy. 1-3 Credit.**

Prerequisite: junior standing.

**PHIL 4950. Senior Seminar in Philosophy. 3 Credits.**

A capstone course required of and only open to senior Philosophy majors. Course content will vary, depending on the professor teaching the course. Prerequisite: senior Philosophy major.

**PHIL 4998. Honors I in Philosophy. 3 Credits.**

Special work for Honors candidates. Prerequisite: junior standing.

**PHIL 4999. Honors II in Philosophy. 3 Credits.**

Special work for Honors candidates. Prerequisite: junior standing.

**PHIL 7001. Topics in Philosophy-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: graduate standing and instructor's consent, departmental consent for repetition.

**PHIL 7005. Topics in Philosophy-Humanities. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: graduate standing and instructor's consent, departmental consent for repetition.

**PHIL 7100. Philosophy of Language. 3 Credits.**

(same as Linguistics [LINGST] 7100). Examination of contemporary views of the relationship between language, minds, and the world. Prerequisite: graduate standing and Philosophy [PHIL] 2700 or instructor's consent. Some work in PHIL 1000, 3000 or 3200 recommended.

**PHIL 7110. Intermediate Logic. 3 Credits.**

(same as Linguistics [LINGST] 4110). Presents the method of truth trees for sentence and predicate logic. Examines proofs concerning the decidability, soundness, and completeness of formal systems. Emphasizes the theory of formal systems. Prerequisite: graduate standing and Philosophy [PHIL] 2700.

**PHIL 7120. Selected Topics in Logic. 3 Credits.**

Elementary set theory. Modal logic, the logic of possibility and necessity. Prerequisite: Philosophy [PHIL] 2700 or 7110.

**PHIL 7130. Probability and Induction. 3 Credits.**

This course studies probability, its various interpretations, and its basic principles. It identifies forms of reasoning that establish the probability of a conclusion. The methods of reasoning it treats are at the heart of science and practical affairs. Prerequisite: Philosophy [PHIL] 2700.

**PHIL 7200. Metaphysics. 3 Credits.**

Metaphysics studies what there is and how things are, most generally speaking. Topics may include realism versus nominalism, substance and attribute, facts, modality, identity and causality. Previous work in Philosophy [PHIL] 1000, 3000 or 3200 recommended. Prerequisite: graduate standing.

**PHIL 7210. Philosophy of Mind. 3 Credits.**

Considers theories and arguments in contemporary philosophy of mind, focusing on the nature of mental states, their relation to brain states and the plausibility of various materialist theories of the mind. Prerequisite: graduate standing.

**PHIL 7220. Philosophy of Religion. 3 Credits.**

Considers basis for and nature of religious beliefs. Philosophical approaches to religion, cultural implications of religion, psychoanalysis and religion, mysticism and myth. Prerequisite: graduate standing.

**PHIL 7300. Epistemology. 3 Credits.**

An examination of contemporary philosophical theories concerning the nature, sources and limits of knowledge and justified belief. Previous work in Philosophy [PHIL] 1000, 3000, or 3200 is recommended. Prerequisite: graduate standing.

**PHIL 7400. Philosophy of Science. 3 Credits.**

Why believe the scientific world-view? What, if anything, is the scientific method? Are today's theories really superior to the past theories? Examines contemporary philosophical answers to such questions. Prerequisite: graduate standing.



**PHIL 7410. Philosophy of History. 3 Credits.**

Readings from classic and contemporary philosophers of history. Problems about nature and limits of historical knowledge; relation between history and other disciplines; the existence, nature, and kinds of historical laws. Prerequisite: graduate standing.

**PHIL 7420. Philosophy of Biology. 3 Credits.**

A survey of philosophical problems arising from consideration of evolutionary theory and the biological sciences. Topics may include reductionism, sociobiology, biological laws, and epistemic problems relating to evolutionary theory. Prerequisites: graduate standing required.

**PHIL 7500. Theories of Ethics. 3 Credits.**

Normative and meta-ethical theories. Topics may include the rationality and objectivity of morality, the meaning of moral language, the differences between deontological, utilitarian and virtue theories. Prerequisite: graduate standing and one course in Philosophy.

**PHIL 7600. Political and Social Philosophy. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4600). Contemporary and/or historical theories of justice and the state. Utilitarianism, Liberalism, Libertarianism, Marxism, Communitarianism and Feminism may be among the views covered. Prerequisite: graduate standing.

**PHIL 7610. Philosophy of Law. 3 Credits.**

What is law? Are there pre- or trans-legal rights? Is punishment justifiable? How can judicial decisions be justified? What are the relations between law and morality? Prerequisite: graduate standing.

**PHIL 7620. Marxism. 3 Credits.**

A philosophical examination of (a) the notion of critique as seen in Marx's early and middle writings, and (b) specific topics by such authors as Lenin, Lukacs and Plekhanov. Prerequisite: graduate standing.

**PHIL 7700. Aesthetics. 3 Credits.**

Typical components of art; theories of art as representation, form, expression; relation of art to value. Prerequisite: graduate standing.

**PHIL 7800. Asian Philosophy. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 4800). This course traces the origins of Indian and Chinese philosophical world views. Included are the major ideas in Hindu, Jaina, and Buddhist thought in India, and Taoism and Confucianism in China. Emphasis is placed on the diverse, assimilative, and pragmatic nature of Indian thought and its impact on contemporary Asian philosophy. Prerequisite: graduate standing.

**PHIL 7810. Philosophy of India. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 4810). General development of Indian philosophy. Prerequisite: graduate standing.

**PHIL 7850. Special Readings in Philosophy. 1-3 Credit.**

Prerequisite: graduate standing.

**PHIL 8090. Research in Philosophy. 1-99 Credit.**

Research not leading to thesis. Prerequisite: graduate standing in Philosophy. Graded S/U only.

**PHIL 8100. Protoseminar in Philosophy. 3 Credits.**

Introduction to graduate level work in philosophy. Required of all students entering the program, in the first year. An intensive workshop focused on skills rather than any particular philosophical content. Prerequisite: restricted to first year graduate students.

**PHIL 8210. Teaching of Philosophy I. 1 Credit.**

Seminar meetings on course design, teaching methods, the evaluation of teaching, grading, instructor obligations, and teaching aids. Some individualized instruction, including help preparing for and assessing the

effectiveness of practice teaching. Prerequisite: graduate students in philosophy.

**PHIL 8220. Teaching of Philosophy II. 1 Credit.**

A sequel to Philosophy [PHIL] 8210. Includes a re-examination of end of semester tasks such as the composition and grading of finals and the assignment of course grades. Prerequisite: Philosophy [PHIL] 8210; graduate standing in philosophy.

**PHIL 8300. Dissertation Seminar. 1 Credit.**

The course will address writing and time management for Ph.D. students writing a dissertation. Also discussed will be preparation for the academic job market in philosophy, especially the development of an application dossier. Prerequisite: Philosophy Ph.D. student. Graded on S/U basis only.

**PHIL 8510. Metaphysics: A Survey. 3 Credits.**

A graduate-level survey of central issues in metaphysics. May be repeated up to 6 hours of credit. Prerequisites: graduate standing or instructor's consent.

**PHIL 8520. Philosophy of Mind: A Survey. 3 Credits.**

A graduate-level survey of central issues in the philosophy of mind. Graduate Standing Required or instructor's consent.

**PHIL 8530. Epistemology: A Survey. 3 Credits.**

A graduate-level survey of central issues in epistemology. Graduate Standing or instructor's consent required.

**PHIL 8540. Philosophy of Language: A Survey. 3 Credits.**

A graduate-level survey of central issues in philosophy of language. Graduate standing or consent of instructor required.

**PHIL 9001. Topics in Philosophy. 1-99 Credit.**

Organized study of selected topics. Need departmental consent for repetition. Prerequisites: Graduate standing and instructor's consent.

**PHIL 9040. Indian Philosophy. 3 Credits.**

Reality, levels of being, status of the world, nature of knowledge in Indian philosophy in relations in Advaita Vendanta system of Samkara. Prerequisite: graduate standing in Philosophy.

**PHIL 9050. Plato. 3 Credits.**

Advanced studies in Plato; emphasis on recent scholarship. Prerequisite: graduate standing in Philosophy.

**PHIL 9060. Aristotle. 3 Credits.**

Advanced studies in Aristotle; emphasis on recent scholarship. Prerequisite: graduate standing in Philosophy.

**PHIL 9070. Medieval Thinkers. 3 Credits.**

Selected works of one or more: Augustine, Avicenna, Anselm, Maimonides, Aquinas, Scotus, Ockham. Not a survey. Prerequisite: graduate standing in Philosophy.

**PHIL 9090. Research in Philosophy. 1-99 Credit.**

Work toward preparation of thesis or dissertation. Graded on a S/U basis only. Prerequisite: graduate standing in Philosophy.

**PHIL 9110. The Rationalists. 3 Credits.**

Interpretation and evaluation of major works of Descartes, Leibniz, and/or Spinoza in relation to their historical context and current philosophical problems. Prerequisite: graduate standing in Philosophy.

**PHIL 9120. The Empiricists. 3 Credits.**

Epistemological and metaphysical doctrines of Locke, Berkeley and Hume. Prerequisite: graduate standing in Philosophy.

**PHIL 9130. Kant. 3 Credits.**

Critique of Pure Reason: historical context, meaning and cohesion of its claims, critical assessment of them. Prerequisite: graduate standing in Philosophy.

**PHIL 9210. Hegel. 3 Credits.**

Phenomenology of Spirit: historical context, meaning and cohesion of its claims, critical assessment of them. Prerequisite: graduate standing in Philosophy.

**PHIL 9220. Marxism. 3 Credits.**

Basic works of Marx and his successors. Prerequisite: graduate standing in Philosophy.

**PHIL 9230. Whitehead. 3 Credits.**

Process and Reality and other works. Contributions to metaphysics, theology, epistemology, and philosophy of science. Prerequisite: graduate standing in Philosophy.

**PHIL 9240. Russell and Wittgenstein. 3 Credits.**

Each initially defends, but then rejects logical atomism. Metaphysical and epistemological themes of such intellectual phases and shifts of one or both philosophers. Prerequisite: graduate standing in Philosophy.

**PHIL 9250. Heidegger. 3 Credits.**

Being and Time: historical context, meaning and cohesion of its claims, critical assessment of them. Prerequisite: graduate standing in Philosophy.

**PHIL 9260. Existentialism. 3 Credits.**

Being and Nothingness and other philosophy and literary works. Prerequisite: graduate standing in Philosophy.

**PHIL 9270. Phenomenology. 3 Credits.**

Selected works of Husserl and other phenomenological thinkers. Implications for epistemology, science, metaphysics, ethics, and other philosophical topics. Prerequisite: graduate standing in Philosophy.

**PHIL 9280. Recent Anglo-American Philosophy. 3 Credits.**

Topics on which current philosophers of the Anglo-American or Analytic tradition are concentrating. Prerequisite: graduate standing in Philosophy.

**PHIL 9290. Recent Continental Philosophy. 3 Credits.**

Topics on which current philosophers on the European continent are concentrating. Prerequisite: graduate standing in Philosophy.

**PHIL 9310. Applied Ethics. 3 Credits.**

Methods for applying normative ethical theories to personal and social moral problems, illustrated by application of consequentialist, deontological and virtue-centered theories to such problems as euthanasia, capital punishment, pornography, world hunger, war and environmentalism. Prerequisite: graduate standing in Philosophy.

**PHIL 9320. Social and Political Philosophy. 3 Credits.**

Topics of current interest in social and political philosophy. generally one of the following: social contract theory, utilitarianism, voting procedures, or convention. Prerequisite: Philosophy [PHIL] 4600 or instructor's consent graduate standing in Philosophy.

**PHIL 9330. Aesthetics. 3 Credits.**

Theories of art and beauty, the aesthetic experience, the physical work of art, the role of the artist; art and other human concerns. Prerequisite: graduate standing in Philosophy.

**PHIL 9340. Topics in the History of Ethics. 3 Credits.**

Advanced study of the ethical views of major historical figures ancient and/or modern. Prerequisite: graduate standing in Philosophy.

**PHIL 9350. History of Eastern Ethics. 3 Credits.**

Historical survey of major eastern ethical theories. Explores broad range of ethical theories developed in Asia: Hindu and Buddhist in India; Taoism and Confucianism in China; and Zen in Japan. Prerequisite: graduate standing in Philosophy.

**PHIL 9510. Decision Theory. 3 Credits.**

Principles for making rational decisions, including principles of expected utility theory, game theory, and social choice theory. A survey of basic ideas and an introduction to selected research topics. Prerequisite: Philosophy [PHIL] 4110; graduate standing in Philosophy.

**PHIL 9520. Ethical Theory. 3 Credits.**

Contemporary theories of the right and the good. Metaethical topics such as moral language, reasoning, and justification. Prerequisite: graduate standing in Philosophy.

**PHIL 9610. Metaphysics. 3 Credits.**

Theories of the categories and structures of reality, e.g., appearance and reality, causality, space and time, God, Nature, the human being. Prerequisite: graduate standing in Philosophy.

**PHIL 9710. Philosophy of Mind and Psychology. 3 Credits.**

Survey of important recent work in contemporary philosophy of mind and psychology. Graduate seminar. Prerequisite: graduate standing in Philosophy.

**PHIL 9720. Foundations of Cognitive Science. 3 Credits.**

Examination of philosophical questions arising in cognitive science concerning, for instance, the nature of computation and representation, inter-disciplinary relations, the nature of cognitive scientific explanation, and its relation to folk psychological explanation. Prerequisite: graduate standing in Philosophy.

**PHIL 9820. Epistemology. 3 Credits.**

Knowledge and opinion, the types, sources, and extent of knowledge, according to a variety of views. Prerequisite: graduate standing in Philosophy.

**PHIL 9830. Philosophy of Science. 3 Credits.**

Examines central issues in general philosophy of science concerning the scientific method and the role in it of observation, the nature of rational theory-choice, progress, and the status of theories postulating unobservables. Prerequisite: graduate standing in Philosophy.

**PHIL 9840. Philosophy of Language. 3 Credits.**

Topics of current interest in the philosophy of language. Prerequisite: Graduate standing in Philosophy.

**PHIL 9850. Philosophy of Biology. 3 Credits.**

Philosophical problems relating to the life sciences, with attention given especially to explanation and reductionism in biology. Prerequisite: graduate standing required.

**PHIL 9887. Seminar in Logic. 3 Credits.**

Topics of current interest in logic. Generally one of the following: inductive logic, set theory, conditionals, epistemic logic, or formal semantics. Prerequisite: Philosophy [PHIL] 4110 graduate standing in Philosophy.

**PHIL 9901. Seminar in Philosophy. 3 Credits.**

Special topics. May be repeated for credit. Prerequisite: graduate standing in Philosophy.

## Physical Medicine And Rehabilitation (PM\_REH)

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**PM\_REH 6351. ABS Physical Medicine/Rehab. Mechanism of Disease. 5-10 Credit.**

ABS Physical Medicine/Rehab. Mechanism of Disease.

**PM\_REH 6353. ABS Physical Medicine/Rehab. Research. 5-10 Credit.**

ABS Physical Medicine/Rehab. Research.

**PM\_REH 6355. ABS Physical Medicine/Rehab. Research and Review. 5-10 Credit.**

ABS Physical Medicine/Rehab. Research and Review.

**PM\_REH 6615. Physical Medicine and Rehabilitation. 5 Credits.**

Physical Medicine and Rehabilitation.

## Physical Therapy (PH\_THR)

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**PH\_THR 1000. Introduction to Physical Therapy. 1 Credit.**

Acquaints students with the physical therapy profession including the required educational preparation, practice settings, sample interventions, current issues, trends and research. Graded on S/U basis only.

**PH\_THR 2420. Biology of Healthy Living. 2 Credits.**

(same as Biomedical Sciences [BIOMED] and Nutritional Science [NUTR\_S] 2420). Biology of inactivity as a casual factor in chronic disease.

**PH\_THR 3022. Principles of Physical Therapy. 1 Credit.**

History of physical therapy: the profession; basic skills: first aid, infection control, vital signs; medical terminology. Graded on S/U basis only.

**PH\_THR 3085. Problems in Physical Therapy. 1-3 Credit.**

Independent study, based upon educational goals, leading to completion of a project or paper. Specific objectives and time line developed with the supervision of a faculty member. Prerequisite: instructor's consent.

**PH\_THR 4085. Problems in Physical Therapy. 1-3 Credit.**

Independent study, based upon educational goals, leading to completion of a project or paper. Specific objectives and time line developed with the supervision of a faculty member. Prerequisite: instructor's consent.

**PH\_THR 4120. Introduction to Clinical Education I. 1 Credit.**

Focus on professional attributes of communication, teamwork, problem solving, and therapeutic behaviors in a case-based format. Graded on S/U basis only.

**PH\_THR 4150. Introduction to Clinical Education II. 1 Credit.**

Continuation of Introduction to Clinical Education I with increased time in clinical settings. Graded on S/U basis only.

**PH\_THR 4240. Applied Neurophysiology for Allied Health Students. 3 Credits.**

(same as Occupational Therapy [OC\_THR] 4240). Principles of basic neurophysiology, emphasizing correlation of structure and function of the nervous system.

**PH\_THR 4250. Human Kinesiology. 3 Credits.**

(same as Health Professions [HTH\_PR] 4250). Study of principles of physical laws, biomechanics and anatomic structure relative to human movement. Applications through analysis of daily functional performance, exercise, and sport. Prerequisite: Human Anatomy.

**PH\_THR 4270. Clinical Pathophysiology. 3 Credits.**

(same as Occupational Therapy [OC\_THR] 4270) Interdisciplinary and case-based examination of the pathophysiology, prevention and general health management of disease/injury across the lifespan encountered in occupational and physical therapy practice. Prerequisite: successful completion of prior professional coursework. Graded on A/F basis only.

**PH\_THR 4330. Physical Agents. 3 Credits.**

Biophysics, theory and technique concerning the use of physical agents as adjuncts to exercise programs. Includes thermal, electrical, light, hydrotherapy and mechanical agents.

**PH\_THR 4420. Foundations of Therapeutic Exercise. 3 Credits.**

Physiological basis of exercise throughout the lifespan with emphasis on the musculoskeletal, neuromuscular, cardiovascular/pulmonary and integumentary systems and the effects of injury and disease on these systems.

**PH\_THR 4480. Medical Testing in Rehabilitation. 3 Credits.**

Diagnostic tests used by disciplines within and outside of physical therapy. Studies include laboratory, nuclear medicine, radiologic, and motion analysis. Emphasis placed on interpretation of results as they apply to physical therapy examination and intervention. Restricted to students accepted into professional major.

**PH\_THR 4510. Evidence-Based Practice. 3 Credits.**

Clinical research design and methods overview. Critical review of current and historically important professional literature. Effective writing related to clinically applicable research using computer and library resources. Identification of research questions. Prerequisite: departmental consent.

**PH\_THR 4520. Applied Therapeutic Exercise. 3 Credits.**

Application of therapeutic exercise with an emphasis on evidenced-based exercise prescription, modes and techniques of exercise typically seen in rehabilitation.

**PH\_THR 4560. Movement Theory and Application. 2 Credits.**

Human sensorimotor development; motor learning; motor control theories; developmental and practical application to exercise; proprioceptive neuromuscular facilitation.

**PH\_THR 4570. Bridging the Clinical-Research Gap. 3 Credits.**

This class focuses on theories of clinical decision making and Evidence-based Practice, their applications to the clinical setting and dissemination of such information to colleagues in professional forums. Graded on A/F basis only.

**PH\_THR 4620. Introduction to Orthopedic Physical Therapy with Laboratory. 3 Credits.**

Physical therapy diagnosis, management, and prevention of disorders of the musculoskeletal system; basics of orthopedic manual therapy. Includes laboratory.

**PH\_THR 4680. Orthopedic Physical Therapy. 3 Credits.**

Physical therapy diagnosis, management, and prevention of disorders of the musculoskeletal system; continuation of orthopedic manual therapy emphasizing the axial skeleton; traction; massage; taping; sport-specific injury rehabilitation; orthotics. Prerequisites: Physical Therapy [PH\_THR] 4620.

**PH\_THR 4730. Pediatric Physical Therapy. 4 Credits.**

Physical therapy evaluation and treatment of children with movement dysfunction. Emphasis on therapeutic exercise.

**PH\_THR 4770. Rehabilitation of the Neurologically Impaired Adult. 4 Credits.**

Physical Therapy evaluation and treatment of adults who have incurred neurological deficits; emphasis on the restorative care of individuals following spinal cord injury, stroke, and traumatic head injury.

**PH\_THR 4790. Pharmacology in Rehabilitation. 2 Credits.**

Principles of pharmacology including pharmacokinetics, pharmacodynamics, and toxicology of common drugs encountered in rehabilitation. Emphasis on pharmacology related to the musculoskeletal, neuromuscular, cardiovascular/pulmonary and integumentary systems across the lifespan. Restricted to students accepted into a professional major.

**PH\_THR 4940. Clinical Education I. 4 Credits.**

Full time, supervised clinical experience addressing application of basic skills in patient evaluation and treatment, documentation and professional behaviors. Graded on S/U basis only.

**PH\_THR 4945. Clinical Education II. 5 Credits.**

Continuation of supervised clinical education. (Capstone course).

**PH\_THR 4960. Special Readings in Physical Therapy. 1-3 Credit.**

Independent readings selected in consultation with supervising faculty member. Identified educational goals and activities; discussion, annotated bibliography or report. Prerequisite: instructor's consent.

**PH\_THR 4965. Directed Readings in Physical Therapy. 1-99 Credit.**

Selected readings on specific topics. Prerequisite: instructor's consent.

**PH\_THR 4980. Clinical Evaluation and Procedures with Laboratory. 3 Credits.**

Principles and procedures of basic evaluation methods and documentation: muscle strength, range of motion, muscle balance, posture, neurologic tests. Includes laboratory.

**PH\_THR 4981. Clinical Kinesiology with Laboratory. 3 Credits.**

Advanced Kinesiology addressing functional mobility; specifics of normal human gait; pathokinetics of gait. Assistive devices; wheelchairs; orthoses and prostheses. Includes laboratory.

**PH\_THR 7120. Introduction to Clinical Education I. 1 Credit.**

Focus on professional attributes of communication, teamwork, problem solving, and therapeutic behaviors in a case-based format. Graded on S/U basis only. Prerequisite: graduate standing.

**PH\_THR 7150. Introduction to Clinical Education II. 1 Credit.**

Continuation of Introduction to Clinical Education I with increased time in clinical settings. Graded on S/U basis only. Prerequisite: graduate standing.

**PH\_THR 7240. Applied Neurophysiology for Allied Health Students. 3 Credits.**

(same as Occupational Therapy [OC\_THR] 4240/7240). Principles of basic neurophysiology, emphasizing correlation of structure and function of the nervous system. Prerequisite: graduate standing.

**PH\_THR 7250. Human Kinesiology. 3 Credits.**

(same as Health Professions [HTH\_PR] 4250, Occupational Therapy [OC\_THR] 4220/7220). Study of principles of physical laws, biomechanics and anatomic structure relative to human movement. Applications through analysis of daily functional performance, exercise, and sport. Prerequisite: graduate standing and Human Anatomy.

**PH\_THR 7270. Clinical Pathophysiology. 3 Credits.**

(same as Occupational Therapy [OC\_THR] 4270/7270) Interdisciplinary and case-based examination of the pathophysiology, prevention and

general health management of disease/injury across the lifespan encountered in occupational and physical therapy practice.

**PH\_THR 7330. Physical Agents. 3 Credits.**

Biophysics, theory and technique concerning the use of physical agents as adjuncts to exercise programs. Includes thermal, electrical, light, hydrotherapy and mechanical agents. Prerequisite: graduate standing.

**PH\_THR 7420. Foundations of Therapeutic Exercise. 3 Credits.**

Physiologic basis of exercise throughout the lifespan with emphasis on the musculoskeletal, neuromuscular, cardiovascular/ pulmonary and integumentary systems and the effects of injury and disease on these systems.

**PH\_THR 7480. Medical Testing in Rehabilitation. 3 Credits.**

Diagnostic test used by disciplines within and outside of physical therapy. Studies include laboratory, nuclear medicine, radiologic, and motion analysis. Emphasis placed on interpretation of results as they apply to physical therapy examination and intervention. Restricted to students accepted into professional major.

**PH\_THR 7510. Evidence-Based Practice. 3 Credits.**

Clinical research design and methods overview. Critical review of current and historically important professional literature. Effective writing related to clinically applicable research using computer and library resources. Identification of research questions. Prerequisite: graduate standing and departmental consent.

**PH\_THR 7520. Applied Therapeutic Exercise. 3 Credits.**

Application of therapeutic exercise with an emphasis on evidenced-based exercise prescription, modes and techniques of exercise typically seen in rehabilitation.

**PH\_THR 7570. Bridging the Clinical-Research Gap. 3 Credits.**

This class focuses on theories of clinical decision making and Evidence-based Practice, their applications to the clinical setting and dissemination of such information to colleagues in professional forums. Graded on A/F basis only.

**PH\_THR 7620. Introduction to Orthopedic Physical Therapy with Laboratory. 3 Credits.**

Physical therapy diagnosis, management, and prevention of disorders of the musculoskeletal system; basics of orthopedic manual therapy. Includes laboratory. Prerequisite: graduate standing.

**PH\_THR 7680. Orthopedic Physical Therapy. 3 Credits.**

Physical therapy diagnosis, management, and prevention of disorders of the musculoskeletal system; continuation of orthopedic manual therapy emphasizing the axial skeleton; traction; massage; taping; sport-specific injury rehabilitation; orthotics. Prerequisites: graduate standing and Physical Therapy [PH\_THR] 4620.

**PH\_THR 7730. Pediatric Physical Therapy. 4 Credits.**

Physical therapy evaluation and treatment of children with movement dysfunction. Emphasis on therapeutic exercise. Prerequisite: graduate standing.

**PH\_THR 7770. Rehabilitation of the Neurologically Impaired Adult. 4 Credits.**

Physical Therapy evaluation and treatment of adults who have incurred neurological deficits; emphasis on the restorative care of individuals following spinal cord injury, stroke, and traumatic head injury. Prerequisite: graduate standing.

**PH\_THR 7780. Differential Diagnosis in Physical Therapy. 3 Credits.**

Evidence-based clinical decision making emphasizing health screenings and system review to determine physical therapy diagnosis/need for referral to other health care professionals. Restricted to students accepted into the professional major.

**PH\_THR 7790. Pharmacology in Rehabilitation. 2 Credits.**

Principles of pharmacology including pharmacokinetics, pharmacodynamics, and toxicology of common drugs encountered in rehabilitation. Emphasis on pharmacology related to the musculoskeletal, neuromuscular, cardiovascular/ pulmonary and integumentary systems across the lifespan. Restricted to students accepted into professional major.

**PH\_THR 7890. Case Management I. 5 Credits.**

Evaluation and team approach to physical therapy management in adult medical and surgical conditions: cardiopulmonary, rheumatic, oncologic, integumentary or wound care, including major burn injury. Psychosocial and ethical issues incorporated. Problem based; laboratory.

**PH\_THR 7940. Clinical Education I. 4 Credits.**

Full time, supervised clinical experience addressing application of basic skills in patient evaluation and treatment, documentation and professional behaviors. Graded on S/U basis only. Prerequisite: graduate standing.

**PH\_THR 7945. Clinical Education II. 5 Credits.**

Continuation of supervised clinical education. (Capstone course). Prerequisite: graduate standing. Graded S/U only.

**PH\_THR 7960. Special Readings in Physical Therapy. 1-3 Credit.**

Independent readings selected in consultation with supervising faculty member. Identified educational goals and activities; discussion, annotated bibliography or report. Prerequisite: graduate standing and instructor's consent.

**PH\_THR 7965. Directed Readings in Physical Therapy. 1-99 Credit.**

Selected readings on specific topics. Prerequisite: graduate standing and instructor's consent.

**PH\_THR 7980. Clinical Evaluation and Procedures with Laboratory. 3 Credits.**

Principles and procedures of basic evaluation methods and documentation: muscle strength, range of motion, muscle balance, posture, neurologic tests. Includes laboratory. Prerequisite: graduate standing.

**PH\_THR 7981. Clinical Kinesiology with Laboratory. 3 Credits.**

Advanced Kinesiology addressing functional mobility; specifics of normal human gait; pathokinetics of gait. Assistive devices; wheelchairs; orthoses and prostheses. Includes laboratory. Prerequisite: graduate standing.

**PH\_THR 8001. Topics in Physical Therapy. 1-99 Credit.**

Organized study of selected topics in physical therapy, health and wellness, prevention of disease and disability, and the rehabilitation sciences. Specific content may vary from semester to semester. Prerequisite: instructor's consent.

**PH\_THR 8085. Problems in Physical Therapy. 1-3 Credit.**

Independent study and development of a clinical or research paper, poster or workshop suitable for presentation in a symposium or conference. Specific plan individually developed with advisor. Journal reviews. Prerequisites: graduate standing.

**PH\_THR 8087. Seminar in Physical Therapy. 3 Credits.**

Presentation and critical discussion of research activities, summaries of clinical and research experience. Prerequisite: departmental consent.

**PH\_THR 8130. Professional Issues in the 21st Century. 3 Credits.**

The physical therapist as health care professional, administrator, and educator; legal, ethical, and political issues. Service delivery management; delegation of care; rural vs. urban health care needs.

**PH\_THR 8390. Case Management II with Laboratory. 5 Credits.**

Complex orthopedic problems in persons of all ages; supervision, reimbursement, ethical/legal situations; community programs for injury prevention; work capacity evaluation/work hardening; consultation. Problem-based format; laboratory. Prerequisite: Physical Therapy [PH\_THR] 7890.

**PH\_THR 8690. Case Management III with Laboratory. 5 Credits.**

Traditional and contemporary theories of physical therapy in advanced rehabilitation of children and adults with neurologic disorders; education/employment, ethical/legal issues; patient/client advocacy. Problem based format; laboratory. Prerequisite: Physical Therapy [PH\_THR] 8390.

**PH\_THR 8940. Clinical Education III. 6-8 Credit.**

A continuation of supervised clinical education. Graded on S/U basis only.

**PH\_THR 8945. Clinical Education IV. 5 Credits.**

A continuation of supervised clinical education. Graded on S/U basis only.

**PH\_THR 8950. Clinical Education V. 5 Credits.**

Full time supervised clinical education. Terminal clinical experience with advanced expectations of performance. Restricted to students accepted into professional major. Graded on S/U basis only.

## Physics (PHYSCS)

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**PHYSCS 1002. Topics in Physics and Astronomy. 1-3 Credit.**

Study of selected topics in physics and astronomy. Subjects and earnable credit may vary from semester to semester.

**PHYSCS 1050. Concepts in Cosmology. 3 Credits.**

Introduction to fundamental concepts of modern cosmology. Topics include Olbers' paradox, Hubble expansion, Big Bang, and the Cosmic Microwave Background Radiation.

**PHYSCS 1100. Science and Inventions. 1 Credit.**

This course covers the history of some of the most important inventions in science and their impact on past civilizations, current advances in science and inventions, funding and policies, and critical advances in technology required for future generations.

**PHYSCS 1150. Concepts in Physics. 3 Credits.**

Introduction to fundamental concepts of physics for non-science majors. Concepts include the conservation of energy, the second law of thermodynamics, and the special theory of relativity. Students learn to reason and apply these concepts through writing assignments.

**PHYSCS 1210. College Physics I. 4 Credits.**

First course in algebra-based physics. Covers kinematics, dynamics, fluids oscillatory motion, waves and thermodynamics. Three lectures, one lab weekly. Prerequisite: Mathematics [MATH] 1100/1120. Math Reasoning Proficiency Course.

**PHYSICS 1220. College Physics II. 4 Credits.**

Continuance of 1210. Covers electricity and magnetism, optics and modern physics. Three lectures, one lab weekly. Prerequisite: grade of C- or better in Physics [PHYSICS] 1210. Math Reasoning Proficiency Course.

**PHYSICS 1440. Physics of Sound and Music. 2 Credits.**

The course will be an introduction to acoustics, and the role that fundamentals physics plays in determining what we hear. No formal physics or music background is required, though the ability to read music is preferable. Topics covered will include standing waves, the harmonic series, synthesis, the response of the human ear, different tuning systems, and characteristics of different families of instruments. Prerequisite: Mathematics [MATH] 1100/1120.

**PHYSICS 2002. Topics in Physics and Astronomy - Physical Science. 1-3 Credit.**

Study of selected topics in physics and astronomy. Subjects and earnable credit may vary from semester to semester. Prerequisite: College Algebra. Course may be repeated for credit.

**PHYSICS 2100. Thinking Physics. 3 Credits.**

This course investigates motion and force and the relationship between them. Problem-solving skills will be emphasized in addition to hands-on inquiry and deep conceptual understanding. This course is intended to help prepare students for College Physics I or University Physics I. Prerequisites: Mathematics [MATH] 1100. Graded on A/F basis only.

**PHYSICS 2330. Exploring the Principles of Physics. 4 Credits.**

A hands-on course covering topics in Matter, Mechanics, Energy, Light, Sound, Electricity and Magnetism. Pedagogy reflects styles used in K-12 classrooms; emphasis on inquiry, concept development, quantitative applications and technology. Prerequisite: Mathematics [MATH] 1100/1120 and sophomore standing required.

**PHYSICS 2750. University Physics I. 5 Credits.**

First course in calculus-based physics for science and engineering students. Covers kinematics, dynamics, oscillations, waves, fluids and thermodynamics. Includes a laboratory. Prerequisite: Mathematics [MATH] 1500 or equivalent. Corequisite: MATH 1700.

**PHYSICS 2750H. University Physics I - Honors. 5 Credits.**

First course in calculus-based physics for science and engineering students. Covers kinematics, dynamics, oscillations, waves, fluids, and thermodynamics. Includes a laboratory. Prerequisite: Mathematics [MATH] 1500 or equivalent. Co-requisite: MATH 1700. Honors eligibility required. Graded A-F only.

**PHYSICS 2760. University Physics II. 5 Credits.**

Continuation of Physics [PHYSICS] 2750. Covers electrostatics, elementary circuits, magnetism, electromagnetic phenomena, optics, matter waves and particles and modern physics. Includes a laboratory. Prerequisites: Mathematics [MATH] 1700 and grade of - or better in PHYSICS 2750. Corequisite: MATH 2300.

**PHYSICS 2800. Undergraduate Seminar in Physics. 2 Credits.**

Introduction to the Physics Department and presentation of topics of current interest in physics by faculty and students. Intended for physics majors at the freshman or sophomore level only.

**PHYSICS 3002. Topics in Physics and Astronomy - Physical Science. 1-3 Credit.**

Study of selected topics in physics and astronomy. Subjects and earnable credit may vary from semester to semester. Prerequisite: Physics [PHYSICS] 1210 or 2750. May be repeated for credit.

**PHYSICS 3010. Introduction to Modern Astrophysics. 3 Credits.**

(same as Astronomy [ASTRON] 3010). Elements of stellar, and galactic astrophysics. Interpretation of observations and physical conditions of various astronomical objects including stars, gaseous nebulae and galaxies. Prerequisite: Physics [PHYSICS] 2760.

**PHYSICS 3020. Astrophysical Techniques. 3 Credits.**

(same as Astronomy [ASTRON] 3020). Elements of modern astronomical instruments, observations and analysis. Prerequisite: Physics [PHYSICS] 3010 or concurrently.

**PHYSICS 3100. Teaching Physics. 3 Credits.**

Introduces modeling and inquiry methods of teaching about force, motion, energy, electricity and magnetism. Students learn research-base physics teaching methods, including eliciting prior understanding, facilitating conceptual change, and active learning strategies. Prerequisite: PHYSICS 1220 or PHYSICS 2760.

**PHYSICS 3150. Introduction to Modern Physics. 3 Credits.**

Relativistic kinematics and Lorentz transformations; historical basis for quantum mechanics; atomic structure; physics of solids; nuclear structure and decay. Prerequisite: Physics [PHYSICS] 2760.

**PHYSICS 4050. Electronic Laboratory. 4 Credits.**

Acquaints students with the foundations and techniques of electronics design, with emphasis on data acquisition and processing. Topics: circuits with discrete and integrated circuits, active and passive filters, amplifiers, power supplies, instrumentation and interfacing. Integrated lectures and labs. Prerequisite: Physics [PHYSICS] 2760.

**PHYSICS 4060. Advanced Physics Laboratory I. 3 Credits.**

Experiments in atomic, nuclear and solid state physics including X-ray and neutron diffraction, NMR and Mossbauer effect measurements. Experiments familiarize students with modern equipment found in most physics laboratories. Two 3-hour labs weekly. Prerequisites: Physics [PHYSICS] 3150.

**PHYSICS 4080. Major Themes in Classical Physics. 3 Credits.**

Introduction to classical physics: mechanics, electromagnetism and thermodynamics, emphasizing the unity and the connections between different parts of it. Prerequisite: Physics [PHYSICS] 2760.

**PHYSICS 4100. Electricity and Magnetism I. 3 Credits.**

Mathematical preliminaries, properties of charge distributions at rest and in motion, the field concept, introduces electromagnetic radiation. Prerequisites: Physics [PHYSICS] 2760.

**PHYSICS 4102. Topics on Physics and Astronomy-Biological/Physical/Mathematics. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: Physics [PHYSICS] 2760 or instructor's consent, departmental consent for repetition.

**PHYSICS 4110. Light and Modern Optics. 4 Credits.**

Interaction of light with matter, spectroscopic techniques, wave optics, interferometry, multilayer films, polarization, non-linear optics, design of optical instruments, matrix methods, waveguides, fiber optics, acousto-optic and photo-elastic modulation. Includes both lectures and laboratory. Prerequisite: Physics [PHYSICS] 2760.

**PHYSICS 4120. Introduction to Thermodynamics. 3 Credits.**

Development of the concepts of temperature, heat, work, entropy, enthalpy and free energy. Applications to gases, liquids and solids. Statistical methods. Prerequisite: Physics [PHYSICS] 2760.

**PHYSCS 4130. Electricity and Magnetism II. 3 Credits.**

Application of Maxwell's equations. Prerequisite: Physics [PHYSCS] 4100.

**PHYSCS 4140. Mechanics. 3 Credits.**

Development of fundamental concepts, principles of mechanics using mathematical methods. Many problems used. Prerequisite: Physics [PHYSCS] 2760.

**PHYSCS 4180. Solar System Science. 3 Credits.**

(same as Geology [GEOL] 4180 and Astronomy [ASTRON] 4180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution. Prerequisites: Physics [PHYSCS] 1220 or 2760 or instructor's consent.

**PHYSCS 4190. Physics and Chemistry of Materials. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 4319, Biological Engineering [BIOL\_EN] 4480 and Chemistry [CHEM] 4490). This course will cover fundamental and applied aspects relating to the Physics, Chemistry and Biology of materials with special emphasis on Nanoscience and Nanomedicine. Consists of lectures and experiments in Nanoscience. Prerequisite: Physics [PHYSCS] 2760 and CHEM 1320 or equivalent and instructor's consent.

**PHYSCS 4230. Scanning Electron Microscopy and X-ray Microanalysis. 3 Credits.**

This course is designed for senior undergraduate/graduate students. This course covers the basic principles and practical considerations using the scanning electron microscope (SEM) and energy-dispersive spectrometry (EDS) in the characterization of materials. Prerequisite: Physics [PHYSCS] 3150 and instructor's consent. Graded on A/F basis only.

**PHYSCS 4250. Stellar Astrophysics. 3 Credits.**

(same as Astronomy [ASTRON] 4250). Basic astrophysics of stable and unusual stars, stellar systems. Investigates stellar dimensions, radiation, spectra, energy, evolution, populations; interstellar medium, stellar motions and aggregation. Prerequisite: Physics [PHYSCS] 3150 or concurrently or instructor's consent.

**PHYSCS 4310. Physics in Cell and Developmental Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 4310). Discusses the role of physical mechanisms in specific cellular and developmental processes and phenomena, in particular those characterizing the embryonic stage of multicellular organisms. Each process and phenomenon is first described in biological terms and then within a physical model, with special emphasis on the interplay between the two descriptions. Prerequisite: Physics [PHYSCS] 1220 or 2760 and BIO\_SC 2300 or instructor's consent.

**PHYSCS 4350. Galactic Astronomy. 3 Credits.**

(same as Astronomy [ASTRON] 4350). Observational properties of normal galaxies and clusters of galaxies, Seyfert and emission-line structure and dynamics of galaxies; interacting galaxies, quasi-stellar objects. Introduction to cosmology. Prerequisites: Physics [PHYSCS] 3010, 4140 or instructor's consent.

**PHYSCS 4360. Extragalactic Astronomy. 3 Credits.**

This course introduces students to the most basic knowledge of extragalactic astronomy, starting from Milky Way and extending to the most distant universe. Topics covered will include galaxy morphology and

classification, groups and clusters of galaxies, active galactic nuclei, and galaxy formation and evolution. Prerequisite: Physics [PHYSCS] 2760.

**PHYSCS 4390. Problems in Physics. 1-99 Credit.**

Problems in Physics.

**PHYSCS 4400. The Physics of Electronic Devices. 3 Credits.**

This course is designed for graduate and undergraduate students of Physics and Electrical Engineering who have an interest in learning the basic physical idea underlying the operation of electronic devices. The course consists of lectures, handout lecture notes, problem sets, two mid-term and one final exam. Prerequisites: A basic knowledge of modern physics (electromagnetism and quantum mechanics at the level of Physics [PHYSCS] 3150 or equivalent, or instructor's consent. Graded on A/F basis only.

**PHYSCS 4410. Analysis of Biological Macromolecules and Biomaterials. 3 Credits.**

This interdisciplinary, team-taught course introduces basic concepts and experimental techniques for studying bio-macromolecules and biomaterials. A Problem Based Learn/Writing Intensive approach uses four modules: Proteins, membranes, cellular interactions and biomaterials. Prerequisite: Physics [PHYSCS] 2760.

**PHYSCS 4420. Introduction to Biomedical Imaging. 3 Credits.**

This course offers a broad introduction to medical imaging. Topics to be covered include the physics basics and instrumentation of X-ray, CT, PET, SPECT, ultrasound, MRI, and optical imaging, as well as recent developments in biomedical imaging. Prerequisites: Physics [PHYSCS] 2760.

**PHYSCS 4450. Introduction to Cosmology. 3 Credits.**

Develops the physical concepts necessary for understanding the major recent discoveries in cosmology, such as the acceleration of the universe and dark energy. No prior knowledge of general relativity is assumed. Prerequisite: Physics [PHYSCS] 3150 or equivalent or instructor's consent. Graded on A/F basis only.

**PHYSCS 4460. Interstellar Medium. 3 Credits.**

(same as ASTRON 4460). The course discusses observational properties and physical and chemical processes occurring in the interstellar medium. Topics include interstellar diffuse and molecular clouds, HII regions, dust grains, interstellar chemistry, star formation, supernova remnants, and interstellar shock waves. Prerequisite: PHYSCS 1220.

**PHYSCS 4500. Computational Biological Physics. 3 Credits.**

Provides a practical introduction (hands-on approach) to the study of the structure and function of biomolecular systems by employing computational methods and theoretical concepts familiar from the physical sciences. Prerequisite: Physics [PHYSCS] 1220 or 2760 or instructor's consent.

**PHYSCS 4510. Single Molecule Biophysics. 3 Credits.**

The course provides an overview of the biophysics of enzymes, nucleic acids and the cytoskeleton. Topics covered will include diffusion, molecular motors, polymerization and the cytoskeleton and the polymer properties of nucleic acids and microtubules Prerequisite: PHYSCS 2760.

**PHYSCS 4550. Cosmochemistry. 3 Credits.**

(same as Astronomy [ASTRON] 4550/7550). Cosmic dust, stardust, spectra, energy, interstellar medium, meteorites, astromineralogy. Prerequisites: Physics [PHYSCS] 2760 or 1220. Instructor's consent required.

**PHYSICS 4600. Semiconductor Optics. 3 Credits.**

It is an introductory-level course in the field of optical processes in semiconductors (both inorganic and organic) and solid-state optoelectronics, designed both for graduate and undergraduate students of Physics, Chemistry and Electrical Engineering. Prerequisites: Physics [PHYSICS] 3150 or instructor's consent. Graded on A/F basis only.

**PHYSICS 4650. Modern Condensed Matter Physics. 3 Credits.**

Introduces the basic concepts and gives an overview of the latest developments of modern condensed-matter physics as the forefront of (nano) science and technology. Combines lectures and computational laboratory, where students use and develop interactive computer simulations. Prerequisites: Physics [PHYSICS] 3150 or instructor's consent. Graded on A/F basis only.

**PHYSICS 4700. Introduction to Methods in Mathematical Physics. 3 Credits.**

Introduces mathematical methods and theories of physics. Topics usually covered are complex analysis, partial differential equations, integral equations and tensor analysis. Prerequisite: Mathematics [MATH] 4100.

**PHYSICS 4800. Introduction to Quantum Mechanics I. 3 Credits.**

Foundations of wave mechanics; wave packets; Schrodinger equation and I-D problems; operators and eigenfunctions, spherically symmetric systems. Prerequisite: Mathematics [MATH] 4100.

**PHYSICS 4810. Introduction to Quantum Mechanics II. 3 Credits.**

Review of quantum mechanics and units, forms of radiation, radiation detectors, spacetime symmetries, internal symmetries, nuclear structure and form factors, low-energy nuclear models, recent developments. Prerequisite: Physics [PHYSICS] 4800 or equivalent.

**PHYSICS 4850. Computational Methods in Physics. 3 Credits.**

Use of modern computational techniques in solving a wide variety of problems in solid state, nuclear, quantum and statistical physics. Prerequisite: Physics [PHYSICS] 4800 or instructor's consent.

**PHYSICS 4950. Undergraduate Research in Physics. 1-3 Credit.**

Special studies for advanced undergraduate students in physics covering subjects not included in courses regularly offered. Prerequisites: instructor's consent, departmental consent for repetition.

**PHYSICS 4960. Senior Thesis in Physics. 3 Credits.**

Special studies for senior undergraduate students in physics. The course requires an oral or poster presentations, or faculty-guided writing of a senior thesis involving independent research. Prerequisites: instructor's consent and 3 units of Physics [PHYSICS] 4950. Departmental consent required for repetition.

**PHYSICS 4985. Issues in Modern Physics and Engineering. 3 Credits.**

Students are expected to write a major paper on a selected topic from modern physics or engineering. The paper will review the current state of the experimental and theoretical research on the topic at a level appropriate to their peers. Prerequisite: Physics [PHYSICS] 3150 or instructor's consent.

**PHYSICS 7085. Problems in Physics. 1-99 Credit.**

Laboratory work involving study of literature of special experiments in physics. Introduces research methods.

**PHYSICS 7087. Seminar in Physics. 1 Credit.**

Topics of current interest selected for discussion. May be elected repeatedly. S/U Graded only. Prerequisite: Physics [PHYSICS] 8150.

**PHYSICS 7110. Light and Modern Optics. 4 Credits.**

Interaction of light with matter, spectroscopic techniques, wave optics, interferometry, multilayer films, polarization, non-linear optics, design of optical instruments, matrix methods, waveguides, fiber optics, acousto-optic and photo-elastic modulation. Includes both lectures and laboratory. Prerequisite: Physics [PHYSICS] 2760.

**PHYSICS 7180. Solar System Science. 3 Credits.**

(same as Geology [GEOL] and Astronomy [ASTRON] 7180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution. Prerequisites: Physics [PHYSICS] 1220 or 2760 or instructor's consent.

**PHYSICS 7190. Physics and Chemistry of Materials. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 7319, Biological Engineering [BIOL\_EN] 7480 and Chemistry [CHEM] 7490). This course will cover fundamental and applied aspects relating to the Physics, Chemistry and Biology of materials with special emphasis on Nanoscience and Nanomedicine. Consists of lectures and experiments in Nanoscience. Prerequisites: Physics [PHYSICS] 2760 and CHEM 1320 or equivalent and instructor's consent.

**PHYSICS 7201. Topics in Physics. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Instructor's consent required.

**PHYSICS 7230. Scanning Electron Microscopy and X-ray Microanalysis. 3 Credits.**

This course is designed for senior undergraduate/graduate students and covers the basic principles and practical considerations using the scanning electron microscope (SEM) and energy-dispersive spectrometry (EDS) in the characterization of materials. The structure of the course consists of a series of lectures followed by computer simulation labs covering the lecture topics. This is followed by hands-on lab assignments reinforcing the same material while also servicing as operational training and analytical methods. Also covered in this course is a sample preparation techniques, digital imaging and data acquisition and processing. Prerequisites: Physics [PHYSICS] 3150 and instructor's consent.

**PHYSICS 7301. Topics in Astronomy and Astrophysics. 3 Credits.**

Selected topics from solar system, stellar, galactic and extragalactic astronomy, and astrophysics. May be repeated for credit. Graded on A/F basis only.

**PHYSICS 7310. Physics in Cell and Developmental Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 7310 and Medical Pharmacology and Physiology [MPP] 7300). Discusses the role of physical mechanisms in specific cellular and developmental processes and phenomena, in particular those characterizing the embryonic stage of multicellular organisms. Each process and phenomenon is first described in biological terms and then within a physical model, with special emphasis on the interplay between the two descriptions. Prerequisite: Physics [PHYSICS] 1220 or 2760 and Biological Science [BIO\_SC] 2300 or instructor's consent.

**PHYSICS 7360. Extragalactic Astronomy. 3 Credits.**

This course introduces students to the most basic knowledge of extragalactic astronomy, starting from Milky Way and extending to the most distant universe. Topics covered will include galaxy morphology and classification, groups and clusters of galaxies, active galactic nuclei, and galaxy formation and evolution. Prerequisite: Physics [PHYSICS] 2760.



**PHYSCS 7400. Physics of Electronic Devices. 3 Credits.**

This course is designed for graduate students of Physics and Electrical Engineering who have an interest in learning the basic physical idea underlying the operation of electronic devices. The course consists of lectures, handout lecture notes, problem sets, two mid-term and one final exam. Prerequisites: a basic knowledge of modern physics (electromagnetism and quantum mechanics) at the level of Physics [PHYSCS] 3150 or equivalent, or approval by instructor's.

**PHYSCS 7410. Analysis of Biological Macromolecules and Biomaterials. 3 Credits.**

This interdisciplinary, team-taught course introduces basic concepts and experimental techniques for studying bio-macromolecules and biomaterials. A Problem Based Learn/Writing Intensive approach uses four modules: proteins, membranes, cellular interactions and biomaterials. Prerequisite: Physics [PHYSCS] 2760.

**PHYSCS 7420. Introduction to Biomedical Imaging. 3 Credits.**

(same as BIOL\_EN 7420). This course offers a broad introduction to medical imaging. Topics to be covered include the physics basics and instrumentation of X-ray CT, PET, SPECT, ultrasound, MRI, and optical imaging, as well as recent developments in biomedical imaging. Prerequisites: PHYSCS 2760.

**PHYSCS 7450. Introduction to Cosmology. 3 Credits.**

Develops the physical concepts necessary for understanding the major recent discoveries in cosmology, such as the acceleration of the universe and dark energy. No prior knowledge of general relativity is assumed. Prerequisite: PHYSCS 3150 or equivalent or instructor's consent. Graded on A/F basis only.

**PHYSCS 7500. Computational Biological Physics. 3 Credits.**

Provides a practical introduction (hands-on approach) to the study of the structure and function of biomolecular systems by employing computational methods and theoretical concepts familiar from the physical sciences. Prerequisite: graduate standing and Physics [PHYSCS] 1220 or 2760 or instructor's consent.

**PHYSCS 7550. Cosmochemistry. 3 Credits.**

(same as Astronomy [ASTRON] 7550). Chemistry of cosmic dust and molecules. Prerequisites: Physics [PHYSCS] 2760 or 1220; instructor's consent.

**PHYSCS 7600. Semiconductor Optics. 3 Credits.**

It is an introductory-level course in the field of optical processes in semiconductors (both inorganic and organic) and solid-state optoelectronics, designed both for graduate and undergraduate students of Physics, Chemistry and Electrical Engineering. Prerequisites: Physics [PHYSCS] 3150 or instructor's consent.

**PHYSCS 7650. Modern Condensed Matter Physics. 3 Credits.**

Introduces the basic concepts and gives an overview of the latest developments of modern condensed matter physics as the forefront of (nano) science and technology. Combines lectures and computational laboratory, where students use and develop interactive computer simulations. Prerequisites: Physics [PHYSCS] 3150 or instructor's consent. Graded on A/F basis only.

**PHYSCS 7750. Interstellar Medium. 3 Credits.**

The course discusses observational properties and physical and chemical processes occurring in the interstellar medium. Topics include interstellar diffuse and molecular clouds, HII regions, dust grains, interstellar chemistry, star formation, supernova remnants, and interstellar shock

waves. Prerequisite: Physics [PHYSCS] 1220. Graduate Standing Required.

**PHYSCS 7850. Computational Methods in Physics. 3 Credits.**

Use of modern computational techniques in solving a wide variety of problems in solid state, nuclear, quantum and statistical physics. Prerequisite: Physics [PHYSCS] 4800 or instructor's consent.

**PHYSCS 8040. Study of Techniques of Teaching College Physics. 1-3 Credit.**

Objectives, methods and problems related to teaching college physics. Some credit in this course is required for all students teaching physics. May repeat for 3 hours maximum.

**PHYSCS 8090. Research in Physics. 1-99 Credit.**

Graduate research. Graded on S/U Basis only.

**PHYSCS 8101. Topics of Physics and Astronomy. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: instructor's consent. Departmental consent for repetition.

**PHYSCS 8110. Physics for High School Teachers I. 4 Credits.**

This is a physics course designed primarily for high school teachers. Topics include motion, forces, Newton's Laws, electricity, k and magnetism. The course uses research based pedagogical methods utilizing inquiry, modeling, and hands-on techniques. Prerequisite: instructor's consent. Graded on A/F basis only.

**PHYSCS 8120. Physics for High School Teachers II. 4 Credits.**

This is a physics course designed primarily for high school teachers. Topics include applications of Newton's laws, energy, waves, optics, heat, and astronomy. The course uses research based pedagogical methods utilizing inquiry modeling, and hands-on techniques. Prerequisite: instructor's consent. Graded on A/F basis only.

**PHYSCS 8130. Physics for High School Teachers 3. 2 Credits.**

This is a physics course designed primarily for high school teachers. Topics include modern physics and history of science. The course uses research based pedagogical methods utilizing inquiry, modeling, and hands-on techniques. Prerequisite: instructor's consent. Graded on A/F basis only.

**PHYSCS 8150. Condensed Matter Physics I. 3 Credits.**

Crystal structure, reciprocal lattice, phonons, neutron and x-ray scattering, free electron theory of metals, Fermi surfaces, energy bands, static properties of solids, semiconductors, devices, and quantum structures, optical properties, excitons, introduction to magnetism and superconductivity. Prerequisites: Physics [PHYSCS] 4800 or equivalent.

**PHYSCS 8160. Condensed Matter Physics II. 3 Credits.**

The basic Hamiltonian, Phonons, theory of the electron gas, second quantization, Hartree and Hartree-Fock approximation, local-density method, tight-binding theory, electron-electron interaction and screening, Fermi liquid theory, transport properties, impurities, Green's function's, Localization, Quantum Hall effect, magnetism, superconductivity. Prerequisites: Physics [PHYSCS] 8150.

**PHYSCS 8301. Topics in Astronomy and Astrophysics. 3 Credits.**

(same as Astronomy [ASTRON] 8301). Selected topics from solar system, stellar, galactic and extragalactic astronomy and astrophysics. May be repeated to a maximum of six hours. Prerequisite: instructor's consent.

**PHYSICS 8350. Science Outreach: Public Understanding of Science. 1-2 Credit.**

(same as Biological Sciences [BIO\_SC] and Animal Sciences [AN\_SCI] 8725) This course is aimed at promoting public understanding and appreciation of science. The students will develop presentations that increase awareness of the impact of science on many aspects of our daily lives. Graduate Standing or instructor's consent required.

**PHYSICS 8400. Low Energy Neutron Scattering. 3 Credits.**

Theory, application of low energy neutron scattering to investigation of structure and dynamics of aggregate matter including lattice vibrations, ordered spin systems, spin waves, diffusive motions in liquids; experimental techniques discussed. Prerequisite: Physics [PHYSICS] 8150.

**PHYSICS 8410. Concepts in Nanoscale Materials: Interdisciplinary Science. 3 Credits.**

This interdisciplinary course covers basic concepts in nanoscale materials, their characterization, and how and why they differ from conventional bulk materials. The course focuses on neutron scattering methods and uses lectures, problem-based modules, and writing assignments. Prerequisites: Physics [PHYSICS] 3150 and instructor's consent.

**PHYSICS 8450. Plasma Physics. 3 Credits.**

Single particle motion, plasma kinetic theory, magnetohydrodynamics and other fluid theories, waves in unmagnetized and magnetized plasmas, transport phenomena, instabilities, controlled fusion. Prerequisite: instructor's consent.

**PHYSICS 8550. Stellar Structure and Evolution. 3 Credits.**

(same as Astronomy [ASTRON] 8550). Reviews of atomic and molecular spectra. Investigates quantum radiation law, emission and absorption processes, radiation transfer theory, continuous and discrete line spectra of stars, stellar composition. Prerequisite: Physics [PHYSICS] 4250, 4800, or instructor's consent.

**PHYSICS 8560. Quantitative X-Ray Microanalysis and Advanced Imaging. 3 Credits.**

This course covers the theory and methodology to quantitatively analyze materials using both energy-dispersive (EDS) and wavelength-dispersive (WDS) spectrometry. Other topics include chemical mapping and data extraction using image processing and analysis techniques. Prerequisites: Physics [PHYSICS] 7230.

**PHYSICS 8610. Classical Mechanics. 3 Credits.**

The interplay of dynamics and symmetry, Hamilton's principle and Noether's theorem, Lagrangian, Hamiltonian, Hamilton-Jacobi theories of mechanics in special relativity. Rigid body motion, small oscillation, canonical transformations and fields as continuous mechanical systems. Prerequisites: Physics [PHYSICS] 4140 or equivalent.

**PHYSICS 8620. Electrodynamics I. 3 Credits.**

Electrostatic potential and fields, boundary-value problems in electrostatics, methods of images, Green's functions, multipole expansion, dielectrics, magnetostatics, magnetic materials, Maxwell's equations, time-varying fields. Prerequisites: Physics [PHYSICS] 8610 or instructor's consent.

**PHYSICS 8640. Electrodynamics II. 3 Credits.**

Electromagnetic wave propagation, reflection, refraction, wave guides, cavities antennas and diffraction, tensors, special relativity, the Lorentz group, dynamics of relativistic particles and fields radiation by moving charges, retardation, bremsstrahlung. Additional topics may include

magnetohydrodynamics and plasma physics. Prerequisites: Physics [PHYSICS] 8620 or instructor's consent.

**PHYSICS 8660. Methods in Mathematical Physics. 3 Credits.**

Concentrates on mathematical techniques used in modern physics. Infinite series, functions of a complex variable, differential equations, Fourier series and integral, etc. Prerequisites: Physics [PHYSICS] 4700 or instructor's consent.

**PHYSICS 8680. Thermodynamics and Statistical Mechanics. 3 Credits.**

Thermodynamics as applied in physics, chemistry; laws of distribution; statistical methods of study matter, radiation. Prerequisite: Physics [PHYSICS] 8710 or concurrently.

**PHYSICS 8700. Non-Equilibrium Statistical Mechanics. 3 Credits.**

This course provides an introduction to the theoretical and mathematical description of classical stochastic systems with examples from biophysics and condensed matter physics. Prerequisite: Graduate standing and Physics [PHYSICS] 8680 or consent of instructor.

**PHYSICS 8710. Quantum Mechanics I. 3 Credits.**

Non-relativistic quantum theory in Hilbert space. States and self-adjoint observables, unitary time evolution in various pictures, the path-integral, identical particles, Fock space, angular momentum and some perturbation theory. Prerequisites: Physics [PHYSICS] 8610.

**PHYSICS 8720. Quantum Mechanics II. 3 Credits.**

More perturbation theory, variational methods, semi-classical methods and application to radiation theory, linear response theory and rudiments of relativistic quantum mechanics including the Klein-Gordan equation and the Dirac equation. Prerequisites: Physics [PHYSICS] 8710.

**PHYSICS 8730. Quantum Mechanics III. 3 Credits.**

Properties of many-particle systems at low temperature. General Formalism for Fermi and Bose systems, theory of superconductivity and superfluidity, introduction to quantum spin model--Diagrammatic formulation of quantum electrodynamics. Scattering of electrons and positrons, introduction to radioactive corrections. Prerequisite: Physics [PHYSICS] 8720. Graded on S/U basis only.

**PHYSICS 8801. Topics in Solid State Theory. 3 Credits.**

Selected topics in solid-state theory, including various elementary excitations in solids and their interactions. May be elected more than once. Prerequisite: instructor's consent.

**PHYSICS 8820. Relativity and Gravitation. 3 Credits.**

Special and general theories of relativity. Discussion of accelerated observers and the principles of equivalence. Einstein's gravitational field equations, black holes, gravitational waves and cosmology. Prerequisites: Physics [PHYSICS] 8610, 8620.

**PHYSICS 9090. Research in Physics. 1-99 Credit.**

Research leading to Ph.D. dissertation. Prerequisite: Ph.D. candidacy has been established. Graded on a S/U basis only.

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## Plant Science (PLNT\_S)

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**PLNT\_S 1002. Topics In Plant Science - Biological/Physical/Mathematics. 1-4 Credit.**

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

**PLNT\_S 1010. Plant Science Orientation. 1 Credit.**

Introduction to perspectives, comprehensiveness, and current issues in the plant sciences. Involves independent learning, faculty interviews, and oral and written communication about agronomy, horticulture, entomology, and plant pathology.

**PLNT\_S 1020. World Food and You. 3 Credits.**

(same as F\_S 1020). Basic scientific principles involved in production agriculture, food processing, marketing and consumption. Evaluation and understanding of current agriculture issues that affect human foods and required nutrients.

**PLNT\_S 1125. People, Plants and the Environment. 3 Credits.**

Exploration of the science and niche relationships that exist between people, plants, animals, and the environment. Emphasis placed on urban vs. rural culture, the impact on production agriculture and the world food supply. Prerequisite: restricted to freshmen and sophomores.

**PLNT\_S 2002. Topics in Plant Science - Biological/Physical/Mathematics. 1-4 Credit.**

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

**PLNT\_S 2075. Environmental Horticulture. 3 Credits.**

Investigate interrelationships between plants and the environment. Special emphasis placed on improving homeowners' environmental stewardship and their knowledge of sustainable practices. Graded on A/F basis only.

**PLNT\_S 2100. Introduction to Soils. 3 Credits.**

(same as SOIL 2100). Introduction to soil sciences with emphasis placed on physical, biological, and chemical properties and application to land use, plant growth and environmental problems. Prerequisites: 3 hrs of Chemistry.

**PLNT\_S 2110. Plant Growth and Culture. 3 Credits.**

Principles of plant growth with emphasis on anatomy, morphology, physiology, and environmental factors. Culture of major crop and horticultural species.

**PLNT\_S 2125. Plant Structure and Function. 3 Credits.**

Introduction to plant structures and how they function to promote plant growth and development, using botany, soils, chemistry and biochemistry to understand how plants make a living. The secret of life on earth is revealed in the study of photosynthesis early in the course. Prerequisites: Biological Sciences [BIO\_SC] 1200; Soil Science [SOIL] 2100; Chemistry [CHEM] 1320.

**PLNT\_S 2150. Plants for Interior Design. 2 Credits.**

Identification, culture and uses of plants adaptable to or capable of becoming acclimated to interior environments.

**PLNT\_S 2195. Grapes and Wines of the World. 3 Credits.**

(same as F\_S 2195). Explores the world of wine through study of viticultural principles and practices, wine styles, classifying wine, the winemaking process and New World and Old World wine regions. Learn wine tasting skills and experience wines from around the world. World wine consumption, social and physical health benefits of moderate wine consumption.

**PLNT\_S 2210. Ornamental Woody Plants. 3 Credits.**

Identifies and evaluates trees and shrubs for landscape use. Prerequisite: Biological Science [BIO\_SC] 1010 and 1200.

**PLNT\_S 2215. Ornamental Herbaceous Plants. 3 Credits.**

Annuals, biennials, perennials, ground covers, and bulbs; their identification, nomenclature classification, culture and use. Prerequisite: BIO\_SC 1010, BIO\_SC 1500, or BIO\_SC 1200.

**PLNT\_S 2220. Floral Design I. 2 Credits.**

Use of flowers and plant materials to create basic floral designs. Students will learn to identify floral material, use tools properly and post harvest care of flowers. Focus on the elements and principles of design. Students take home all designs. Restricted to students with less than 75 credits during early registration. Graded on A/F basis only.

**PLNT\_S 2254. Landscape Design. 3 Credits.**

Historical overview of the human and environmental relationships with respect to design on the land. Prerequisite: sophomore standing.

**PLNT\_S 2710. Insects in the Environment. 3 Credits.**

Ways in which insects are adapted for life in particular environments, basics of morphology, taxonomy; how important insect pests affect food and crop production, and principles of control.

**PLNT\_S 3002. Topics in Plant Science - Biological/Physical/Mathematics. 1-4 Credit.**

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

**PLNT\_S 3130. Undergraduate Seminar in Plant Science. 1 Credit.**

Discussion of assigned or selected topics in Plant Science. Prerequisite: sophomore standing or above.

**PLNT\_S 3210. Principles of Weed Science. 4 Credits.**

Introduction to principles of weed growth, reproduction, and impact on human activities. Discussion of weed control techniques and technology, weed identification, and developing weed management strategies. Prerequisite: PLNT\_S 2110 or BIO\_SC 1200.

**PLNT\_S 3213. Genetics of Agricultural Plants and Animals. 3 Credits.**

(same as AN\_SCI 3213). Concepts of molecular, transmission, and population and quantitative genetics. Special emphasis given to breeding and biotechnological applications in plant and animal agriculture. Prerequisites: BIO\_SC 1010, BIO\_SC 1020, BIO\_SC 1500, MATH 1100.

**PLNT\_S 3220. Floral Design II. 2 Credits.**

Continuation of Plant Science [PLNT\_S] 2220. Expansion of skills from introductory floral design. Floral designs created will include larger and more specialized arrangements. Pricing and planning will also be introduced. Prerequisites: PLNT\_S 2220 with grade of B or above.

**PLNT\_S 3225. Plant Breeding and Genetics. 3 Credits.**

Mendelian genetic principles and related genetic developments applicable in plant breeding. Discussion of established and new plant breeding procedures applicable to cultivar development. Prerequisite: Plant Science [PLNT\_S] 2110 or equivalent.

**PLNT\_S 3230. Plant Propagation. 3 Credits.**

Principles and practices of propagation of horticultural plants. Prerequisites: BIO\_SC 1010 and 1200.

**PLNT\_S 3240. Principles of Viticulture I. 4 Credits.**

(same as F\_S 3240). Grapevine growth, development, selection, propagation, training systems pruning, and harvesting; vineyard site selection, design, and development. Graded on A/F basis only. Prerequisites: F\_S 1010 and F\_S 2195/PLNT\_S 2195 or PLNT\_S 2100 or PLNT\_S 2110 or PLNT\_S 2125.

**PLNT\_S 3250. Green Industry Bidding. 1 Credit.**

Familiarize the students with the windfalls and pitfalls of competitive bidding within the green industry. We will look closely at all the visible and invisible costs of managing a green related business and then apply these costs to the bidding process. Graded on A/F basis only. Prerequisites: Plant Science major or instructor's consent; sophomore standing.

**PLNT\_S 3252. Arboriculture and Pruning. 1 Credit.**

Gain an understanding of the concepts and skills associated with establishment and management of urban trees. Emphasis on cultural practices such as planting, fertilization, pruning, chlorosis, oak wilt, and hazard assessment. Examination of the components of a municipal trees ordinance. Prerequisite: Plant Science [PLNT\_S] 2210 or instructor's consent.

**PLNT\_S 3260. Greenhouse Management. 4 Credits.**

Greenhouse design, environmental control and equipment. Practices associated with plant nutrition management, greenhouse pest control, postproduction handling and marketing of greenhouse crops, and greenhouse management are also covered.

**PLNT\_S 3270. Forage Crops. 3 Credits.**

Principle forage crops, pasture production, forage preservation and utilization. Prerequisite: Plant Science [PLNT\_S] 2110.

**PLNT\_S 3275. Grain Crops. 3 Credits.**

Lecture and discussion covering production and utilization, plus growth and development of a wide range of grain crops, including Missouri crops. Problem solving tasks include agronomics, economics and environmental factors. Prerequisite: Plant Science [PLNT\_S] 2110.

**PLNT\_S 3355. Introductory Turfgrass Management. 3 Credits.**

Characteristics of turf materials, principles of establishment and maintenance. Prerequisites: PLNT\_S 2100 or instructor's consent.

**PLNT\_S 3385. Problems in Plant Science. 1-4 Credit.**

Not accepted as a substitute for any regularly scheduled course. Problems arranged with individual faculty member in specific matter area. Prerequisite: consent required.

**PLNT\_S 3500. Forest Pathology. 3 Credits.**

Provides basic understanding of biotic and abiotic agents which cause forest diseases, and current approaches to disease control. Prerequisite: 5 hours Biological Sciences or equivalent.

**PLNT\_S 3510. Biology of Fungi. 3 Credits.**

(same as BIO\_SC 3510). The diverse roles of fungi in the biosphere will be explored by considering fungi we eat, fungi which destroy our food, fungi in folklore and fungi as global nutrient recyclers. Prerequisites: BIO\_SC 1500, BIO\_SC 1100, or BIO\_SC 1200 or equivalent.

**PLNT\_S 3710. Introductory Entomology. 3 Credits.**

(same as BIO\_SC 3710). Holistic biology of insects, including anatomy, physiology, behavior ecology, and management. Prerequisites: BIO\_SC 1010, BIO\_SC 1020, or BIO\_SC 1500, or equivalent.

**PLNT\_S 3715. Insect Diversity. 2 Credits.**

(same as BIO\_SC 3715). Laboratory emphasizing external insect anatomy, classification, and identification to the family level. Insect collection is required. Prerequisite: concurrent enrollment or previous satisfactory completion of PLNT\_S 3710/BIO\_SC 3710.

**PLNT\_S 4002. Topics in Plant Science - Biological/Physical/Mathematics. 1-4 Credit.**

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise.

**PLNT\_S 4313. Soil Fertility and Plant Nutrition. 3 Credits.**

(same as Soil Science [SOIL] 4313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments. Prerequisites: SOIL 2100 or instructor's consent.

**PLNT\_S 4314. Soil Fertility and Plant Nutrition Laboratory. 2 Credits.**

(same as SOIL 4314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants. Prerequisite: concurrent enrollment or previous completion of SOIL 4313.

**PLNT\_S 4315. Crop Physiology. 3 Credits.**

Basic course on crop growth and development. Emphasis is on physiological processes and morphology of crop plants, and their application to crop breeding and management decisions. Prerequisites: Plant Science [PLNT\_S] 2110 or equivalent.

**PLNT\_S 4320. Plant Physiology. 3-5 Credit.**

(same as BIO\_SC 4320). Modern physiology of higher plants using common cultivated plants as examples. May be taken with or without laboratory. Prerequisite: BIO\_SC 1500 or BIO\_SC 1200 and five hours of chemistry.

**PLNT\_S 4325. Field Crop Breeding. 3 Credits.**

Will introduce students to the application of genetics and the plant sciences to the breeding and improvement of self-pollinated field crops. Classical, current and innovative plant breeding techniques will be addressed. Prerequisite: PLNT\_S 2110 and PLNT\_S 3225.

**PLNT\_S 4330. Plant Breeding Theory. 3 Credits.**

Designed to provide a logical application of genetic concepts to mating and selection theory in general improvement of cross pollinated crops. Prerequisite: PLNT\_S 3225 or equivalent.

**PLNT\_S 4340. Principles of Viticulture II. 4 Credits.**

(same as F\_S 4340). Environmental and biological factors influencing vine physiology and winegrape quality. Irrigation, canopy management, pest and disease control, budgets and current trends in viticulture. Graded on A/F basis only. Prerequisite: F\_S 3240/PLNT\_S 3240.

**PLNT\_S 4350. Nursery Crop Production and Management. 4 Credits.**

Operations, methods used by wholesale, retail, landscape nurseries. Field problems, observational trips. Prerequisites: PLNT\_S 3230 and PLNT\_S 3235.

**PLNT\_S 4355. Advanced Turfgrass Management. 3 Credits.**

Provides turfgrass majors a more informative and applicable look at mathematics of turfgrass management, application techniques, cultural practices, and soil/water relationships applicable to careers in golf course and sports turf management, lawn care, and professional grounds maintenance. Prerequisites: PLNT\_S 3355 or instructor's consent.

**PLNT\_S 4360. Precision Agriculture Science and Technology. 3 Credits.**

(same as AG\_S\_M4360 and SOIL 3460). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating

decisions and management. Prerequisites: SOIL 2100, PLNT\_S 2110 or instructor's consent.

**PLNT\_S 4365. Greenhouse Crops Production. 4 Credits.**

Production management decision and commercial culture of the major floriculture crops. Prerequisite: PLNT\_S 3260 or instructor's consent.

**PLNT\_S 4385. Problems in Plant Science. 3 Credits.**

Special problem in plant pathology designed for the minor program in Plant Pathology. Problems arranged on an individual student basis.

**PLNT\_S 4400. Plant Anatomy. 4 Credits.**

(same as BIO\_SC 4400). Comparative structure, growth of meristems; development, structure of important cell types, tissues systems; comparative anatomy of stem, root, leaf. Emphasizes anatomy of gymnosperms, angiosperms. Includes lab. Prerequisites: BIO\_SC 1200 or equivalent. Graded on A/F basis only.

**PLNT\_S 4500. Biology and Pathogenesis of Plant-Associated Microbes. 4 Credits.**

The lecture and lab will provide information on disease development in plant populations and possible control strategies combined with training in retrieving and critically reviewing research information. Prerequisites: 5 hours Biological Sciences, junior, senior or graduate standing.

**PLNT\_S 4520. Environmental Microbiology. 3 Credits.**

Fundamental knowledge of selected microbial processes that are important in agriculture, environmental detoxification, and microbial biotechnology. Emphasis is on molecular, genetic and physiological aspects of nitrogen metabolism, bioconversions, antibiosis and biocontrol.

**PLNT\_S 4710. Systematic Entomology. 5 Credits.**

Taxonomy of insects: emphasizes biology and classification of orders and major families. Insect collection required. Prerequisites: PLNT\_S 3710 and PLNT\_S 3715 or 10 hours biological sciences.

**PLNT\_S 4720. Aquatic Entomology. 3 Credits.**

Identification, life histories, ecology of aquatic arthropods; emphasizes fresh-water insects. For students of wildlife, fisheries management, aquatic biology, advanced entomology. Prerequisites: PLNT\_S 3710, PLNT\_S 3715 and PLNT\_S 4304 or equivalent.

**PLNT\_S 4730. Insect Pest Management for Plant Protection. 3 Credits.**

History and concepts of Integrated Pest Management of insect pests, emphasizing complementary use of biological control, plant resistance, environmental manipulations, genetic manipulations, and selective use of insecticides. Prerequisites: PLNT\_S 3710 and PLNT\_S 3715.

**PLNT\_S 4940. Internship in Plant Science. 1-3 Credit.**

Combines study, observation, and employment with an industry or government agency in area of agronomy or horticulture. Written and oral reports and faculty evaluation. Prerequisites: 60 hours including two courses in department and instructor's consent.

**PLNT\_S 4950. Undergraduate Research in Plant Science. 1-3 Credit.**

Capstone experience consisting of investigations in Plant Science in support of an undergraduate thesis or special project portfolio. Prerequisites: senior standing in Plant Science Degree Program.

**PLNT\_S 4965. Special Readings in Plant Pathology. 1-99 Credit.**

Independent readings and discussions of topics in entomology selected in consultation with supervising faculty member. Paper required.

**PLNT\_S 4975. Advanced Landscape Design. 4 Credits.**

Development of project presentation techniques by analysis of the social, cultural, historical and ecological aspects of landscape design. Prerequisites: PLNT\_S 2254, instructor's consent.

**PLNT\_S 7001. Topics. 1-4 Credit.**

Initial offering of a course(s) in a specific subject matter area. Offered when proposed by a faculty member in that area of expertise. Prerequisite: graduate standing.

**PLNT\_S 7085. Problems. 1-3 Credit.**

Advanced studies not expected to terminate in thesis. Problems arranged with individual faculty member in specific matter area. Prerequisite: instructor's consent.

**PLNT\_S 7087. Seminar. 1 Credit.**

In-depth development of advanced aspects of plant, insect, or microbial sciences through reviews of results of research in progress and current scientific publications. Graded on S/U basis only.

**PLNT\_S 7090. Nonthesis Research. 1-9 Credit.**

Original investigation not leading to preparation of thesis.

**PLNT\_S 7313. Soil Fertility and Plant Nutrition. 3 Credits.**

(same as SOIL 7313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments. Prerequisites: Graduate standing and SOIL 2110 or instructor's consent.

**PLNT\_S 7314. Soil Fertility and Plant Nutrition Laboratory. 2 Credits.**

(same as SOIL 7314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants. Prerequisite: graduate standing concurrent enrollment or previous completion of SOIL 4313/7313.

**PLNT\_S 7315. Crop Physiology. 3 Credits.**

Basic course on crop growth and development. Emphasis is on physiological processes and morphology of crop plants, and their application to crop breeding and management decisions. Prerequisites: PLNT\_S 2125 or equivalent.

**PLNT\_S 7320. Plant Physiology. 3-5 Credit.**

(same as BIO\_SC 7320). Modern physiology of higher plants using common cultivated plants as examples. May be taken with or without laboratory. Prerequisite: graduate standing and BIO\_SC 1500 or BIO\_SC 1200 and five hours of chemistry.

**PLNT\_S 7325. Field Crop Breeding. 3 Credits.**

Will introduce students to the application of genetics and the plant sciences to the breeding and improvement of self-pollinated field crops. Classical, current and innovative plant breeding techniques will be addressed. Prerequisite: graduate standing and PLNT\_S 2110 and PLNT\_S 3225.

**PLNT\_S 7330. Plant Breeding Theory. 3 Credits.**

Designed to provide a logical application of genetic concepts to mating and selection theory in general improvement of cross pollinated crops. Prerequisite: graduate standing and PLNT\_S 3225 or equivalent.

**PLNT\_S 7350. Readings. 1-3 Credit.**

Individual study of assigned topics. Prerequisite: instructor's consent.

**PLNT\_S 7355. Advanced Turfgrass Management. 3 Credits.**

Provides turfgrass majors a more informative and applicable look at mathematics of turfgrass management, application techniques, cultural practices, and soil/water relationships applicable to careers in golf course and sports turf management, lawn care, and professional grounds

maintenance. Prerequisites: PLNT\_S 3355 or instructor's consent. Graded on A/F basis only.

**PLNT\_S 7360. Precision Agriculture Science and Technology. 3 Credits.**

(same as AG\_S\_M 7360 and SOIL 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management. Prerequisites: graduate standing and SOIL 2100, PLNT\_S 2110 or instructor's consent.

**PLNT\_S 7365. Greenhouse Crops Production. 4 Credits.**

Production management decision and commercial culture of the major floriculture crops. Prerequisite: graduate standing and PLNT\_S 3260 or instructor's consent.

**PLNT\_S 7370. Small Fruit and Vegetable Production. 3 Credits.**

Emphasizes production, management and marketing practices for small fruit and vegetable crops. Prerequisites: graduate standing and PLNT\_S 2100, PLNT\_S 3230, and PLNT\_S 3235.

**PLNT\_S 7400. Plant Anatomy. 4 Credits.**

(same as BIO\_SC 7400). Comparative structure, growth of meristems; development, structure of important cell types, tissue systems; comparative anatomy of stem, root, leaf. Emphasized anatomy of gymnosperms, angiosperms. Includes lab. Prerequisites: BIO\_SC 1200 or equivalent. Graded on A/F basis only.

**PLNT\_S 7500. Biology and Pathogenesis of Plant-Associated Microbes. 4 Credits.**

Diagnosis of disease of plants caused by fungi, nematodes, viruses and bacteria. Environmental and genetic factors leading to disease development and strategies for disease management, including biotechnology. Prerequisite: 5 hours BIO\_SC.

**PLNT\_S 7710. Systematic Entomology. 5 Credits.**

Taxonomy of insects: emphasizes biology and classification of orders and suborders in lecture, and major families in lab. Insect collection required. Prerequisites: PLNT\_S 3710 and PLNT\_S 3715 or 10 hours Biological Sciences.

**PLNT\_S 7720. Aquatic Entomology. 3 Credits.**

Identification, life histories, ecology of aquatic insects. Grading is based on lecture, lab, and a collection. For students of wildlife, fisheries management, aquatic biology, advanced entomology. Prerequisites: PLNT\_S 3710, PLNT\_S 3715 or equivalent or instructor's consent.

**PLNT\_S 7730. Insect Pest Management for Plant Protection. 3 Credits.**

History and concepts of Integrated Pest Management for insects pests, emphasizing complementary use of biological control, plant resistance, environmental manipulations, genetic manipulations, and selective use of insecticides. Prerequisites: PLNT\_S 3710 and PLNT\_S 3715.

**PLNT\_S 7820. Principles of Insect Physiology. 4 Credits.**

Major concepts of insect physiology emphasizing functions of organ-systems sensory physiology hormones in development, nutrition. Prerequisites: graduate standing PLNT\_S 3710, PLNT\_S 3715 and PLNT\_S 7810 or equivalent.

**PLNT\_S 7965. Readings in Plant Stress Biology. 1-9 Credit.**

Independent readings and discussion of recent research publications. Topics selected in consultation with supervisory faculty member. Prerequisite: instructor's consent.

**PLNT\_S 7970. Readings in Molecular Ecology of Herbivory. 1 Credit.**

The application of molecular biology tools to the rich history of chemical, physiological, population, and multi-trophic ecology studies on plant herbivore interactions has made for an exciting, fast-paced field at the forefront of ecology, 'functional biology' and 'systems biology'. Prerequisites: instructor's consent; graduate standing.

**PLNT\_S 7975. Advanced Landscape Design. 4 Credits.**

Development of project presentation techniques by analysis of the social, cultural, historical and ecological aspects of landscape design. Prerequisites: graduate standing and PLNT\_S 2254, instructor's consent.

**PLNT\_S 8001. Topics. 1-4 Credit.**

Instruction in specific subject matter areas in plant, insect or microbial sciences. Prerequisite: graduate standing and instructor's consent.

**PLNT\_S 8010. Professionalism and Ethics. 2 Credits.**

Ethical issues in the conduct of scientific research including data integrity, plagiarism, and intellectual property. Scientific writing, lab management, peer review and other professional skills for the life sciences. Prerequisite: graduate standing. Graded on A/F basis only.

**PLNT\_S 8090. Thesis Research. 1-10 Credit.**

Original investigations in plant, insect or microbial science in support of thesis for master's candidates. Graded on S/U basis only.

**PLNT\_S 8330. Molecular Breeding. 3 Credits.**

Development of Molecular Breeding, Evolution of Transgenics, Transformation and Gene Transfer Methods, Transgenics in the Food Supply Genetics and Marker Technology, Genotyping Methods for Marker Assisted Selection (MAS, and Emerging Transgenic and Genotyping Technologies. Graded on A/F basis only. Prerequisites: Plant Science [PLNT\_S] 3225.

**PLNT\_S 8362. Introduction to Plant Metabolism. 2 Credits.**

(same as BIO\_SC 8362 and BIOCHM 8362). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant metabolism. Graded on A/F basis only.

**PLNT\_S 8365. Introduction to Molecular Cell Biology. 2 Credits.**

(same as BIOCHM 8365 and BIO\_SC 8365). This course is part of a series that aims to provide a solid conceptual foundation in interdisciplinary plant biology for graduate students with a research emphasis on plant biology. This course examines the basic concepts and techniques used to understand molecular cell biology. Graded on A/F basis only.

**PLNT\_S 8410. Advanced Weed Science. 3 Credits.**

Discussion of herbicide physiology and fate in the environment, current development in weed science theory and methodology, and application of analytical procedures in weed research. Prerequisite: PLNT\_S 3210 and graduate standing.

**PLNT\_S 8420. Herbicide Mode of Action and Symptomology. 2 Credits.**

Designed for graduate students to gain an understanding of the in-depth processes by which herbicides interrupt normal plant growth and development at a tissue, cellular, and enzymatic level while learning to diagnose visual symptoms associated with herbicide injury. Prerequisites: PLNT\_S 3210; instructor's consent. Course maybe repeated for credit. Graded on A/F basis only.

**PLNT\_S 8505. Introduction to Plant Stress Biology. 2 Credits.**

(same as BIO\_SC 8505) This course is part of a series that aims to provide a solid conceptual foundation to interdisciplinary plant biology for graduate students with a research emphasis in plant biology. This course examines the basic concepts and techniques used to understand plant stress biology. Graded on A/F basis only.

**PLNT\_S 8530. Research with Plant Stress Agents. 3 Credits.**

Students will learn key research strategies for abiotic and biotic plant stress agents. Students will complete two focused hands-on projects. Prerequisites: PLNT\_S 7500 and PLNT\_S 7510 or PLNT\_S 7315, or PLNT\_S 7320, or equivalent. Graduate standing required. Graded A/F only.

**PLNT\_S 8650. Ecological and Evolutionary Genomics. 2 Credits.**

(same as BIO\_SC 8650). This course is designed to give a background in evolution and then explore an exciting new field: Ecological and evolutionary genomics. We will study genes that affect fitness and how whole genomes evolve. Graded on A/F basis only.

**PLNT\_S 8720. Insect Behavior. 3 Credits.**

An examination of the breadth of behaviors found in insects, such as orientation mechanisms, communication, dispersal and migration, defensive mechanisms, lost location, feeding strategies, pollination, courtship and reproduction, and social behavior. Prerequisites: PLNT\_S 3710 and PLNT\_S 3715 or 10 hours of Biological Sciences.

**PLNT\_S 9001. Topics. 1-4 Credit.**

Instruction in specific subject matter areas in plant, insect or microbial sciences. Prerequisites: graduate standing and instructor's consent.

**PLNT\_S 9087. Seminar in Plant Science. 1 Credit.**

In-depth development of advanced aspects of plant, insect and microbial sciences through reviews of results of research in progress and current scientific publications. Graded on A/F or S/U basis dependent on section.

**PLNT\_S 9090. Dissertation Research. 1-10 Credit.**

Original investigations in plant, insect or microbial science in support of dissertation for doctoral candidates. Graded on a S/U basis only.

**PLNT\_S 9310. Ecology of Grazing Lands Systems. 3 Credits.**

Students travel to grazing lands ecosystems to learn: the components and function of grazing lands; research techniques in soil-plant-animal research; forage-livestock ecology; and the role of forages in conservation practices, wildlife habitat, and sustainable agriculture. Prerequisite: instructor's consent.

**PLNT\_S 9415. Advanced Plant Physiology. 1-3 Credit.**

Advanced course in the physiology of plant growth and development. Discussion of current and classical studies in plant physiology with emphasis on responses to environmental variation. Prerequisite: PLNT\_S 4315 or PLNT\_S 4320 or equivalent. Instructor consent required.

**PLNT\_S 9420. Transport and Metabolism of Plant Nutrients. 3 Credits.**

Current and classical concepts in (1) transport of nutrients across plant root membranes and translocation of nutrients in the plant, (2) metabolism and function of plant nutrients and (3) stress caused by mineral imbalances and/or pathogens. Prerequisites: PLNT\_S 4315 or PLNT\_S 4320, and PLNT\_S 4313, and BIOCHM 4270 or equivalent.

**PLNT\_S 9425. Advanced Plant Breeding. 3 Credits.**

Will explore theoretical and applied topics in plant breeding through an examination of classical and current literature. The course will integrate conventional breeding concepts and methodology with current

biotechnical approaches to plant improvement. Prerequisite: PLNT\_S 3225, PLNT\_S 4325, PLNT\_S 4330 and STAT 4530.

**PLNT\_S 9440. Applied Quantitative and Statistical Genetics. 3 Credits.**

Estimation of genetic effects using means and variances, diallel analysis, environmental stability responses, index selection, and gain from selection. Prerequisite: PLNT\_S 4330, STAT 4510, STAT 4530, AN\_SCI 9423, or equivalent.

**PLNT\_S 9470. Genome Sciences. 3 Credits.**

This course examines the concepts and techniques used to understand an organism's genome at the structural and functional level. Microbial, mammalian, and plant species are represented. Genomics is a rapidly evolving field and the aim is to present the most current perspective in understanding structural and functional aspects. Students are expected to apply critical thinking skills in problem solving, literature reviews, and in class discussions. Graded on A/F basis only. Prerequisites: BIO\_SC 2200 or PLNT\_S 3213 or PLNT\_S 3225.

**PLNT\_S 9540. Genetics of Plant-Microorganism Interaction. 3 Credits.**

Molecular and general genetics of the interactions between plants and pathogenic or symbiotic microorganisms. Prerequisites: PLNT\_S 7500 and PLNT\_S 7510, one course each in Biochemistry and Genetics.

**PLNT\_S 9810. Insect Ecology. 3 Credits.**

Ecological aspects of insect populations and communities including population dynamics, predator-prey interactions, competition, diversity and stability. Quantitative methods are emphasized. Prerequisites: PLNT\_S 3710 and PLNT\_S 3715, STAT 1400 and BIO\_SC 3650 or instructor's consent.

## Political Science (POL\_SC)

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**POL\_SC 1004. Topics in Political Science - Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester.

**POL\_SC 1100. American Government. 3 Credits.**

Topics covered include Constitution, federalism, civil liberties, political attitudes, interest groups, political parties, nominations, elections, and campaigns, voting behavior, Congress, Presidency, bureaucracy, and judiciary. Meets state law requirement.

**POL\_SC 1100H. American Government - Honors. 3 Credits.**

Topics covered include Constitution, federalism, civil liberties, political attitudes, interest groups, political parties, nominations, elections, and campaigns, voting behavior, Congress, Presidency, bureaucracy, and judiciary. Meets state law requirement. Honors eligibility required.

**POL\_SC 1400. International Relations. 3 Credits.**

Contemporary international affairs including family of nations, control of national foreign policies, competition and cooperation in legal, political, economic, social fields.

**POL\_SC 1400H. International Relations - Honors. 3 Credits.**

Contemporary international affairs including family of nations, control of national foreign policies, competition and cooperation in legal, political, economic, social fields. Honors eligibility required.

**POL\_SC 2004. Topics in Political Science - Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: departmental consent for repetition.

**POL\_SC 2100. State Government. 3 Credits.**

Government and politics at the state level, with emphasis on Missouri. Meets state law constitutional requirement.

**POL\_SC 2200. The Judicial Process. 3 Credits.**

Analysis of roles played by American judges and courts in democratic policy formation.

**POL\_SC 2600. Canadian Politics and Government. 3 Credits.**

Introductory survey of Canada, including constitutional development, governmental institutions, political participation, and Canadians' political attitudes and behaviors. Prerequisite: sophomore standing.

**POL\_SC 2700. Comparative Political Systems. 3 Credits.**

Analysis of major political systems selected from Europe, Asia, Africa, and Latin America, emphasizing basic concepts of comparative political study. Prerequisites: Political Science [POL\_SC] 1100.

**POL\_SC 2700H. Comparative Political Systems - Honors. 3 Credits.**

Analysis of major political systems selected from Europe, Asia, Africa, and Latin America, emphasizing basic concepts of comparative political study. Prerequisites: Political Science [POL\_SC] 1100. Honors eligibility required.

**POL\_SC 2720. European Democracies. 3 Credits.**

This course provides an introduction to the institutions and issues in contemporary European political systems. It covers domestic institutions and policies as well as the developments of the European Union. Prerequisites: sophomore standing.

**POL\_SC 2800. Introduction to Political Theory. 3 Credits.**

Selected great political theorists and their contemporary relevance. How to think critically about political ideas and ideologies. Prerequisite: sophomore standing.

**POL\_SC 2860. American Political Thought. 3 Credits.**

Examines major themes that shaped three centuries of American political thought, including slavery, religion, and the tension between unity and difference. Readings are drawn from primary sources (Jefferson, Adams, Mason, Tocqueville, Calhoun, Lincoln, Stowe, Baldwin) as well as contemporary analytic commentary on those sources (Bercovitch, Hartz, Wolin, Guinier, Morrison). Prerequisite: sophomore standing.

**POL\_SC 3000. Introduction to Political Research. 3 Credits.**

This course is an introduction to the systematic analysis of political phenomenon. It examines the meaning of "explanation" and "causal reasoning," and research strategies designed to make valid causal inferences. The course overview experimental design, measurement, hypothesis formulation and testing, and the display of information, using substantive examples from two or more fields of political science for illustrative purposes. Prerequisite: sophomore standing.

**POL\_SC 4000. Introductory Statistics for Political Science. 3 Credits.**

Basic course in applied statistics and inference using extensive examples from voting behavior, congressional behavior, international relations and public policy. Topics included nonparametric measures, probability, and rudimentary hypothesis testing; computer applications with political data using SAS. Prerequisites: Mathematics [MATH] 1100/1120 or equivalent, concurrent enrollment in Political Science [POL\_SC] 4010. Math Reasoning Proficiency Course.

**POL\_SC 4004. Topics in Political Science - Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. Prerequisite: instructor's consent.

**POL\_SC 4010. Computing Methods. 1 Credit.**

Develops computer-based skills with political science data. SAS, and other packages used in mainframe and PC environments. Graded on S/U basis only. Prerequisite: concurrent enrollment in Political Science [POL\_SC] 4000.

**POL\_SC 4030. Formal Political Analysis. 3 Credits.**

Introductory course in formal mathematical models of political behavior and political institutions. Topics includes electoral rules, agenda control, measures of power, collective action, constitutions. Prerequisites: Mathematics [MATH] 1100/1120 or equivalent.

**POL\_SC 4100. Political Parties and Election Campaigns. 3 Credits.**

Development, organization, functions, activities of major and minor political parties; principles and procedures of managing campaigns; campaign finance; election administration. Prerequisites: Political Science [POL\_SC] 3000.

**POL\_SC 4110. Political Behavior. 3 Credits.**

Economic, psychological, and social dimensions of political behavior; participation, leadership and elites; political attitudes; voting behavior and decision-making processes. Prerequisite: Political Science [POL\_SC] 3000.

**POL\_SC 4120. Politics and the Media. 3 Credits.**

The role and importance of mass media in the political process, primarily the U. S. Constitutional protections of the press, politics of media control, political news and advertising, effects of information on election campaigns, political institutions, and policymaking. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4130. African-American Politics. 3 Credits.**

(same as Black Studies [BL\_STU] 4130). Surveys political participation of African-Americans in American politics. Analyzes their public lives in the context of elections, behavior of political organizations, social movements, parties, and level of government. Prerequisites: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4140. Congress and Legislative Policy. 3 Credits.**

Study of national and state legislative systems and legislative policy making, with emphasis on Congress. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4150. The American Presidency. 3 Credits.**

Evolution of the presidency; particular emphasis on constitutional and political roles played by chief executive in shaping public policy. Prerequisites: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4160. Interest Groups. 3 Credits.**

Development, organization, functions, activities, internal politics of special interest groups such as business, labor, agricultural and public interest groups; lobbying and techniques for influencing public policy in the American political system. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4170. Politics of the American South. 3 Credits.**

This course focuses on the politics of the American South in the latter part of the 20th century and the early years of the current millennium. For undergraduate credit only. Prerequisite: Political Science [POL\_SC] 1100, junior standing or instructor's consent.



**POL\_SC 4200. The American Constitution. 3 Credits.**

Leading American constitutional principles as they have evolved through important decisions of the United States Supreme Court. Prerequisites: Political Science [POL\_SC] 1100; junior standing.

**POL\_SC 4210. Constitutional Rights. 3 Credits.**

Survey of Supreme Court cases involving the Constitution's protections for life, liberty, and property and guarantee of equal protection of the law. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4220. The United States Supreme Court. 3 Credits.**

Role of Supreme Court in American system of government; particular attention given to reading biographies and writings of the Justices. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4230. Constitution and Civil Liberties. 3 Credits.**

Civil liberties in the American constitutional context emphasizing freedom of expression (religion, speech, press, assembly), rights of accused and right to privacy. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4310. Comparative State Politics. 3 Credits.**

Analyzes similarities and differences of state politics and the ways in which such politics are shaped by political and socioeconomic environments of the states. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4320. Public Policy. 3 Credits.**

Introduction to the study of public policy in the United States. Analyzes public policy choices at the national, state and local level and the variety of forces which serve to shape policy decisions. Prerequisite: Political Science [POL\_SC] 1100, and junior standing.

**POL\_SC 4370. Issues in Public Bureaucracy. 3 Credits.**

Investigates selected political and administrative problems affecting public bureaucratic units. Context varies. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4380. Politics of Criminal Justice. 3 Credits.**

Course explores the political motivations for and the substantive consequences of state and federal criminal justice policy in the United States. Prerequisite: junior or senior standing.

**POL\_SC 4400. Theories of International Relations. 3 Credits.**

Surveys Theories of International Relations. Analyzes conceptions of decision-making, foreign policy behavior and international society. Prerequisite: junior standing.

**POL\_SC 4410. Politics and War. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4410). Why do wars occur? The functions of force and uses of a threat of force. Problems of national security strategy and arms control. Prerequisite: junior standing.

**POL\_SC 4411. Genocide, Terrorism and Civil War. 3 Credits.**

This course explores the conditions that lead to the initiation, escalation and termination of civil wars as well as the causes and targets of terrorism and the effects of genocide.

**POL\_SC 4412. Strategy and Warfare. 3 Credits.**

Examines strategic theory, traditional forms of warfare (on land, sea, and in the air), as well as irregular warfare and terrorism. Additional topics include weapons of mass destruction, deterrence, and technology. Prerequisite: junior standing or instructor's consent.

**POL\_SC 4415. Peacekeeping and Intervention. 3 Credits.**

This course will survey the causes and consequences of peacekeeping and intervention as well as assess the conditions that lead to successful and failed missions. Prerequisite: junior standing.

**POL\_SC 4420. Politics of International Economic Relations. 3 Credits.**

Study of reciprocal interaction between global politics and economics. Includes politics of north/south relations, multinational non-state actors, arms transfers and dependency. Prerequisites: junior standing.

**POL\_SC 4440. International Organization. 3 Credits.**

Forms and functions of governmental (United Nations, European Union, NATO) and nongovernmental international organizations. Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4500. The European Union in the Global System. 3 Credits.**

Provides an understanding of the European Union from the perspective of international relations and comparative politics. Topics covered pertain to the institutions, politics and policies of the European Union and its member states. Prerequisites: Political Science [POL\_SC] 1100, 1400 and junior standing.

**POL\_SC 4540. American Foreign Policies. 3 Credits.**

Bases, formulation, evaluation of current American foreign policies. Prerequisite: junior standing.

**POL\_SC 4600. Latin American Politics. 3 Credits.**

Development, present status of political institutions in South America; emphasizes current political problems. Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4605. Latin American Politics through Film. 3 Credits.**

This course provides an introduction to Latin American politics using the medium of film to illustrate the complexities of political development, regime change, revolutionary movements, and problems facing new democracies such as crime, poverty, drugs, and democratic stability.

**POL\_SC 4610. European Political Systems. 3 Credits.**

Comparison of political cultures, institutions, and processes of Britain, France, West Germany, and selected smaller countries in Western Europe. Prerequisite: junior standing.

**POL\_SC 4640. African Politics. 3 Credits.**

(same as Black Studies [BL\_STU] 4640). A general comparative course focusing on post-independent Africa. Theories and concepts related to decolonization, nationalism, democratization, and ethnicity; also institutional forms and organizations: political parties, parliaments, and executives. Prerequisite: Political Science [POL\_SC] 1100 and junior standing.

**POL\_SC 4660. Canada in North America. 3 Credits.**

This course focuses on the role of Canada in North America. The main topic areas include the evolution of Canada as a political system; political structures and processes; regionalism and social movements; political, economic and social connections with North America; and the future of Canada in North America. Prerequisite: Political Science [POL\_SC] 2600.

**POL\_SC 4670. The Political System of the European Union. 3 Credits.**

This course examines the politics, political actors, and institutions of the European Union from a comparative perspective. It questions whether we can view the EU as a federal democratic system similar to the U.S. Prerequisites: Political Science [POL\_SC] 1100 and Junior or Senior standing or consent of instructor.

**POL\_SC 4710. Terrorism: Religious, Ethnic and Ideological Politics. 3 Credits.**

Terrorism as political violence extending beyond the acts themselves. Examines major modern movements, e.g. Northern Ireland, Basques (Spain), Germany, Algeria, Arab-Israeli, Iran, India, Sri Lanka, Peru, Argentina, Uruguay. Prerequisite: junior standing.

**POL\_SC 4720. Politics of Development. 3 Credits.**

(same as Black Studies [BL\_STU] 4720). Comparative, interdisciplinary analysis of the politics of developing countries in Asia, Africa, and Latin America. Special attention given to the problems of political and socioeconomic development. Prerequisites: junior standing or instructor's consent.

**POL\_SC 4730. Women and Politics. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4730). This course examines women's political participation and public policies towards women in countries around the world. Prerequisites: Political Science [POL\_SC] 1100; junior standing.

**POL\_SC 4740. Comparative Political Culture. 3 Credits.**

Review of the many divergent conceptions of political culture and examination of the dynamics and consequences for the performance of political systems and the behavior of their citizenry. Comparison of particular cultures of selected regions including East Asia, Europe and the Middle East, Latin America, and North America. Prerequisite: junior standing.

**POL\_SC 4750. Power and Money. 3 Credits.**

This course provides an introduction to comparative political economy by focusing on the following questions. How and why do governments promote economic prosperity? Does democracy make people richer or poorer? Is it true that "money is power"? Can poor countries enjoy a stable democracy? Prerequisite: junior standing.

**POL\_SC 4760. Comparative Political Parties. 3 Credits.**

This course will explore political parties and party systems in democracies around the world. The course will focus on differences in the number, size, ideology, polarization, and functions of political parties. Prerequisites: Political Science [POL\_SC] 2700 and Junior standing or consent of instructor.

**POL\_SC 4770. Comparative Political Behavior. 3 Credits.**

Explores research questions related to cross-national differences and similarities in public opinion formation, political culture and values, voting behavior, and other forms of political participation. Violent forms of political participation are also considered. Prerequisite: Junior Standing and Political Science [POL SC] 1100. Graded on A/F basis only.

**POL\_SC 4800. Classical Political Theory. 3 Credits.**

Great Greek, Roman, and Medieval political theorists on the relation of psychology, ethics, politics, and the best form of government. Prerequisite: junior standing or instructor's consent.

**POL\_SC 4810. Modern Political Theory. 3 Credits.**

Great political theorists from Machiavelli through Marx on the nation state, capitalism, liberalism, conservatism, and Marxism. Prerequisite: junior standing or instructor's consent.

**POL\_SC 4820. Contemporary Political Theory. 3 Credits.**

Great contemporary thinkers on Western vs. Eastern Marxism, existentialism, critical theory, political theologies, postmodernism, feminism, environmentalist ideologies, biological approaches to politics. Prerequisite: junior standing or instructor's consent.

**POL\_SC 4830. Democracy in America (and Elsewhere). 3 Credits.**

This course focuses on the dynamics of democracy. We will explore various topics in the history, development, and practice of democracy through an examination of the writings of Alexis de Tocqueville, one of the most insightful and prescient observers of American political culture. Prerequisites: Political Science [POL\_SC] 1000 and Junior standing.

**POL\_SC 4840. Developing Dynamics of Democracy. 3 Credits.**

This course examines developments in the theory and practice of democracy from the ancient Greeks to the present. Beginning with the origins of democracy in the Hellenic city states, we consider the transformation of democratic concepts in the classical liberal period, review the development of democratic institutions in the United States and Europe, examine the emergence of supra-national democratic institutions such as the European Union, and assess the future of democratization in the 21st century. Prerequisite: POL\_SC 1100.

**POL\_SC 4890. Contemporary Political Analysis. 3 Credits.**

This course introduces public choice writings. Public choice applies economic methods to the study of politics. Topics covered include the appropriate size of the state, how individuals organize to achieve shared goals and how voters chose in elections. Prerequisite: junior standing or instructor's consent.

**POL\_SC 4940. Political Science Internship. 3-6 Credit.**

Work experience in a public or private organization that is relevant to the political science major coordinated by a faculty member. Prerequisites: junior standing with a 3.0 GPA; or senior standing with 2.67 GPA. Must be in good standing.

**POL\_SC 4985. Problems in Political Science. 1-99 Credit.**

Independent investigation to meet needs of the individual student. Prerequisite: instructor's consent.

**POL\_SC 4986. Special Readings in Political Science. 1-99 Credit.**

Independent readings selected in consultation with supervisory faculty member. Prerequisite: instructor's consent.

**POL\_SC 4995. Political Science Capstone. 3 Credits.**

Readings and discussions in selected areas of political science (comparative, American, international affairs, public administration/policy or theory). Subject depends on instructor. Prerequisites: political science major, senior standing.

**POL\_SC 4996. Political Science Capstone, Honors. 1-6 Credit.**

Special readings, reports in the several fields of political science. For political science Honors students. Prerequisite: senior standing. Honors eligibility required.

**POL\_SC 7000. Introductory Statistics for Political Science. 3 Credits.**

Basic course in applied statistics and inference using extensive examples from voting behavior, congressional behavior, international relations and public policy. Topics included nonparametric measures, probability, and rudimentary hypothesis testing; computer applications with political data using SAS. Prerequisites: graduate standing and Mathematics [MATH] 1100/1120 or equivalent, concurrent enrollment in Political Science [POL\_SC] 4010.

**POL\_SC 7010. Computing Methods. 1 Credit.**

Develops computer-based skills with political science data. SAS, and other packages used in mainframe and PC environments. Graded on S/U basis only. Prerequisite: concurrent enrollment in Political Science [POL\_SC] 4000.

**POL\_SC 7085. Problems in Political Science. 1-99 Credit.**

Individual study in one of the fields of Political Science. Prerequisite: graduate standing and instructor's consent.

**POL\_SC 8085. Master Research in Political Science. 1-99 Credit.**

Independent research not leading to a thesis. Graded on S/U basis only. Prerequisite: instructor's consent.

**POL\_SC 8090. Masters Research in Political Science. 1-99 Credit.**

Independent research leading to thesis. Graded on S/U basis only. Prerequisite: graduate standing.

**POL\_SC 9000. Scope and Methods. 3 Credits.**

Examines the major fields in the discipline, assumptions underlying empirical social science and theoretical issues in the study of politics. Primarily for doctoral candidates in political science. Prerequisite: graduate standing.

**POL\_SC 9030. Linear Models in Politics. 3 Credits.**

Linear and non-linear multivariate estimation techniques with applications to political science research. Prerequisite: graduate standing.

**POL\_SC 9040. Advanced Political Methodology. 3 Credits.**

Analytic strategies and statistical models applicable to social science research. Emphasis on modeling political phenomena. Topics vary, include linear and nonlinear models, multidimensional scaling. Prerequisite: graduate standing.

**POL\_SC 9050. Introduction to Formal Political Theory. 3 Credits.**

Formal and mathematical models of political institutions and behavior. Topics may include social choice, game theory, spatial models, coalition formation. Prerequisite: graduate standing.

**POL\_SC 9085. Problems in Political Science. 1-99 Credit.**

For graduate students with necessary prerequisite courses. Topics in one of the fields of political science for individual study. Prerequisite: graduate standing.

**POL\_SC 9090. Ph D Research in Political Science. 1-99 Credit.**

Independent research leading to thesis. Graded on a S/U basis only. Prerequisite: graduate standing.

**POL\_SC 9100. American Political Behavior. 3 Credits.**

Critical examination of literature on political behavior in the United States. Topics include voting and elections, public opinion, parties and interest groups, political psychology, communication, elites, and collective action. Prerequisite: graduate standing.

**POL\_SC 9120. Voting and Elections. 3 Credits.**

Research seminar on political participation, voter choice, campaigns, and elections, primarily in the United States. Covers theories, approaches and research on electoral behavior. Prerequisite: graduate standing.

**POL\_SC 9140. American Political Institutions. 3 Credits.**

Critical examination of literature on political institutions in the United States. Topics include Congress, the Presidency, courts, the bureaucracy, political organizations, federalism, and institutional dynamics. Prerequisite: graduate standing.

**POL\_SC 9150. Political Parties. 3 Credits.**

Research seminar on the organization and activities of political parties, primarily in the United States. Attention to historical development, nature of party change, functions, elites, membership, political finance, and policy formulation. Prerequisite: graduate standing.

**POL\_SC 9160. Interest Groups. 3 Credits.**

Research seminar on nonpartisan organizations seeking to influence the public policy agenda. Includes problems of collective action, mobilization and organization of interest groups, strategies and tactics, lobbying, political movements, theories and research. Prerequisite: graduate standing.

**POL\_SC 9170. Legislative Institutions. 3 Credits.**

Research seminar on the U.S. Congress and legislative institutions generally. Topics include the legislative process, policy change, committees, political parties, leadership, representation, and relations with other branches of government. Prerequisite: graduate standing.

**POL\_SC 9175. Evolution of American Legislatures, 1619 to the Present. 3 Credits.**

Examination of the organizational evolution of American legislatures from the colonial era to the present. Graduate Standing Required.

**POL\_SC 9190. Research in American Politics. 3 Credits.**

Directed research into one or more specific aspects of American Politics, behavior, and institutions. Prerequisite: graduate standing.

**POL\_SC 9220. Constitutional Law: Institutions and Powers. 3 Credits.**

Research seminar on powers and constraints on government found in the U.S. Constitution. Topics include separation of powers, federalism, legislative and presidential power, the commerce clause, taxing and spending. Prerequisite: graduate standing.

**POL\_SC 9230. Public Law. 3 Credits.**

Research seminar on the judicial process in the United States. Prerequisite: graduate standing.

**POL\_SC 9240. Racial and Ethnic Politics. 3 Credits.**

Theories, institutional processes, and behaviors pertaining to social defined racial and ethnic groups. Topics include social dominance, representation, mobilization, public opinion, and the influence of racial and ethnic factors on the American political process. Prerequisite: graduate standing.

**POL\_SC 9300. Federalism and Intergovernmental Relations. 3 Credits.**

Analyzes relationships among American governmental units emphasizing national-state relations and metropolitan area problems. Prerequisite: graduate standing.

**POL\_SC 9310. Public Policy. 3 Credits.**

Covers the basic theory, approaches, problems and issues relating to the scope, development and implementation of public policy. Prerequisite: graduate standing.

**POL\_SC 9320. Administrative Politics. 3 Credits.**

Critical examination of literature relating to selected topics in public bureaucracies. Prerequisite: graduate standing.

**POL\_SC 9330. Research in Policy and Administration. 3 Credits.**

Contemporary research in public policy, bureaucratic politics, public management and administration.

**POL\_SC 9350. Public Policy, Processes and Strategies. 3 Credits.**

Provides an overview of the history, function, size, scope, development, and management of the nonprofit sector. Historical, political, economic, and social perspectives are used to examine the meaning of voluntarism, charity, philanthropy, and the nonprofit sector. Graded on A/F basis.

**POL\_SC 9390. Administration and Public Policy. 3 Credits.**

Directed research in Public Administration or Public Policy. Inquire as to the emphasis for any given semester. Prerequisite: graduate standing.

**POL\_SC 9400. Introduction to International Relations. 3 Credits.**

Analysis, evaluation of some basic theories which attempt to explain international affairs. Prerequisite: graduate standing.

**POL\_SC 9420. Quantitative Approaches in International Relations. 3 Credits.**

Research seminar emphasizing quantitative analysis of large data sets on international politics, especially international conflict. Topics include conflict escalation, correlates of war, deterrence, alliance behavior and the democratic peace. Prerequisite: graduate standing.

**POL\_SC 9430. International Political Economy. 3 Credits.**

Theories of political economy and current problems such as North-South relations, international trade, monetary relations, aid regimes, and international divisions of labor. Prerequisite: graduate standing.

**POL\_SC 9440. Foreign Policy Analysis. 3 Credits.**

Research seminar assessing foreign policy decisions and outcomes with particular attention given to decision-making. Both theoretical and empirical methods for testing foreign policy are considered. Approaches include domestic politics, bureaucratic, and psychological models.

**POL\_SC 9450. International Conflict. 3 Credits.**

This is an advanced seminar in international conflict. The range of material that might be included is vast, so an effort will be made to balance overall coverage with the need to look in more depth at some especially salient areas in the literature. The seminar unfolds in five parts. Prerequisite: graduate standing.

**POL\_SC 9460. Coercive Diplomacy. 3 Credits.**

Research seminar on how nations apply political and economic sanctions on other nations in order to compel or entice changes in foreign policy and/or government behavior. How threats (short of conflict) and incentives govern international relations. Prerequisite: graduate standing.

**POL\_SC 9470. Theories of Civil War. 3 Credits.**

Seminar on why groups may engage in violence against the state or other opposition groups. Topics include causes of civil wars, terrorism as a strategy of violence and possible solutions including third party security, partition, intervention, power sharing and treaty design. Graded on A/F basis only.

**POL\_SC 9480. Human Security. 3 Credits.**

Seminar on cross-national civil, political, economic, social, and cultural rights. The determinants of human security issues and the efficacy and dynamics of efforts from intergovernmental organizations, foreign aid, peacekeeping, interventions, and treaties on human rights.

**POL\_SC 9490. Selected Themes in International Relations. 3 Credits.**

Intensive study of foreign policy formulation and implementation; special emphasis on American foreign policies. Prerequisite: graduate standing.

**POL\_SC 9600. Introduction to Comparative Politics. 3 Credits.**

Study of theories and approaches to comparative politics in Europe, Asia and/or Latin America. Prerequisite: graduate standing.

**POL\_SC 9610. Latin American Politics. 3 Credits.**

Research seminar on politics and government in Central and South America. Topics include modernization and dependency theories, civil-military relations, economics adjustment, democratic transitions, and area and country studies. Prerequisite: graduate standing.

**POL\_SC 9620. Politics of Industrial Societies. 3 Credits.**

Comparative analysis of public policy in Western democracies. Emphasis on economic policy and related policy areas. Comparisons of Western European countries with United States, Japan, Russia when appropriate. Prerequisite: graduate standing.

**POL\_SC 9640. East Asian Politics. 3 Credits.**

Intensive study of selected topics in the internal and external politics of China, Japan and Korea. Prerequisite: graduate standing.

**POL\_SC 9650. African Politics. 3 Credits.**

Research seminar on comparative African politics. Theory and research on sub-Saharan post-independence governance on the African continent. Prerequisite: graduate standing.

**POL\_SC 9670. European Transitions. 3 Credits.**

Research seminar comparing post-communist transitions with those from previous European transformations along economic, political, and social lines. The course focuses on testing theories and on comparing transitional experiences in search of generalizable results. Prerequisite: graduate standing.

**POL\_SC 9680. Politics of Development. 3 Credits.**

Research seminar on the politics of development in the developing world. Examines the relationship between political and economic change in Africa, Asia and Latin America, as well as global patterns. Prerequisite: graduate standing.

**POL\_SC 9700. Democratization. 3 Credits.**

Research seminar on the third wave of democratization. Classical and contemporary conceptions of democracy, measurement, theories, trends, and influences on democratization across the globe. Prerequisite: graduate standing.

**POL\_SC 9710. Comparative Political Economy. 3 Credits.**

Interdisciplinary, comparative analysis of political aspects of political economy, rural development, and related issues. Prerequisite: graduate standing.

**POL\_SC 9720. Comparative Political Institutions. 3 Credits.**

Research seminar on comparative political institutions. Debates in comparative politics on the influence of rules and institutions on political decisions in developed democracies. Topics include political parties, legislatures, governments, and electoral rules. Prerequisite: graduate standing.

**POL\_SC 9760. Comparative Political Parties. 3 Credits.**

This course will analyze cross-national differences in the size and nature of party systems in established democracies. Graded on A/F basis only.

**POL\_SC 9790. Seminar in Comparative Politics. 3 Credits.**

Comparative study of selected aspects of political systems. Variable content. May be repeated for credit. Prerequisite: graduate standing.

**POL\_SC 9901. Topics in Political Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. Prerequisites: graduate standing.

**POL\_SC 9910. Leadership in Civic Education. 3 Credits.**

Intensive workshop for Missouri secondary social studies teachers. Includes instructional materials on U.S. and Missouri governments, lectures by leading scholars, breakout sessions, and interactions with government practitioners. Prerequisite: graduate standing.

**POL\_SC 9970. Independent Readings for Ph.D. Comprehensive Examinations. 1-9 Credit.**

Graded on S/U basis only. Prerequisite: graduate standing.

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## Portuguese (PORT)

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### **PORT 1100. Elementary Portuguese I. 6 Credits.**

Elementary Portuguese I is designed to give students an overview of the grammar and syntax of Portuguese. Emphasis is on oral and listening skills with some reading and writing.

### **PORT 1200. Elementary Portuguese II. 6 Credits.**

Elementary Portuguese II is designed to give students an overview of the grammar and syntax of Portuguese. Emphasis is on oral and listening skills with some reading and writing. Prerequisite: grade of C- or better in Portuguese [PORT] 1100 or its equivalent.

### **PORT 2001. Topics in Portuguese-General. 1-3 Credit.**

Organized study of selected topics. Subject may vary from semester to semester. May be repeated with consent of instructor.

### **PORT 2005. Topics in Portuguese-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subject may vary from semester to semester. May be repeated with consent of instructor.

### **PORT 2160. Intermediate Portuguese. 3 Credits.**

Review of grammar through Brazilian culture. Designed for students who have taken either Portuguese 1200 or Portuguese 4070 and wish to continue studying the language. Prerequisite: Portuguese [PORT]1200 OR 4070.

### **PORT 2310. Brazilian Civilization. 3 Credits.**

Survey of Brazilian history, arts and culture. Open to any student interested. No knowledge of Portuguese required. Prerequisite: sophomore standing.

### **PORT 3001. Topics in Portuguese-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition.

### **PORT 3005. Topics in Portuguese-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: sophomore standing, departmental consent for repetition.

### **PORT 3160. Advanced Portuguese Composition and Conversation. 3 Credits.**

Development of more sophisticated skills of written and oral expression. Prerequisite: Portuguese [PORT] 2160.

### **PORT 3420. Survey of Brazilian Literature. 3 Credits.**

Masterpieces of Brazilian literature in translation from its origins to present. Prerequisites: sophomore standing.

### **PORT 3875. Brazilian Cinema. 3 Credits.**

(same as Film Studies [FILM\_S] 3875). An introduction to Brazilian cinema, culture and society through the study of contemporary cinematic productions. Topics include: Hollywood perceptions of Brazil; re-definitions of national identity and history, representations of race and gender. Prerequisite: English [ENGLISH] 1000.

### **PORT 4070. Intensive Beginning Portuguese. 3 Credits.**

Designed for rapid acquisition of a reading knowledge of Portuguese. Cannot be taken to fulfill undergraduate language requirement. Prerequisites: instructor's consent.

### **PORT 4960. Special Readings in Portuguese. 1-3 Credit.**

Independent study through readings, conferences, reports. Prerequisite: departmental consent.

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## Psychiatry (PSCHTY)

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### **PSCHTY 6005. Psychiatry Clerkship. 4-7 Credit.**

Psychiatry Clerkship.

### **PSCHTY 6015. Rural Psychiatry Clerkship. 4 Credits.**

Rural Psychiatry Clerkship.

### **PSCHTY 6105. Remediation 6005 Psychiatry Clerkship. 4 Credits.**

Psychiatry Clerkship Remediation. Prerequisite: 6005 Psychiatry Clerkship, received unsatisfactory grade.

### **PSCHTY 6363. ABS Psychiatry Research. 5-10 Credit.**

ABS Psychiatry Research.

### **PSCHTY 6365. ABS Psychiatry Research and Review. 5-10 Credit.**

ABS Psychiatry Research and Review.

### **PSCHTY 6367. ABS Psychopharmacology. 5-10 Credit.**

ABS Psychopharmacology.

### **PSCHTY 6630. Narrative Med and the Meaningful Life. 5 Credits.**

The 4th year medical student will attend didactics and participate in discussions. They will complete suggested readings (short stories, poems and essays), assessments and writing assignments/projects. Prerequisites: 4th year medical student, all core clerkships. May be repeated for credit.

### **PSCHTY 6730. Adult Outpatient Psychology - Rural. 3 Credits.**

Adult Outpatient Psychology - Rural.

### **PSCHTY 6731. Psychiatry Rural Elective. 5 Credits.**

The 4th year medical student will participate in the evaluation of adult psychiatric patients and child psychiatric patients in a clinical setting. Prerequisite: Psychiatry [PSCHTY] 6005; restricted to 4th year medical students.

### **PSCHTY 6835. Psychiatry Outpatient Clinic. 5 Credits.**

Psychiatry Outpatient Clinic.

### **PSCHTY 6836. Psychiatry Adult Inpatient Service. 5 Credits.**

Psychiatry Adult Inpatient Service.

### **PSCHTY 6837. Psychosomatic Medicine. 5 Credits.**

Psychosomatic Medicine.

### **PSCHTY 6838. Forensic Psychiatry. 5 Credits.**

Forensic Psychiatry.

### **PSCHTY 6839. Child/Adolescent Psychiatry. 5 Credits.**

Child/Adolescent Psychiatry.

### **PSCHTY 6840. Geriatric Psychiatry. 5 Credits.**

Geriatric Psychiatry.

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## Psychology (PSYCH)

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### **PSYCH 1000. General Psychology. 3 Credits.**

Survey of theories, principles, and methods in the study of human behavior.

**PSYCH 1000H. General Psychology - Honors. 3 Credits.**

Survey of theories, principles, and methods in the study of human behavior. Honors eligibility required.

**PSYCH 1001. Topics in Psychology - General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topics and earnable credit may vary by semester. This course may not be used toward behavioral science distribution credit. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000.

**PSYCH 1003. Topics in Psychology - Behavioral Science. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course carries behavioral science distribution credit for non-psychology majors. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000 and instructor's consent.

**PSYCH 1003H. Topics in Psychology - Honors - Behavioral Science. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course carries behavioral science distribution credit for non-psychology majors. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000. Honors eligibility required. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 1020. Applied Psychology. 3 Credits.**

Surveys wide range of applications of psychology. Topics include social issues (prejudice and violence), applications to fields such as business and law, applications for personal improvement (improving memory), and others (sports, health, environment). Prerequisite: Psychology [PSYCH] 1000.

**PSYCH 1030. Orientation to the Psychology Major. 1 Credit.**

This course is intended to help students choose the best major for themselves and to provide information on careers available to psychology majors.

**PSYCH 2001. Topics in Psychology-General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course may not be used toward behavioral science distribution credit. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000.

**PSYCH 2003. Topics in Psychology-Behavioral Science. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course carries behavioral science distribution credit for non-psychology majors. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2110. Learning, Memory, and Cognition. 3 Credits.**

Students will gain an understanding of the fundamental principles of learning, memory and cognition, and will be able to recognize important historical figures and their contributions. Students will also learn how the principles can be applied to their everyday lives. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2210. Mind, Brain, and Behavior. 3 Credits.**

Introduction to the structures and processes of the mind and the nervous system, including the psychobiology of eating, sleeping, emotion, stress and learning. Prerequisite: Psychology [PSYCH] 1000. No credit if taken

after PSYCH 4210. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2220. Drugs and Behavior. 3 Credits.**

Basic principles of drug action on the nervous system; the effects of important psychoactive drugs; drug use and society. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2310. Social Psychology. 3 Credits.**

An introduction to how people's thoughts, feelings and behaviors are influenced by the actual or imagined thoughts, feelings and behaviors of others. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2320. Introduction to Personality. 3 Credits.**

Personality is the scientific study of individual differences (e.g., traits, motives, abilities). This course reviews historical theoretical perspectives as well as current research. Students will have an opportunity to learn about on their own motives and traits. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2410. Developmental Psychology. 3 Credits.**

Origins and development of child behavior, emphasizing basic physical, cognitive, affective and social processes, and theory and research rather than application or guidance. Prerequisite: Psychology [PSYCH] 1000. Cannot receive credit for more than one of the following: PSYCH 2410, Human Development and Family Studies [H\_D\_FS] 2420/3420 or Educational School and Counseling Psychology [ESC\_PS] 2500. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2410H. Developmental Psychology - Honors. 3 Credits.**

Origins and development of child behavior, emphasizing basic physical, cognitive, affective and social processes, and theory and research rather than application or guidance. Prerequisite: Psychology [PSYCH] 1000. Cannot receive credit for more than one of the following: PSYCH 2410, Human Development and Family Studies [H\_D\_FS] 2420/3420 or Educational, School and Counseling Psychology [ESC\_PS] 2500. Honors eligibility required. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2510. Survey of Abnormal Psychology. 3 Credits.**

Basic survey of maladaptive human behavior and experience, including personality disorders, alcohol and drug abuse, anxiety and mood disorders, sexual dysfunctions, and thought disorders. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2810. Human Sexuality. 3 Credits.**

Survey of research on sexual behavior including sex norms, gender identity, sexual dysfunctions, sexual deviation, homosexuality, and legal aspects of sexual behavior. Attendance at small group discussions may be required at the option of the instructor. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 2820. Introduction to Cognitive Science. 3 Credits.**

(same as Linguistics [LINGST] 2820 and Philosophy [PHIL] 2820). Cognitive science is the interdisciplinary study of the mind. After an overview of the foundations of cognitive science as a whole, we will see what particular sectors of it have to say about mental capacities such

as vision, language, categorization, and social cognition. Prerequisites: Psychology [PSYCH] 1000; sophomore standing required.

**PSYCH 2830. Human-Companion Animal Interaction. 3 Credits.**

Exploration of historical and theoretical bases of human-companion animal interaction (HAI), the nature issues, and clinical applications of HAI. Prerequisite: Psychology [PSYCH] 1000. Graded on A/F basis only.

**PSYCH 2940. Internship in Psychology. 3-6 Credit.**

Work experience in an organization that is relevant to the psychology major. Prerequisites: must be in good standing and have completed 9 credit hours in psychology; instructor's consent. Intended for students with freshman or sophomore standing.

**PSYCH 2950. Special Problems in Psychology. 1-99 Credit.**

Research apprenticeship with a faculty member, assisting a faculty member in the development and execution of research. May be repeated to 6 hours maximum. Prerequisite: instructor's consent.

**PSYCH 3001. Topics in Psychology-General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course may not be used toward behavioral science distribution credit. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000.

**PSYCH 3003. Topics in Psychology-Behavioral Science. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course carries behavioral science distribution credit for non-psychology majors. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3010. Research Methods in Psychology I. 3 Credits.**

Introduction to scientific reasoning, assessing validity and reliability in research, and basic research methods. Prerequisites: Psychology [PSYCH] 1000, concurrent enrollment in Statistics [STAT] 1200 or a grade of C or better in STAT 1200 (or its equivalent.) This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3010H. Research Methods in Psychology I- Honors. 3 Credits.**

Introduction to scientific reasoning, assessing validity and reliability in research, and basic research methods. Prerequisites: Psychology [PSYCH] 1000, concurrent enrollment in Statistics [STAT] 1200 or a grade of C or better in STAT 1200 (or its equivalent). Honors eligibility required. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3020. Research Methods in Psychology II. 3 Credits.**

Continuation of Psychology 3010 and required for all further labs in psychology. Prerequisite: Psychology [PSYCH] 1000, and a grade of C or better in PSYCH 3010 and Statistics [STAT] 1200 (or its equivalent). This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3020H. Research Methods in Psychology II - Honors. 3 Credits.**

Continuation of Psychology 3010 and required for all further labs in psychology. Prerequisite: grade of C or better in Psychology [PSYCH] 3010 and Statistics [STAT] 1200 (or its equivalent). Honors eligibility required. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3110. Theories of Learning. 3 Credits.**

Discusses classical issues and theories in learning and conditioning, and considers them in contemporary form. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3130. Decisions, Values and Choice. 3 Credits.**

Survey of factors influencing choices and decisions. Topics include cause and effect decisions, values and ethical considerations, outcome likelihood, biases and heuristics, concept formation, self-control and impulsiveness, and social factors. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3140. Cognitive Psychology. 3 Credits.**

A survey of psychological theory and research on human cognition. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3150. Human Memory. 3 Credits.**

Surveys research on human memory, including basic laboratory studies with normal subjects as well as research on amnesia and other memory impairments, life-span memory development, and the cognitive neuroscience of memory. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3160. Perception and Thought. 3 Credits.**

Covers research on various aspects of mental life: language, problem-solving, decision-making, sensory perception. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3310. Intergroup Relations. 3 Credits.**

Provides an overview of the social psychological literature on stereotyping, prejudice, discrimination, and intergroup relations. Students learn theoretical frameworks and research findings regarding the development and maintenance of intergroup conflict. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3330. Human Aggression. 3 Credits.**

Examines human aggression from a social psychological perspective. Topics include cognitive, affective, developmental, and biological aspects. The effects of media violence and other societal factors are also examined. Prerequisite: Psychology [PSYCH] 2310.

**PSYCH 3350. Positive Psychology. 3 Credits.**

This course introduces students to the science of positive psychology, including its origin and the historical imbalances it addresses within the broader field of psychology. A wide variety of topics are covered, including happiness, materialism, purpose, flow, courage, humility, positive emotions, curiosity, mindfulness, savoring, gratitude, forgiveness, personal strengths, resilience, and compassion. Prerequisites: PSYCH 1000, This course may be restricted to Undergraduate Psychology Majors during early registration.

**PSYCH 3410. Infancy. 3 Credits.**

Overview of theory and research on the development of infants and toddlers, with an emphasis on major research methods that are currently in use. Topics include infant perception, sociality, motor development, early communication, language development and attachment. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3420. Cognitive Development in Childhood. 3 Credits.**

Theories and research on cognitive development in childhood.  
Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3430. Social Development in Childhood. 3 Credits.**

Overview of children's social and emotional development (infancy-adolescence), includes changes in social domains, impact of social functioning on subsequent development, and influence of interpersonal contexts (e.g., family, peers, community) on children's development.  
Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3510. Introduction to Clinical Psychology. 3 Credits.**

Comprehensive survey of the field's historical roots, research methods, concepts of abnormality, assessment and intervention methods; also specialties that constitute clinical psychology. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3810. Normal Language Development. 3 Credits.**

(same as Communication Science and Disorders [C\_S\_D] 3020).  
Language development in children and changes in language processing during normal aging. Cognition and language; language learning processes, language sample analysis; relationship between spoken and written language. Prerequisite: Psychology [PSYCH] 2410 or 3140, or Linguistics [LINGST] 4600. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3820. Environmental Psychology. 3 Credits.**

Survey of the effects of human behavior on the natural environment. Examines strategies for modifying behavior to preserve the environment.  
Prerequisite: Psychology [PSYCH] 1000.

**PSYCH 3830. Health Psychology. 3 Credits.**

A hands-on approach to the study of health psychology including research on a topic of current relevance to the field. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3860. Law and Psychological Science. 3 Credits.**

This survey course examines the interactions of law and psychology across the justice system. Emphasis is placed on how psychological research does (and does not) inform important legal issues. Requirements may include an in-class team debate of relevant controversy in law. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 3870. Sleep and Sleep Disorders. 3 Credits.**

This course provides a critical review of the current research on both normal sleep and sleep disorders.

**PSYCH 3880. African-American Psychology. 3 Credits.**

(Same as Black Studies [BL\_STU] 3100 and Educational School, Counseling Psychology [ESC\_PS] 3100). The research, theories and paradigms developed to understand the attitudes, behaviors and psychosocial realities of African-Americans are discussed. Prerequisite: Psychology [PSYCH] 1000. Graded on A/F basis only.

**PSYCH 4001. Topics in Psychology-General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course may not be used toward behavioral science distribution credit. Repeatable upon consent

of department. Prerequisites: Psychology [PSYCH] 1000 and instructor's consent.

**PSYCH 4003. Topics in Psychology-Behavioral Science. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. This course carries behavioral science distribution credit for non-psychology majors. Repeatable upon consent of department. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4110. Perception. 3 Credits.**

Data and contemporary theories of perception in all of the senses, with emphasis on visual and auditory perception. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4210. Physiological Psychology. 3 Credits.**

An introduction to neuroscience with an overview of the relation between the brain and behavior. Topics include intercellular communication, drugs and reward, emotions and stress psychoimmunology, psychopathology, nervous system development and repair, perception, cognition, learning and memory. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4220. Animal Learning and Behavior. 3 Credits.**

Survey of animal behavior and learning abilities, including topics such as learning, habitat selection, foraging, problem solving, mating, communication, conditioning and memory. Prerequisite: Psychology [PSYCH] 1000 plus 8 hours of Psychology (exclusive of PSYCH 2950) or Biology. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4240. Cognitive Neuroscience. 3 Credits.**

The neural basis of human information processing in memory, attention, perception, imagery, movement, and language. Prerequisites: Psychology [PSYCH] 2210 or 4210 recommended. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4340. Attitude Change. 3 Credits.**

Theories, methods, and experimental findings in attitude change research. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4350. Stereotypes and Prejudice. 3 Credits.**

This course provides an overview of theory and research on stereotypes, prejudice, and discrimination from a social-psychological perspective. Course material comes primarily from textbook and supplementary readings, in addition to videos related to these topics. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4420. Personality Development. 3 Credits.**

This course covers the topic of temperament and personality development through the lifespan with particular focus on infancy, childhood, and adolescence. Coverage includes classic and contemporary theories and classic and contemporary research. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4430. Literature and Human Lifespan. 3 Credits.**

In this course we will examine the processes of human development as they are reflected in the specific literary and cinematic texts. "Adult" literary and cinematic materials will be supplemented with notable



examples of adolescent and children's stories, so that the works (like their subjects) will mirror the life span. This course will also provide an overview of prominent developmental theories/research, which have been devoted to understanding the life span. This course is designed to stimulate active reflection and debate about the impact of literature on human development. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4440. Sex Differences. 3 Credits.**

This course covers the evolution of sex differences and hormonal and environmental influences on their expressions in nonhuman species. These insights are used to understand human sex differences in mate choices, emotions, development, brain and cognition, and in modern societies. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4520. Behavior Genetics. 3 Credits.**

The study of genetic influences on behavioral traits such as mood, personality, intelligence, mental health, or activity level. Prerequisite: Psychology [PSYCH] 3020. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4530. Research in Psychopathology. 3 Credits.**

Intensive survey and evaluation of the psychological literature on abnormal behavior, emphasizes experimental and explanatory approaches. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4540. Emotional Disorders in Childhood and Adolescence. 3 Credits.**

Surveys disturbed behavioral development during childhood and adolescence, emphasizing factors that produce deviation from normal developmental patterns. Prerequisites: Psychology [PSYCH] 2410 or equivalent. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4560. Schizophrenia. 3 Credits.**

This course will examine one of the most severe, debilitating, and complex mental disorders. We will review the major symptoms and clinical features of schizophrenia, explore possible causes of Psychology [PSYCH] disorder, and critically assess treatments for the disorder. Prerequisite: PSYCH 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4570. Pediatric Neuropsychology. 3 Credits.**

Introduction to the field of pediatric neuropsychology and the study of individuals with early brain dysfunction. Common central nervous system disorders of childhood (e.g. autism, ADHD, epilepsy) will be discussed. Prerequisites: Psychology [PSYCH] 1000, PSYCH 2210 or 4240 recommended. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4810. Industrial/Organizational Psychology. 3 Credits.**

Survey of basic and applied personnel and organizational psychology. Focus on the human relations field, job satisfaction, leadership, group dynamics and formal organizational structures within the realm of industry. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4815. Cross-Cultural Psychology. 3 Credits.**

This course aims to explore relationships between cultural variables and human behavior, and to look at recent attempts by cross-cultural

psychologists to devise theories that reflect the cultural, social and developmental perspectives on behavior. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4815H. Cross-Cultural Psychology - Honors. 3 Credits.**

The Cross-cultural Psychology course aims to explore relationships between cultural variables and human behavior, and to look at recent attempts by cross-cultural psychologists to devise theories that reflect the cultural, social and developmental perspectives on behavior. Prerequisite: Psychology [PSYCH] 1000; Honors eligibility required. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4825. Psychology at the Movies. 3 Credits.**

In this course we watch and discuss films from multiple psychological perspectives. Connections are made between cinematic content and contemporary psychological research on culture and diversity. Race, Gender, Disability, Class, and LGBT issues in movies are explored. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4830. Psychology of Women. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4830). Overview of current theories and research relating to the psychology of women. Topics include gender stereotyping, psychological sex differences, achievement motivation in women, and women and mental health. Prerequisite: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4840. The History of Psychology. 3 Credits.**

Historical foundations of contemporary psychology. Prerequisites: Psychology [PSYCH] 1000. This course may be restricted to Undergraduate Psychology Majors during Early Registration.

**PSYCH 4940. Internship in Psychology. 3-6 Credit.**

Work experience in an organization that is relevant to the psychology major. Prerequisites: must be in good standing and have completed 9 credit hours in psychology; instructor's consent. Intended for students with junior or senior standing.

**PSYCH 4950. Special Problems in Psychology. 1-99 Credit.**

Independent investigation leading to a project or paper. Repeatable upon consent of department. Prerequisite: instructor's consent.

**PSYCH 4960. Special Readings in Psychology. 1-99 Credit.**

Independent readings selected in consultation with supervisory faculty member. Repeatable upon consent of department. Prerequisite: instructor's consent.

**PSYCH 4970. Psychological Measurement Capstone. 3 Credits.**

Survey of theories and methods of psychological test construction, focusing on measures of intelligence and personality. Lab component involves experimental training in test construction and test evaluation. Prerequisite: grade of C or better in Psychology [PSYCH] 3020. This course is restricted to psychology majors with senior standing.

**PSYCH 4971. Developmental Psychology Capstone. 3 Credits.**

Introduces students to developmental research methods through relevant readings and by students conducting original research. Prerequisite: grade of C or better in Psychology [PSYCH] 3020. This course is restricted to psychology majors with senior standing.

**PSYCH 4972. Animal Learning Capstone. 3 Credits.**

Survey of principles of animal behavior and animal learning and cognition. The course includes laboratory projects on research in animal

behavior and animal learning. Prerequisites: grade of C or better in Psychology [PSYCH] 3020. This course is restricted to psychology majors with senior standing.

**PSYCH 4973. Human Cognition Capstone. 3 Credits.**

Students review, evaluate and conduct research on various aspects of human cognition. Prerequisite: grade of C or better in Psychology [PSYCH] 3020. This course is restricted to psychology majors with senior standing.

**PSYCH 4974. The Human Senses Capstone. 3 Credits.**

Psychophysical data, sense organs, psychological attributes, and theories of vision, hearing, and the vestibular (motion) senses. Elementary aspects of psychophysics. Prerequisite: grade of C or better in Psychology [PSYCH] 3020. This course is restricted to psychology majors with senior standing.

**PSYCH 4975. Social/Personality Capstone. 3 Credits.**

Experimental methods course emphasizing research in social psychology. Prerequisites: grade of C or better in Psychology [PSYCH] 3020. This course is restricted to psychology majors with senior standing.

**PSYCH 4976H. Honors Research Seminar I. 3 Credits.**

Individual honors thesis on a topic selected with a faculty advisor. Student projects are carried out over the course of two semesters (Psychology [PSYCH] 4977 in spring semester). Students should plan on enrollment in both PSYCH 4976 and 4977. Weekly class discussions of research topics, strategies and of current issues. Prerequisites: PSYCH 3020; overall and Psychology GPA 3.3 and instructor's consent. Successful completion of thesis and maintenance of 3.3 GPA leads to degree with departmental honors in Psychology. This course is restricted to psychology majors with senior standing.

**PSYCH 4977H. Honors Research Seminar II. 3 Credits.**

Honors eligibility required. Prerequisite: Psychology [PSYCH] 4976. This course is restricted to psychology majors with senior standing.

**PSYCH 4978. Clinical Psychology Capstone. 3 Credits.**

Students work at assigned agencies to gain "real-world" experience in the practice of psychology and attend regularly scheduled class meetings in order to integrate their academic knowledge with their practical experience. Prerequisites: grade of C or better in Psychology [PSYCH] 3020; departmental consent. This course is restricted to psychology majors with senior standing.

**PSYCH 4979. Judgement and Decision Making Capstone. 3 Credits.**

This course examines the psychology of human judgement and decision-making. We will discuss major theories, methods and basic experimental findings and identify how those findings are being used to develop public policy or in applied settings. Prerequisites: grade of C or better in Psychology [PSYCH] 2030; This course is restricted to psychology majors with senior standing.

**PSYCH 4980. Human Relationships Capstone. 3 Credits.**

Students design a study, collect data, and describe their research on some aspect of human relationships. Emphasis on survey research techniques. Prerequisites: grade of C or better in Psychology [PSYCH] 3020, PSYCH 2810 or two social/personality courses recommended; departmental consent. This course is restricted to psychology majors with senior standing.

**PSYCH 4981. Advanced Developmental Psychology Capstone I. 3 Credits.**

Students propose a study to be conducted with preschool children. The course teaches skills needed to develop research questions,

develop a coding system, and write a research proposal that reviews past literature in a way that makes the case for the importance of the project. Prerequisite: grade of C or better in Psychology [PSYCH] 3020; departmental consent; restricted to psychology majors with senior standing. Graded on A/F basis only.

**PSYCH 4982. Advanced Developmental Psychology II. 3 Credits.**

Students conduct a research project involving observations of preschool children. The course teaches skills needed to collect data, analyze data, and write a research report. These skills provide excellent preparation for graduate school in psychology or a related field. Prerequisite: grade of C or better in Psychology [PSYCH] 3020; department consent; restricted to psychology majors with senior standing. Graded on A/F basis only.

**PSYCH 7001. Topics in Psychology - General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. Graduate credit will be earned through additional reading and assignments. Prerequisites: instructor's consent; departmental consent for repetition.

**PSYCH 7003. Topics in Psychology - Behavioral Science. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. Graduate credit will be earned through additional reading and assignments. Prerequisites: instructor's consent; departmental consent for repetition.

**PSYCH 7085. Problems in Psychology. 1-99 Credit.**

Advanced studies to meet needs of individual student. Graded on S/U basis only. Prerequisites: instructor's consent.

**PSYCH 7210. Physiological Psychology. 3 Credits.**

An introduction to neuroscience giving an overview of the relation between the brain and behavior. Topics include intercellular communication, drugs and reward, emotions and stress psychoimmunology, psychopathology, nervous system development and repair, perception, cognition, learning and memory. Prerequisite: graduate standing and Psychology [PSYCH] 1000.

**PSYCH 7240. Cognitive Neuroscience. 3 Credits.**

The neural basis of human information processing. Memory, attention, perception, imagery, movement, and language. Prerequisites: graduate standing and Psychology [PSYCH] 2210 or 4210 recommended.

**PSYCH 7340. Attitude Change. 3 Credits.**

Theories, methods, and experimental findings in attitude change research. Prerequisite: graduate standing and Psychology [PSYCH] 1000.

**PSYCH 7420. Personality Development. 3 Credits.**

This course covers the topic of temperament and personality development through the lifespan with particular focus on infancy, childhood, and adolescence. Coverage includes classic and contemporary theories and classic and contemporary research. Prerequisite: graduate standing Psychology [PSYCH] 1000.

**PSYCH 7520. Behavior Genetics. 3 Credits.**

The study of genetic influences on behavioral traits such as mood, personality, intelligence, mental health, or activity level. Prerequisite: departmental consent required.

**PSYCH 7530. Research in Psychopathology. 3 Credits.**

Intensive survey and evaluation of the psychological literature on abnormal behavior, emphasizes experimental and explanatory approaches. Prerequisite: graduate standing and Psychology [PSYCH] 1000.

**PSYCH 7540. Emotional Disorders in Childhood and Adolescence. 3 Credits.**

Surveys disturbed behavioral development during childhood and adolescence, emphasizing factors that produce deviation from normal developmental patterns. Prerequisites: graduate standing and Psychology [PSYCH] 2410 or equivalent.

**PSYCH 7550. Introduction to Clinical Psychology. 3 Credits.**

Comprehensive survey of the field's historical roots, research methods, concepts of abnormality, assessment and intervention methods; also specialties that constitute clinical psychology. Prerequisites: graduate standing and Psychology [PSYCH] 1000.

**PSYCH 7560. Schizophrenia. 3 Credits.**

Examines symptoms, possible causes, and treatments of schizophrenia. Goals include understanding psychopathology by examining one disorder and reviewing cutting edge psychology and clinical science research being used to understand schizophrenia. Prerequisite: Psychology [PSYCH] 1000.

**PSYCH 7810. Industrial/Organizational Psychology. 3 Credits.**

Survey of basic and applied personnel and organizational psychology. Focus on the human relations field, job satisfaction, leadership, group dynamics and formal organizational structures within the realm of industry. Prerequisite: graduate standing and Psychology [PSYCH] 3010.

**PSYCH 7815. Cross-Cultural Psychology. 3 Credits.**

This course aims to explore relationships between cultural variables and human behavior, and to look at recent attempts by cross-cultural psychologists to devise theories that reflect the cultural, social and developmental perspectives on behavior. Prerequisite: Psychology [PSYCH] 1000 and departmental consent.

**PSYCH 7830. Psychology of Women. 3 Credits.**

Overview of current theories and research relating to the psychology of women. Topics include gender stereotyping, psychological sex differences, achievement motivation in women, and women and mental health. Prerequisite: graduate standing and Psychology [PSYCH] 1000.

**PSYCH 7840. The History of Psychology. 3 Credits.**

Historical foundations of contemporary psychology. Prerequisites: graduate standing and Psychology [PSYCH] 1000.

**PSYCH 8001. Topics in Psychology-General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. Prerequisites: instructor's consent, departmental consent for repetition.

**PSYCH 8050. Research in Psychology - Non-Thesis. 1-99 Credit.**

Research in psychology not leading to thesis. Graded on S/U basis only. Prerequisite: instructor's consent.

**PSYCH 8085. Problems in Psychology. 1-99 Credit.**

Advanced studies to meet needs of individual student. Graded on S/U basis only. Prerequisites: instructor's consent.

**PSYCH 8090. Research in Psychology - Thesis. 1-99 Credit.**

Research in psychology leading to thesis. Graded on S/U basis only. Prerequisite: instructor's consent.

**PSYCH 8110. Cognitive Psychology. 3 Credits.**

Focuses on basic research on human perception, memory, attention, language, and thought. Prerequisites: instructor's consent.

**PSYCH 8210. Functional Neuroscience. 3 Credits.**

Basic techniques, data and theory in the neurosciences applied to the study of psychopathology, psychopharmacology, neural development, brain damage, memory and other areas of "behavior." Prerequisites: instructor's consent.

**PSYCH 8310. Survey of Social Psychology. 3 Credits.**

Survey of historical and contemporary theory and research in affiliation, attribution, social comparison, attitude change and group dynamics. Prerequisite: instructor's consent.

**PSYCH 8410. Psychology of Development. 3 Credits.**

Principles, theories, research in normal human development. Prerequisite: instructor's consent.

**PSYCH 8420. Cognitive Development. 3 Credits.**

(same as Human Development and Family Studies [H D FS] 8420). An introduction to central theories and issues in the study of cognitive development in infancy and childhood. Emphasis is on major theoretical frameworks for studying cognitive development, and topics such as perception, memory, language, categorization, and reasoning. Prerequisite: instructor's consent.

**PSYCH 8430. Temperament and Personality Development. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 8430). Intended for graduate students in psychology and related fields. This course is a survey of theory and research in the area of temperament and personality development, with emphasis on child development. Prerequisite: instructor's consent.

**PSYCH 8440. Social and Emotional Development. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 8440). There are two major objectives for this course. The first is a "content" objective and involves familiarizing students with theory and research regarding social, emotional, and personality development in childhood and adolescence and also regarding the relationships in which such development takes place. The second objective is a "process" objective and involves enhancing students skills at interpreting empirical research, identifying gaps in the literature, and identifying research strategies for addressing those gaps.

**PSYCH 8510. Developmental Psychopathology. 3 Credits.**

Etiology, diagnosis, and treatment of disordered behavior from infancy through adolescence. Emphasizes contrasting theories and research issues. Prerequisite: instructor's consent.

**PSYCH 8520. Adult Psychopathology. 3 Credits.**

Problems of etiology, diagnosis, treatment in psychopathology. Considers theory, research, case histories. Prerequisite: instructor's consent.

**PSYCH 8530. Experimental Psychopathology. 3 Credits.**

Critical examination of current theories, with special emphasis on empirical studies in psychopathology including such topics as alcoholism, enuresis, sexual deviancy, drug addiction, mental retardation. Prerequisite: instructor's consent.

**PSYCH 8610. Motivation. 3 Credits.**

Survey of historical and contemporary theories and models of human motivation. Major emphasis on different levels of motivational analysis. Prerequisite: instructor's consent.

**PSYCH 8620. Personality Psychology. 3 Credits.**

Graduate-level introduction to the field of personality psychology, including readings and discussion of both classic and contemporary works. Prerequisite: instructor's consent.

**PSYCH 8710. General Linear Models in Psychology I. 4 Credits.**

Principles of interval estimation and hypothesis testing, scalar and matrix forms of simple and multiple regression with continuous and categorical predictors, regression diagnostics. Prerequisite: undergraduate course in statistics; concurrent enrollment in Psychology [PSYCH] 8730; instructor's consent.

**PSYCH 8720. General Linear Models in Psychology II. 4 Credits.**

Complex analysis of variance; experimental design. Prerequisite: Psychology [PSYCH] 8710 or equivalent, concurrent enrollment in PSYCH 8730; instructor's consent.

**PSYCH 8730. Data Management and Analysis in Psychology. 1 Credit.**

Computer implementation of data management and statistical analysis. Covers elementary computer operations, data entry and quality control, and computer implementation of statistical models covered in Psychology [PSYCH] 8710 and 8720. Prerequisite: instructor's consent.

**PSYCH 8910. Ethics and Professional Issues I. 1 Credit.**

This course exposes students to issues of ethics and professional behavior in the psychological sciences. Graded on A/F basis only.

**PSYCH 8920. Social and Behavioral Sciences in Public Health. 3 Credits.**

(same as Public Health [P\_HLTH] 8920). This course will take both a theoretical and a practical approach to understanding health-related behavior and the field of public health. Students will gain an understanding of theory and empirical research in the social and behavioral sciences, as well as developing practical skills in critically evaluating research and in applying scientific evidence to address real world health concerns.

**PSYCH 9001. Topics in Psychology-General. 1-99 Credit.**

Organized study of selected topics in psychology. Particular topic and earnable credit may vary by semester. Prerequisites: instructor's consent, departmental consent for repetition.

**PSYCH 9050. Research in Psychology - Non-Dissertation. 1-99 Credit.**

Research in Psychology not leading to dissertation. Graded on S/U basis only. Prerequisite: instructor's consent.

**PSYCH 9085. Problems in Psychology. 1-99 Credit.**

Advanced studies to meet needs of individual student. Prerequisite: instructor's consent. Departmental consent for repetition. Graded on S/U basis only.

**PSYCH 9090. Research in Psychology - Dissertation. 1-99 Credit.**

Research in Psychology leading to dissertation. Graded on S/U basis only. Prerequisite: instructor's consent.

**PSYCH 9110. Studies in Experimental Psychology. 3 Credits.**

Critical consideration of selected research in neuroscience and cognitive psychology. Prerequisites: Psychology [PSYCH] 4972 or PSYCH 4973; departmental consent for repetition; instructor's consent.

**PSYCH 9120. Studies in Physiological Psychology. 1 Credit.**

Weekly seminars given by local and regional cognitive psychologists and cognitive neuroscientists. Prerequisite: Psychology [PSYCH] 7210, departmental consent for repetition, and instructor's consent. Graded on S/U basis only.

**PSYCH 9150. Human Learning and Memory. 3 Credits.**

Current theory and research in the area of human learning and memory will be investigated. A major component of the course will involve the

critical review of existing literature in this area. Prerequisite: instructor's consent.

**PSYCH 9210. Psychopharmacology. 3 Credits.**

Basic principles of drug action on the nervous system, the theory and clinical use of the various psychotherapeutic drugs, drug abuse and its treatment. Prerequisite: instructor's consent.

**PSYCH 9220. Clinical Neuropsychology Seminar. 3 Credits.**

In this course students will analyze published cases in the neuropsychology literature. By studying how behavioral and mental processes break down, the supposition is that one can infer how intact processes must have been constructed, and how a brain supports them. Instructor's consent required. Graduate Standing Required.

**PSYCH 9230. Seminar on fMRI. 3 Credits.**

Fundamentals of MRI and its application to brain imaging, including experimental design, analysis and contemporary issues. During the lab component, students will use FSL and other software to analyze fMRI data and will design and implement their own fMRI experiments. Prerequisite: graduate standing; instructor's consent.

**PSYCH 9310. Theories of Social Psychology. 3 Credits.**

Intensive review of classic and contemporary concepts and theories of social psychology; emphasizes readings from primary sources. PhD candidates only. Required for all PhD candidates in social psychology. Prerequisite: instructor's consent.

**PSYCH 9320. Social Psychology Methodology. 3 Credits.**

Advanced study of experimental methods in social psychological research. Prerequisites: instructor's consent.

**PSYCH 9330. Field Research Methods. 3 Credits.**

Advanced course in research methods and designs commonly used in field settings; theoretical, ethical, and pragmatic issues that arise in field settings are considered; emphasis is on learning and skill acquisition through a series of hands-on assignments. Prerequisite: instructor's consent.

**PSYCH 9350. Studies in Social Psychology. 1-99 Credit.**

Critical coverage of selected research and theory in social psychology. Prerequisites: instructor's consent, departmental consent for repetition.

**PSYCH 9360. Seminar in Social Psychology. 1 Credit.**

Intensive review of concepts and theories of social psychology; emphasizes readings from primary sources. Ph.D. candidates only. Required for all Ph.D. candidates in social psychology program. Prerequisite: instructor's consent. Graded on S/U basis only.

**PSYCH 9440. Studies in Developmental Psychology. 1-99 Credit.**

Covers contemporary research and professional topics in developmental psychology. Prerequisite: instructor's consent. Graded on S/U basis only.

**PSYCH 9460. Studies in Evolution and Behavior. 1 Credit.**

Reading and discussion of classic and contemporary works in evolution. Prerequisites: Graduate standing and instructor's consent.

**PSYCH 9510. Studies in Clinical Psychology. 1-99 Credit.**

Contemporary research and theory for advanced graduate students in clinical psychology. Prerequisite: instructor's consent, departmental consent for repetition. Graded on S/U basis only.

**PSYCH 9515. Orientations in Psychotherapy. 3 Credits.**

The introductory psychotherapy course for students in the clinical psychology doctoral program. The focus of the course is on development of knowledge and skills in the following four areas: (1) Theory and practice of contemporary (brief) psychotherapy; (2) Basic interviewing

skills; (3) Psychotherapy research and empirically supported treatments; and (4) The role and impact of managed care in contemporary psychotherapy. Prerequisite: instructor's consent.

**PSYCH 9520. Psychometrics. 3 Credits.**

Introduction to concepts and issues essential to psychological assessment including psychometrics, test construction, controversies in psychological testing, behavioral assessment, and structured interviewing. Prerequisite: instructor's consent.

**PSYCH 9525. Orientations to Clinical Assessment. 3 Credits.**

Topics include psychometric principles, intelligence testing, objective and projective personality testing and behavioral assessment. Prerequisite: Psychology [PSYCH] 9520 and instructor's consent.

**PSYCH 9530. Clinical Child Assessment. 3 Credits.**

Introduction to clinical instruments, techniques and problems in the psychological assessment of children. Prerequisite: instructor's consent.

**PSYCH 9540. Ethical and Professional Issues II. 3 Credits.**

Legal issues, state and national codes, ethical decision-making, dangerousness, ethical clinical treatment issues, mandated reporting, and ethics in specialized clinical settings. This course is the second in a sequence for clinical psychology doctoral students. Prerequisite: instructor's consent.

**PSYCH 9545. Clinical Practicum. 1-99 Credit.**

Intensive supervised training in use and interpretation of psychological techniques and in psychotherapy. Graded on S/U basis only. Prerequisite: instructor's consent and professional liability insurance.

**PSYCH 9550. Clinical Intervention with Children. 3 Credits.**

Introduction to theory, research and practice in the area of behavior change with children and adolescents. Prerequisite: instructor's consent.

**PSYCH 9560. Family and Group Process. 3 Credits.**

Theory, intervention, and research in the areas of family and group dynamics. Emphasis on family therapy approaches. Prerequisite: instructor's consent.

**PSYCH 9570. Assessment and Treatment of Sexual Problems. 3 Credits.**

Background information for and methods and techniques of dealing with a variety of sexual problems that clients bring to therapists. Sexual dysfunction, homosexuality, sexual aberrations and sex crimes covered. Prerequisite: instructor's consent.

**PSYCH 9575. Clinical Research Methods. 3 Credits.**

Focus on research design with emphasis on active critique of methodological challenges (e.g., subject selection, control groups, multimodal measures, and treatment issues), includes lecture and active review or research. Prerequisite: instructor's consent.

**PSYCH 9580. Seminar in Clinical Psychology. 3 Credits.**

Critical coverage of selected research and theory in clinical psychology. Prerequisite: instructor's consent, departmental consent for repetition.

**PSYCH 9585. Introduction to Alcohol Studies. 3 Credits.**

Intensive seminar on alcohol research primarily intended for alcohol research training fellows. Covers a range of topics of interest to psychologist, including pharmacology, research methods, genetics, diagnosis, expectancies, and treatment. Prerequisite: instructor's consent.

**PSYCH 9590. Clinical Pediatric Neuropsychology. 3 Credits.**

The goal of this course is to provide an in-depth introduction to the field of clinical pediatric neuropsychology. Particular emphasis will be placed

on how we can increase our understanding of development through the study of individuals with early brain dysfunction. Prerequisite: graduate standing; instructor's consent.

**PSYCH 9710. Multivariate Statistics in Psychology. 3 Credits.**

Multivariate statistical methods, including multivariate analysis of variance, discriminant analysis, principal component analysis, and elements of matrix algebra, as applied to problems in psychology. Prerequisite: Psychology [PSCYH] 8710 and 8720; instructor's consent.

**PSYCH 9715. Multilevel Modeling. 3 Credits.**

Introduction to random coefficient multilevel modeling of clustered data. Topics include two- and three-level models, estimation techniques, computing options, model fitting issues, advanced model applications, and growth modeling. Prerequisite: instructor's consent, a graduate course in regression analysis.

**PSYCH 9720. Latent Variable Models in Statistical Analysis. 3 Credits.**

Covers Matrix Algebra fundamentals, Factor Rotation, Communality Estimation techniques, High Order and Dynamic Factor Models, Path Analysis, Use of computer programs. Prerequisite: instructor's consent and Psychology [PSYCH] 8720.

**PSYCH 9725. The Literature Review. 3 Credits.**

Focuses on methods for gathering, summarizing, integrating and interpreting research on a particular research issue. Topics include searching the literature, evaluating research quality and synthesizing statistical results across separate studies. Prerequisite: Psychology [PSYCH] 8710 and instructor's consent.

**PSYCH 9735. Psychological Process Models. 3 Credits.**

Examines mathematical and statistical models of cognition and perception. Emphasis on modeling basics such as estimation, hypothesis testing, and assessment of fit. Prerequisites: Psychology [PSYCH] 8710 and 8720 or instructor's consent.

**PSYCH 9740. Statistical Consulting for Psychologists. 1-99 Credit.**

Provision of statistical consulting to individuals working with psychological data. Prerequisite: graduate standing in Psychological Sciences and instructor's consent. Graded on S/U basis only.

**PSYCH 9750. Advanced Structural Equation Modeling. 3 Credits.**

Growth Mixture Models, Dynamic Factor models, and nonlinear structural models. Prerequisites: Psychology [PSYCH] 8710 or departmental consent. Graduate Standing Required.

**PSYCH 9755. Quantitative Psychology Seminar. 1 Credit.**

Quantitative Psychology Topics Seminar. Prerequisite: graduate standing; departmental consent required. Graded on S/U basis only.

**PSYCH 9760. Categorical Data Analysis. 3 Credits.**

This course will provide an applied introduction to the most important methods for analyzing categorical data. Topics include; logistic regression modeling Poisson regression modeling, multinomial sampling, and classic analysis of contingency tables. Prerequisite: Psychology [PSYCH] 8710 and 8720; instructor's consent.

**PSYCH 9765. Cluster Analysis and Network Analysis. 3 Credits.**

The course covers traditional and modern clustering techniques (hierarchical, partitioning, and mixture modeling), both from an algorithmic and modeling perspective. Several types of data types are explored, including traditional two-mode data sets and network structures. Graduate Standing required. Consent of instructor required.

**PSYCH 9910. Teaching of Psychology Practicum. 1-99 Credit.**

Focuses on development and enhancement of teaching skills for graduate students in psychology who are primary instructors of undergraduate psychology courses. Graded on a S/U basis only. Prerequisite: instructor's consent.

**PSYCH 9920. Advanced History of Psychology. 3 Credits.**

Advanced course in history of psychology designed to show how general philosophical models of mind and behavior have been linked to doctrines of mental health and pathology and to theories of social behavior. Prerequisite: instructor's consent.

## Public Affairs (PUB\_AF)

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**PUB\_AF 4001. Topics in Public Affairs. 3 Credits.**

Selected topics in public administration.

**PUB\_AF 7001. Topics in Public Affairs. 3 Credits.**

Select current topics in public affairs. Prerequisite: consent required. Graded on A/F basis only.

**PUB\_AF 7330. Scientific & Technological Aspects Terrorism & Counter Terrorism. 3 Credits.**

(same as Nuclear Engineering [NU\_ENG] 7330). Terrorism has been a familiar tool of political conflict, and it has assumed greater importance during the past twenty years. This subject has been treated by political scientists in various forms, but the scientific and technological aspects of different forms of terrorism cannot be found in a single place. It is important for persons who propose counter measures to understand the basics of different types of terrorism such as for instance the nature of chemical agents, their properties such as toxicity, etc. in order to build better defense systems. Prerequisite: graduate standing.

**PUB\_AF 7357. Health Economics for Public Affairs. 3 Credits.**

(same as Economics [ECONOM] 7357. This course analyzes the economics of health care in the United States with particular attention to the role of government. It examines the demand for health care and the structure and consequences of public and private health insurance; the supply of health care, including professional training, licensure, speculation and compensation, hospital competition and finance, and the determinants and consequences of technical change in medicine, as well as an examination of recent proposals and initiatives for health care reform. Prerequisites: Public Affairs [PUB\_AF] 8190 or equivalent; graduate standing.

**PUB\_AF 7367. Law and Economics for Public Affairs. 3 Credits.**

(same as Economics [ECONOM] 7367). This course is a survey of economic analysis of American legal institutions. Students will apply basic microeconomic, game theoretic and statistical concepts to the study of property, contracts, torts, the legal process, crime and the judiciary. Prerequisites: Economics [ECONOM] 4351 or 3251 and Statistics [STAT] 2500, or equivalent; graduate standing.

**PUB\_AF 8001. Topics in Public Affairs. 3 Credits.**

Select current topics in public administration. Prerequisite: instructor's consent.

**PUB\_AF 8085. Problems in Public Affairs. 1-99 Credit.**

Intensive study of an area of public administration related to the student's special interest.

**PUB\_AF 8150. Collaborative Governance. 3 Credits.**

Political, economic, and social context of government and public service; examines theories and models of collaborative governance and implications for policy-making, public management, and public service delivery. Graded on A/F basis only.

**PUB\_AF 8160. Organizational Dynamics and Leadership. 3 Credits.**

Focuses on understanding human action in administrative situations and on developing personal capacities for effective action in varied and difficult organizational situations. Graded on A/F basis only.

**PUB\_AF 8170. Public Policy Processes and Strategies. 3 Credits.**

Processes through which public demands are generated, converted into public policy, and implemented. Examines the intersection of politics, policy, and management as well as the diverse strategies and tools of public action. Graded on A/F basis.

**PUB\_AF 8171. Environmental Policy. 3 Credits.**

This course is an introduction to U.S. environmental policy, focusing on important political institutions and political actors. The course provides a survey of the primary laws, regulations, and policies that compromise pollution control and natural resource management policy. Prerequisites: graduates standing or permission of instructor.

**PUB\_AF 8172. Health Policy. 3 Credits.**

This seminar will examine the health care system in the United States, including government funded programs, regulation of costs, and policies promoting health behaviors. The course will examine historical development, recent trends, and methods of health policy analysis. Prerequisite: graduate standing or permission of instructor.

**PUB\_AF 8173. Education Governance, Finance and Policy. 3 Credits.**

The course centers on public policy processes as applied to governance, finance and policy in public education. The administrative, political and economic dimensions of policy reform are emphasized. A special focus is placed on developing tools for analyzing and critiquing policy rational, design and implementation. Prerequisites: graduate standing or permission of instructor.

**PUB\_AF 8174. Social Policy. 3 Credits.**

This seminar will examine the nature and extent of poverty in the U.S., its causes and consequences, and the antipoverty effects of existing and proposed government programs and policies. Prerequisite: graduate standing or permission of instructor.

**PUB\_AF 8175. Early Childhood Policy. 3 Credits.**

This course provides an understanding of early childhood development issues and their impact on policy formation. Will study different family situations in the US and other countries (e.g. maternal employment and job policies, divorce, child abuse and neglect) that may be a concern for child policy makers and analysis. In addition we are going to examine the effects of different early childhood programs in the US and other countries around the world. Also, US federal regulations that have an impact on child policy, such as the National Health Policy and Welfare reform will be examined. Will use both qualitative and quantitative criteria to analyze these policies. This course is applied in focus, so by the end of the semester students should be able to understand policy analysis and the trade-offs of implementing policy choices, as well as being able to develop analytical skills for early childhood and family policies in their work. Graded on A-F basis only.

**PUB\_AF 8180. Research Methods and Inquiry in Public Affairs I. 3 Credits.**

Introduction to research methods for graduate students in public affairs. Topics include measurement, quantitative description, problem definition, the policy research process, and basic analytical tools commonly applied in public affairs. Graded on A/F basis only.

**PUB\_AF 8181. Research Methods and Inquiry in Public Affairs II. 3 Credits.**

Advanced topics and applications in research methods for public affairs. Topics include: multivariate analysis and other advanced quantitative techniques; evaluation of policy research products. Prerequisite: Public Affairs [PUB\_AF] 8190 or permission of instructor.

**PUB\_AF 8185. Research Methods and Inquiry in Public Affairs - Mid Career. 3 Credits.**

Applications in research methods for graduate students in public affairs mid-career program. Topics include: measurement; quantitative description; problem definition; the policy research processes; basic analytical tools commonly applied in public affairs; multivariate analysis and other advanced quantitative techniques; evaluation of policy research products. Prerequisite: instructor's consent. Graded on A/F basis only.

**PUB\_AF 8190. Economic Analysis for Public Affairs. 3 Credits.**

Application of tools of economic analysis to understand and interpret the behavior of government, consumers and producers. Sources of economic inefficiency, including market failures and limitations, and policy solutions. Graded on A/F basis only.

**PUB\_AF 8191. Economic Analysis for Public Policy II. 3 Credits.**

Methods of economic evaluation of public policies, including cost-benefit analysis and cost-effectiveness analysis. Other topics include: discounting, risk, and uncertainty; role of non-economic policy goals in analysis.

**PUB\_AF 8195. Economic Analysis for Public Policy - Mid Career. 3 Credits.**

Application of tools of economic analysis to understand and interpret the behavior of government, consumers and producers. Sources of economic inefficiency, including market failures and limitations, and policy solutions. Prerequisite: instructor's consent.

**PUB\_AF 8210. Ethics, Democracy and the Public Service. 3 Credits.**

Uses the concepts of ethics and democracy to explore the role of public service in American society in the context of globalization. Integrates learning from the MPA core curriculum and the specializations into a comprehensive view of the contemporary, multi-sectored public service. Graded on A/F basis only.

**PUB\_AF 8211. MPA Capstone (Applied Project). 3 Credits.**

Application of concepts and methods of public affairs to actual policy or management problems. Diagnosis of problem or decision situation, collection of relevant data, development of alternative solutions, recommendations of proposed course of action.

**PUB\_AF 8280. Public Affairs Internship. 3 Credits.**

Gives students an opportunity to gain experience in government operations by providing supervised work with an agency at the local, state, or federal level of government or in nonprofit agencies. Graded on A/F basis.

**PUB\_AF 8282. Practicum in Public Affairs. 3-6 Credit.**

Supervised field experience in an approved community, public agency, or nonprofit organizations. Opportunity for observation and participation under the guidance of a qualified advisor. Formal study of advanced

theories and techniques is integrated into the student's experience. Advanced standing and instructor's consent required. Graded on A/F basis.

**PUB\_AF 8310. E-Democracy in Theory and Practice. 3 Credits.**

Examines the theory and practice of electronic democracy. Uses case studies to assess how information and communication technology affects public involvement in public decisions. Major topics include the methods and tools used in current e-democracy projects as well as the philosophical political, practical and institutional issues faced. Graded on A/F basis only.

**PUB\_AF 8320. Spatial Analysis for Public Affairs. 3 Credits.**

Examines theoretical and empirical issues related to the spatial analysis of economic activity and local public issues. Major topics include the role of the public sector, the economics of public services, social accounting matrices, input-output analysis, econometric models of regional economies, and geographic information systems. Graded on A/F basis only.

**PUB\_AF 8330. Informatics and Governance. 3 Credits.**

Provides students with a non-technical introduction to the design, implementation and management of information systems for local and regional governance. Surveys key issues for information professionals, including policy planning, design, procurement, staffing, applications and public access and participation. Graded on A/F basis only.

**PUB\_AF 8340. Regional and Economic Development Policy. 3 Credits.**

Presents an overview of historical perspectives and current practice in regional development policy. Explores various rationales for regional collaboration. Topics include global and political context of development policy, theories of regional growth and development, regional governance, distribution of benefits and sustainable development. Graded on A/F basis only.

**PUB\_AF 8350. Regional Development Issues and Analysis. 3 Credits.**

(same as Agricultural Economics [AG\_EC] 8350). Examines theories of regional growth and development and methods for analysis with applications to current policy issues. Topics include firm location, new economic geography and agglomeration theory, clusters, human capital, migration, social capital, tax and development incentives, and sustainable regional development. Prerequisites: Economics [ECONOM] 7351 or Public Affairs [PUB\_AF] 8190 or equivalent.. Graded on A/F basis only.

**PUB\_AF 8410. Public Policy Workshop. 3 Credits.**

Application of policy analysis tools and methods onto a specific policy topic or problem. Topics vary depending upon interests of the instructor. Prerequisite: Public Affairs [PUB\_AF] 8420 and 8430. Graded on A/F basis only.

**PUB\_AF 8420. Public Program Evaluation. 3 Credits.**

Covers implementation and outcome evaluation models, research design strategies, and data collection methods used to assess the effectiveness of public programs and means of their improvement. Prerequisite: Public Affairs [PUB\_AF] 8181 or equivalent. Graded on A/F basis only.

**PUB\_AF 8430. Public Policy Analysis. 3 Credits.**

Uses economic logic and statistical techniques to design, analyze and evaluate public policy. Applies social choice theory, cost/benefit analysis, forecasting, regression analysis, trend analysis, time series methods, and other analytic techniques to policy decision. Graded on A-

F basis. Prerequisite: PUB\_AF 8181 and PUB\_AF 8190 or equivalent, or permission of instructor.

**PUB\_AF 8510. Public Budgeting and Taxation. 3 Credits.**

Intensive study of the institutions, processes, politics, and social and economic impact of public taxation and expenditures.

**PUB\_AF 8520. Human Resources Mngmnt & Development in Public & Nonprofit Sector. 3 Credits.**

Examines the political, economic, and legal context of the personnel function, as well as the technical aspects of the personnel administrator's job. Stresses the dynamics of bureaucratic organizations. Graded on A/F basis only.

**PUB\_AF 8530. Strategic Management of Public Service Organizations: People, Information and Money. 3 Credits.**

Presents the rationale for strategic planning, and techniques and processes to develop and implement strategic planning in the public sector. Graded on A/F basis only.

**PUB\_AF 8540. Local Government Management. 3 Credits.**

Organization and division of service responsibility within local governments. Problems of managing delivery of services with special emphasis upon program implementation, productivity, planning, responsiveness. Graded on A/F basis.

**PUB\_AF 8610. Group Dynamics and Conflict Resolution. 3 Credits.**

Focuses on the study of group psychology in the context of communities and organizations. It provides a specific examination of the emergence and resolution of conflict. Graded on A/F basis only.

**PUB\_AF 8620. Organizational Analysis and Change. 3 Credits.**

Investigates processes and methodologies of organizational diagnosis, intervention strategies, and the role of a change agent. Graded on A/F basis.

**PUB\_AF 8630. Organizational Change in a Community and Global Context. 3 Credits.**

Examines changing organizations in their task environments, which include communities and the global economy. The phenomenon of ambiguous boundaries between public and private as well as nonprofit sectors will be investigated as these profound changes impact organizational behavior. Graded on A/F basis only.

**PUB\_AF 8710. The Nonprofit and Voluntary Sector. 3 Credits.**

Provides an overview of the history, function, size, scope, development, and management of the nonprofit sector. Historical, political, economic, and social perspectives are used to examine the meaning of voluntarism, charity, philanthropy, and the nonprofit sector. Graded on A/F basis.

**PUB\_AF 8720. Budgeting and Financial Management in the Public and Nonprofit Sector. 3 Credits.**

Nature and environment of public and nonprofit financial administration. Principles of accountability for management of public and nonprofit funds; management and investment of cash balances; special problems related to long- and short-term debt. Graded on A/F basis only.

**PUB\_AF 8830. Grant Writing I. 3 Credits.**

Provides students with knowledge regarding the process of seeking grant funding. Students will work in small groups to complete a letter proposal. They will experience the peer review process both as applicant and reviewer. Graded on A/F basis only.

**PUB\_AF 8831. Grant Writing II. 3 Credits.**

Provides students with knowledge regarding the process of seeking grant funding. Students will work in small groups to complete a full-blown

state or federal grant proposal. They will experience the peer review process both as applicant and reviewer. The course will cover a variety of funding sources and a range of funding types to provide students with an information base for preparing future grant applications. Prerequisite: Public Affairs [PUB\_AF] 8830. Graduate standing required.

**PUB\_AF 8832. Sponsor Relationships. 3 Credits.**

Provides students with knowledge of the landscape and culture of grant seeking with an emphasis on understanding how private and public sector sponsors are in many ways, significantly different enterprises. Students will gain an understanding of the pivotal role relationships play in grant seeking and gain an appreciation of the particularities and rigors of both public and private grant seeking. Prerequisite: Proposed Grant Writing 2 course; graduate standing.

**PUB\_AF 8833. Grant Award Management. 3 Credits.**

Provides students with knowledge regarding the process and policies entailed in managing grant awards. Course content includes federal OMB circulars, basic human resource issues, project management strategies, reporting obligations, and project close-out. Prerequisite: Proposed Grant Writing 2 course; graduate standing.

**PUB\_AF 8850. Policies and Institutions of the European Union. 3 Credits.**

Policies and Institutions of the European Union.

**PUB\_AF 8864. Administrative Law. 3 Credits.**

(same as Law [LAW] 5310). Principles, factors and statutory provisions which govern availability of relief (both judicial and administrative) to persons or entities aggrieved by the actions or inactions of governmental officials or agencies. Graded on A/F basis.

**PUB\_AF 9000. Directed Individual Study. 3 Credits.**

Supervised readings and research in area of doctoral specialization. Student must submit formal written proposal to doctoral supervising faculty member prior to registration. May be repeated up to 6 hours. Prerequisite: PhD standing or permission of instructor.

**PUB\_AF 9090. Dissertation. 1-99 Credit.**

Independent research for Ph.D. dissertation. Prerequisite: PhD standing or permission of instructor. Graded on S/U basis only.

**PUB\_AF 9150. Governance and Public Affairs. 3 Credits.**

Examines theories of governance, the role of the state and other social institutions. Other topics include administrative reform, the new public management, and the emergence of the multi-sector public service. International comparative dimensions emphasized. Prerequisites: Public Affairs [PUB\_AF] 8150, PhD standing or permission of professor. Graded on A/F basis only.

**PUB\_AF 9160. Organization Studies in Public Affairs. 3 Credits.**

Examines theories of public and nonprofit organizations, including classical and contemporary perspectives in organization science; individual and group behavior; leadership, power and influence; organization design and structure; and organizational culture. Prerequisite: PhD standing or permission of instructor. Graded on A/F basis only.

**PUB\_AF 9170. Policy Theory. 3 Credits.**

This seminar examines theories on the policy process, institutions, and delegation of power that influence public policy. Topics covered may include agenda setting, policy design, implementation, legislative decision-making, state political institutions, and federalism. Prerequisite: PhD standing or permission of instructor. Graded on A/F basis only.



**PUB\_AF 9171. Political Economy of Public Affairs. 3 Credits.**

Course focuses on formal theories of public decision-making, collective choice and strategic interaction of public actors in the policy process using tools such as welfare economics, social choice, game theory, logic of collective action, public choice, and principal agent models. Prerequisite: PhD standing or instructor's consent. Graded on A/F basis only.

**PUB\_AF 9180. Advanced Research Methods for Public Affairs I. 3 Credits.**

Focuses on multiple regression analysis, the implications and treatment of serial correlation, heteroskedasticity, multicollinearity, specification error, and measurement error. Students estimate models, use diagnostic information, and interpret and present findings for public affairs. Prerequisites: Public Affairs [PUB\_AF] 8180 or equivalent, PhD standing or permission of instructor. Graded A-F only.

**PUB\_AF 9181. Advanced Research Methods for Public Affairs II. 3 Credits.**

The seminar examines statistical modeling tools for limited dependent variables and complex data situations, such as time-series cross-sectional data, clustered observations, and multilevel data. Other topics include simultaneous equation models and instrument variable in public affairs. Prerequisite: Public Affairs [PUB\_AF] 9180 or equivalent, PhD standing or permission of instructor. Graded A-F only.

**PUB\_AF 9182. Logics of Inquiry in Public Affairs. 3 Credits.**

This course examines the philosophical foundations of social inquiry in public affairs. Topics include investigation of epistemological and methodological issues in development and use of social research, and exploration of the theoretical underpinnings of multiple paradigms in public affairs. Prerequisites: PhD standing or permission of instructor. Graded A-F only.

**PUB\_AF 9183. Public Affairs Research and Professional Development Seminar. 1 Credit.**

Research and professional development through participation in research seminars, colloquia, academic conferences, lectures, and professional workshops. Students required to register every spring semester in residence. Prerequisites: PhD standing or permission of instructor. Graded on S/U basis only.

**PUB\_AF 9185. Supervised Research. 3 Credits.**

Research experience directed by major professor designed to prepare doctoral students for independent scholarship in area of doctoral specialization. Prerequisites: Public Affairs [PUB\_AF] 8150, PhD standing or permission of instructor.

## Public Health (P\_HLTH)

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**P\_HLTH 7001. Topics in Public Health. 3 Credits.**

Selected topics of interest related to Public Health.

**P\_HLTH 7085. Problems in Public Health. 1-99 Credit.**

Guided readings, intensive study of an area in Public Health related to special interest of student or an area in which the student needs to strengthen. Prerequisite: graduate standing; instructor's consent. May be repeated for credit.

**P\_HLTH 7150. Principles of Public Health. 3 Credits.**

This course provides an overview of public health, including concentration areas of public health systems, epidemiology, social and behavioral determinants of health, environmental health, and public health policy.

Case studies from local, state, national and international public health issues are incorporated into each segment, culminating in a discussion of the future of public health.

**P\_HLTH 7160. Interdisciplinary Perspectives in Global Health. 3 Credits.**

This course is designed for those interested in health issues from a global perspective. It explores contemporary issues, problems, and controversies in global health through an interdisciplinary perspective. This course will follow a lecture and case study discussion format. Graded on A/F basis only. Prerequisite: Department consent required.

**P\_HLTH 7750. Physical Function and Older Adults. 3 Credits.**

(Same as Family and Community Medicine [F\_C\_MD] 7750, Architectural Studies [ARCHST] 7640, Health Management and Informatics [HMI] 7750, Human Development and Family Studies [H\_D\_FS] 7750, Nursing [NURSE] 7750, and Social Work [SOC\_WK] 7752). This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graded A-F only. Graduate Standing Required.

**P\_HLTH 7751. Psychosocial Function and Older Adults. 3 Credits.**

(same as Architectural Studies [ARCHST] 7650, Family Community Medicine [F\_C\_MD] 7751, Health Management and Informatics [HMI] 7751, Human Development and Family Studies [H\_D\_FS] 7751, Nursing [NURSE] 7751, Public Health [P\_HLTH], 7751 and Social Work [SOC\_WK] 7751). This course takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**P\_HLTH 7800. Public Health Campaign Successes and Failures. 3 Credits.**

Explains how public health promotion campaigns are planned from assessing health needs and using theoretical models for interventions, to how they are implemented, marketing and strategies, and the benefits and consequences of public health campaigns. Graded on A-F basis only.

**P\_HLTH 7952. Research Methods in Public Health. 3 Credits.**

This course is designed to introduce students to the process of research as a sequence of events, systematically organized to further knowledge. A scientific and conceptual stance to knowledge development is emphasized, along with the importance of the empirical approach in establishing relationships between theories, concepts, and behavior phenomena. Prerequisite: graduate standing. May be repeated for credit.

**P\_HLTH 8001. Topics in Public Health. 1-3 Credit.**

Selected topics of interest related to Public Health.

**P\_HLTH 8085. Problems in Public Health. 1-99 Credit.**

Guided readings, intensive study of an area in Public Health related to special interest of student or an area in which the student needs to strengthen. Prerequisite: graduate standing; instructor's consent. May be repeated for credit.

**P\_HLTH 8090. Masters Thesis Research. 1-99 Credit.**

Leads to preparation of masters thesis. Graded on S/U basis only. Prerequisites: Public Health [P\_HLTH] 8980. Instructor's consent required. Graduate standing required. May only be repeated for credit for six hours.

**P\_HLTH 8150. Human Health and the Environment. 3 Credits.**

This new graduate level course will address threats to public health related to environmental factors including biological, physical and chemical factors. Subjects will include environmental contamination and remediation, zoonotic disease food and water quality.

**P\_HLTH 8250. Equity and Disparities in Health. 3 Credits.**

(Same as Social Work [SOC\_WK] 8250) This course is designed to provide students with knowledge about the distribution, causes, and consequences of health inequalities. The course will examine how multiple predictors such as socioeconomic status, behavioral risk factors, and cultural factors such as perceived discrimination and acculturation, gender and marriage, stigma, and health care inequalities are related with racial/ethnic, socioeconomic, and gender disparities in health. This course will also discuss implications that may contribute substantively toward the elimination of health inequalities. Prerequisite: graduate standing required.

**P\_HLTH 8251. Immigrant Health. 3 Credits.**

Public health professions have considerable interest in understanding the unique health concerns of immigrants, in order to prevent disease, promote health, and prolong life in this specific population and in the population as a whole. This course will be based on readings in the peer-reviewed literature, discussion in a seminar format, community visits and observations/interviews, and guest speakers on topics o importance when considering issues of public health particular to immigrant communities. Prerequisite: instructor's consent. Graded on A/F basis only.

**P\_HLTH 8260. Emergency Preparedness. 3 Credits.**

An overview of current national guidance and basic assessment of the current health care system level of readiness focusing on the critical role of the health care system for community, regional, state, and nationally based emergency preparedness efforts. Graded on A/F basis only.

**P\_HLTH 8400. Clinical Veterinary Regulatory Medicine and Public Health. 2 Credits.**

(same as Veterinary Medicine and Surgery [V\_M\_S] 8400). The goal of this course is to familiarize the student with clinical aspects of veterinary public health/regulatory medicine. Must be enrolled in MPH (veterinary public health concentration) or DVM curriculum.

**P\_HLTH 8420. Principles of Epidemiology. 3 Credits.**

This course is intended to provide a general introduction to the course epidemiological concepts and methods as grounded in the essential services of public health. The focus of the course is on developing critical thinking skills and providing a foundation in applied epidemiologic competencies. May be repeated for credit. Graded on A-F only. Prerequisite: graduate level statistics; instructor's consent.

**P\_HLTH 8620. Emerging Zoonoses Pathogens. 3 Credits.**

This course will enhance student understanding of the epidemiology and ecology of emerging and established zoonotic diseases. Risk factors for emergence of zoonotic diseases will be discussed and principles of zoonotic disease control will be contextually developed. Prerequisites: Family and Community Medicine [F\_C\_MD] 8420 or Veterinary Pathobiology [V\_PBIO] 8455 and Public Health [P\_HLTH] 8150. May be repeated. Graded on A/F basis only.

**P\_HLTH 8920. Social and Behavioral Sciences in Public Health. 3 Credits.**

(same as Psychology [PSYCH] 8920). This course will take both a theoretical and a practical approach to understanding health-related behavior and the field of public health. Students will gain an

understanding of theory and empirical research in the social and behavioral sciences, as well as developing practical skills in critically evaluating research and in applying scientific evidence to address real world health concerns.

**P\_HLTH 8921. Assessment of Population Health and Field Epidemiology. 3 Credits.**

Assessment in public health including outbreak investigation, surveillance, infectious disease, and environmental epidemiology. Prerequisites: Graduate level statistics, basic graduate level epidemiology. Instructor's consent required. Graded on A-F basis only. May be repeated for credit.

**P\_HLTH 8953. Developing and Evaluating Global Public Health Programs. 3 Credits.**

The focus of this course is on the application of research and evidence in the design and implementation of public health programs in developing countries. The intent is to provide an introductory grounding in the development of an evidenced based program from the perspective of the manager. May be repeated for credit. Prerequisite: P\_HLTH 8420 and consent of instructor.

**P\_HLTH 8970. Public Health Capstone. 3 Credits.**

As an integrating experience, the Public Health Capstone will allow students to articulate and share what they have learned in coursework and to supplement previous learning by exploring areas of knowledge the students identify as most relevant to their readiness for professional practice. It will enable students to test theoretical knowledge against real life practical experiences, and to integrate and refine basic and advanced concepts, values, and methods acquired during the professional education. Graduate standing required.

**P\_HLTH 8971. Veterinary Public Health Capstone. 1-99 Credit.**

This capstone experience provides a unique set of opportunities and responsibilities. It is generally scheduled after completion of at least 2 semesters of the MPH curriculum and is designed to serve as a capstone experience integrating previous coursework and experiences. Exceptions to the requirement of completion of 2 semesters of MPH coursework will be granted for students who have completed or concurrent degree. Examples of relevant preparatory coursework will include epidemiology and veterinary public health. As an integrating experience, the capstone will require students to apply knowledge in an independent manner, integrate knowledge into cohesive production, and communication the results of this experience. Prerequisite: completion of at least 2 semester of MPH curriculum.

**P\_HLTH 8980. Public Health Internship. 1-99 Credit.**

The field experience, or internship, is an opportunity for the student to test many of the theories, concepts, and information about public health learned during the first year and translate them into practice. Using the internship site as the "organizational laboratory," the student begins to develop the necessary professional skill sets for becoming a successful public health professional. The current knowledge, skills, abilities, and experiences will continue to develop and grow as each student becomes a life-long learner and practitioner of public health. Graded on S/U basis only.

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## Radiologic Sciences (RA\_SCI)

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**RA\_SCI 1000. Introduction to Radiography. 1 Credit.**

Overview of radiography through small group discussions and onsite visitations in radiology departments. Graded on S/U basis only.

**RA\_SCI 3110. Radiography Procedures I. 2 Credits.**

This course is an introduction to basic radiographic positioning and procedures. Specific radiographic procedures of the chest, upper extremity, shoulder girdle, pelvis and lower extremity are taught. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3120. Fundamentals of Radiography. 3 Credits.**

Orientation to radiology department, ethics, psychodynamics of patient care, medical legal considerations and radiation safety procedures. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3130. Basic Radiographic Skills. 2 Credits.**

Radiographic film processing techniques, intensifying screens and sensitometry will be discussed. The x-ray tube, x-ray production and some of the factors which affect the quantity and quality of the x-ray beam as well as the x-ray image will also be introduced. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3140. Principles in Radiographic Exposure I. 3 Credits.**

Theory and principles of X-ray technique; correlation of factors with application. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3150. Radiologic Pharmacology. 3 Credits.**

Pharmacological principles, biopharmaceutics, pharmacokinetics, pharmacodynamics, drug classifications, drug names, administration routes, and infection prevention and control will be covered. Attention will be given to contrast agents relative to radiographic imaging. Ethical and legal implications will be explored. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3160. Radiologic Physics. 3 Credits.**

Fundamental physics of electricity and radiant energy; principles of generation of electromagnetic radiation and applicable equipment; and principles of digital image capture, display and storage. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3170. Imaging Modalities. 2 Credits.**

The study of radiographic and fluoroscopic equipment with attention to automatic exposure devices, image intensification, and imaging detectors. Consideration will be given to equipment in such modalities as computed tomography, magnetic resonance imaging, ultrasound, nuclear medicine and radiation therapy. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3180. Radiography Procedures II. 2 Credits.**

Instruction in radiographic procedures of the upper and lower gastrointestinal system, urinary system, bony thorax, vertebral column, and cranium. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3190. Radiography Procedures III. 3 Credits.**

Instructions in advanced radiographic imaging techniques with emphasis in trauma radiography, vascular studies and other speciality radiographic procedures. Prerequisites: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3460. Cardiovascular and Pulmonary Diagnostic Applications I. 3 Credits.**

(same as Cardiopulmonary and Diagnostic Science [CPD] 3460). Problem-based study of cardiopulmonary anatomy and physiology using current imaging methods. Emphasis given to assessment of the acutely distressed cardiac or pulmonary subject, emergency pulmonary support and vascular access techniques. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program.

**RA\_SCI 3941. Clinical Education I. 3 Credits.**

First in a five-part series focusing on the application and evaluation of radiography in the clinical setting. Supervised clinical experience emphasizing radiographic procedures of the chest, abdomen, and extremities. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 3942. Clinical Education II. 3 Credits.**

Second in a five-part series focusing on the application and evaluation of radiography in the clinical setting. Supervised clinical experience emphasizing the development of technical skills and procedural knowledge of routine radiographic procedures. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 4085. Problems in Medical Imaging. 1-3 Credit.**

Supervise investigation in an aspect of medical imaging science usually culminating in a written report. Prerequisite: instructor's consent.

**RA\_SCI 4110. Sectional Anatomy. 3 Credits.**

(same as Diagnostic Medical Ultrasound [DMU] 4312/7312). A study of human anatomy using the sectional approach; anatomical structures will be related to modern medical imaging techniques. Prerequisite: instructor's consent.

**RA\_SCI 4140. Magnetic Resonance Imaging: Physics and Procedures. 5 Credits.**

Magnetic Resonance imaging fundamentals, applications, instrumentation, physical principles. Basic imaging concepts including positioning, scanning protocols, contrast imaging, anatomy review, and pathological considerations. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program.

**RA\_SCI 4150. Computed Tomography: Physics and Procedures. 5 Credits.**

Computed tomography imaging fundamentals, applications, instrumentation, physical principles. Applied concepts regarding patient care and CT imaging procedures. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program.

**RA\_SCI 4303. Radiation Safety. 3 Credits.**

(same as Nuclear Science and Engineering [NU\_ENG] 4303/7303) Types and origins of radiation; radiation detection and measurement; radiation interactions; shielding; dose calculations; federal, state and local regulations; and procedures for safe uses of radiation. Laboratory experiments in radiation measurements and protection.

**RA\_SCI 4440. Organization and Administration. 3 Credits.**

(same as Respiratory Therapy [RS\_THR] 4440 and Cardiopulmonary and Diagnostic Science [CPD] 4440). Examines design and operation of allied health service departments and educational programs, including facilities, personnel procedures, record systems, ethics, medical-legal aspects, interdepartmental relations and curriculum development.

**RA\_SCI 4943. Clinical Education III. 3 Credits.**

Third in a five-part series focusing on the application and evaluation of radiography in the clinical setting. Supervised clinical experience emphasizing the transition to self-directed practice of routine radiographic procedures and the development of technical skills and procedural knowledge of more advanced radiographic procedures. Prerequisite: Acceptance into Radiologic Science, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 4944. Clinical Education IV. 3 Credits.**

Fourth in a five-part series focusing on the application and evaluation of radiography in the clinical setting. Supervised clinical experience emphasizing self-directed clinical practice and the development of technical skills and procedural knowledge of more advanced radiographic procedures and modalities. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Science students only.

**RA\_SCI 4945. Clinical Education V. 3 Credits.**

Final clinical course. Supervised clinical experience emphasizing self-directed performance of complex radiographic procedures, continued competency in routine diagnostic radiography and the investigation of advanced modalities, while transitioning to reflective, critical, and strategic professional practice. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program. Restricted to Radiologic Sciences students only.

**RA\_SCI 4946. Advanced Medical Imaging Externship. 3 Credits.**

Supervised clinical experience in a medical imaging specialty with emphasis on patient care and technical practice. Prerequisite: Acceptance into Radiologic Sciences; instructor's consent. Restricted to Radiologic Science students only.

**RA\_SCI 4947. Radiography Overview. 3 Credits.**

A comprehensive overview of all aspects of diagnostic radiology with emphasis on procedures, technique, radiation protection, positioning, radiographic anatomy and patient care. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program.

**RA\_SCI 4980. Imaging Pathology. 3 Credits.**

Etiology and processes of disease. Emphasis on pathology of body systems and the manifestation of pathology through imaging. Prerequisite: Acceptance into Radiologic Sciences, Radiography Program.

**RA\_SCI 7303. RADIATION SAFETY. 3 Credits.**

RADIATION SAFETY.

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## Radiology (RADIOL)

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**RADIOL 4328. Introductory Radiation Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] 4328, Nuclear Engineering [NU\_ENG] 4328, Veterinary Medicine and Surgery [V\_M\_S] 7328). Concepts of ionizing radiations, their actions on matter through effects on simple chemical systems, biological molecules, cell, organisms, man. Prerequisite: junior standing Sciences/Engineering; one course in Biological Sciences and Physics/Chemistry; or instructor's consent.

**RADIOL 6371. ABS Radiology Mechanism of Disease. 5-10 Credit.**

ABS Radiology Mechanism of Disease.

**RADIOL 6373. ABS Radiology Research. 5-10 Credit.**

ABS Radiology Research.

**RADIOL 6375. ABS Radiology Research and Review. 5-10 Credit.**

ABS Radiology Research and Review.

**RADIOL 6645. Radiology. 5 Credits.**

Goals/Objectives: General survey of all subspecialties of radiology. Evaluations: Written evaluations performed by both faculty and residents.

**RADIOL 6650. Advanced Radiology. 5 Credits.**

Advanced Radiology.

**RADIOL 6745. Radiology - Rural. 5 Credits.**

Radiology - Rural.

**RADIOL 7328. Introductory Radiation Biology. 3 Credits.**

(same as Biological Sciences [BIO\_SC] , Nuclear Engineering [NU\_ENG] , Veterinary Medicine and Surgery [V\_M\_S] 7328). Concepts of ionizing radiations, their actions on matter through effects on simple chemical systems, biological molecules, cell, organisms, man. Prerequisite: graduate standing Sciences/Engineering; one course in Biological Sciences and Physics/Chemistry; or instructor's consent.

**RADIOL 8085. Problems in Radiology. 1-3 Credit.**

Supervised investigation in an aspect of radiological science usually culminating in a written report.

**RADIOL 8090. Problems in Radiology. 1-3 Credit.**

Supervised investigation in an aspect of radiological science usually culminating in a written report.

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## Religious Studies (REL\_ST)

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**REL\_ST 1100. Introduction to Religion. 3 Credits.**

Engages students in reflection on the religious questions that human existence poses, and introduces them to conceptual tools for understanding and evaluating answers which have emerged in human history. Restricted to Freshmen and Sophomores only.

**REL\_ST 1100H. Introduction to Religion - Honors. 3 Credits.**

Engages students in reflection on the religious questions that human existence poses, and introduces them to conceptual tools for understanding and evaluating answers which have emerged in human history. Honors eligibility required.

**REL\_ST 1500. Religion and Culture. 3 Credits.**

The study of religion as expressed in art, literature, music, dance, drama, architecture. Restricted to Freshmen and Sophomores only.

**REL\_ST 1820. Asian Humanities. 3 Credits.**

(same as Art History and Archeology [AR\_H\_A] 1230, History [HIST] 1820, South Asian Studies [S\_A\_ST] 1152). This course is an introduction to the literature and visual arts of Asia through selected master works. It focuses principally on India and China and investigates the distinctive features of their cultures.

**REL\_ST 1820H. Asian Humanities - Honors. 3 Credits.**

(same as Art History and Archeology [A\_R\_HA] 1230, History [HIST] 1820, South Asian Studies [S\_A\_ST] 1152). This course is an introduction to the literature and visual arts of Asia through selected master works. It focuses principally on India and China and investigates the distinctive features of their cultures.

**REL\_ST 2001. Topics in Religious Studies-General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 2005. Topics in Religious Studies-Humanities. 1-3 Credit.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 2100. Indigenous Religions. 3 Credits.**

(same as Anthropology [ANTHRO] 2100). Explores the central aspects of religious life in indigenous communities. Focusing on specific groups, it considers individual and group identity, the meaning of the sacred, and the impact of foreign domination. 2100H same as 2100 with the addition of Honors eligibility required.

**REL\_ST 2100H. Indigenous Religions - Honors. 3 Credits.**

(same as Anthropology [ANTHRO] 2100H). Explores the central aspects of religious life in indigenous communities. Focusing on specific native communities, it considers individual and group identity and the meaning of the sacred. Honors eligibility required.

**REL\_ST 2110. Religions of the World. 3 Credits.**

This course introduces students to a variety of religious traditions through the study of their myths, rituals, beliefs, and practices, and explores approaches to the academic study of religion.

**REL\_ST 2110H. Major World Religions - Honors. 3 Credits.**

Explores the differing ways in which Asian and Western religions interpret life and reality. Includes study of Hinduism, Buddhism, Chinese and Japanese religions, Judaism, Christianity, and Islam. Honors eligibility required.

**REL\_ST 2230. Religion and Popular Culture in the U.S.. 3 Credits.**

Explores intersections of religion and popular culture and methods for analysis.

**REL\_ST 2240. Harry Potter, Magic, and Religion. 3 Credits.**

This course explores religious themes in J.K. Rowling's Harry Potter series. Topics include ancient Greek, Roman, Celtic, and Norse mythological themes, the relationship between religion and magic, and reactions to the books among various religious groups.

**REL\_ST 2250. Religious Perspectives on Peace and War. 3 Credits.**

This course explores religious justification for war as well as religious perspectives on peacemaking. We engage these issues through the investigation of a variety of religious leaders and traditions, drawing from contemporary and historical examples. Traditions studied can include Jewish, Christians, Buddhist, Hindu, Islamic, and indigenous illustrations.

**REL\_ST 2270. Religion and Literature. 3 Credits.**

This course explores religious themes such as myth, rituals and rites, sacred power, transcendence, salvation, and pilgrimage in secular literature. Selections in English, include novels and short stories from a variety of cultures and religious traditions.

**REL\_ST 2270H. Modern Literature and the Quest for Values - Honors. 3 Credits.**

This course is an interdisciplinary study of the religious and ethical questions, quests, and solutions in the literary works of selected modern writers: Beckett, Eliot, Camus, Kazantzakis, O'Connor, Updike, Wiesel, Percy and Morrison. Honors eligibility required.

**REL\_ST 2280. Biblical Themes in American Literature. 3 Credits.**

This course is a study of the reinterpretation of Hebrew scriptures and New Testament sources in classic American texts. The works of Melville, Faulkner, MacLeish, Baldwin, O'Connor, Updike, Percy, and Morrison create a history of certain American ideas as they transform traditional biblical figures and ideas.

**REL\_ST 2280H. Biblical Themes in American Literature - Honors. 3 Credits.**

A study of the sources in the Hebrew Scriptures and the New Testament and their reinterpretation in classic American texts. Such a study, initially textual, results in a history of American ideas. Authors studied include MacLeish, Baldwin, O'Connor, Updike, Percy and Morrison. Honors eligibility required.

**REL\_ST 2310. Religions of China and Japan. 3 Credits.**

Introduction to the religions of East Asia, focusing on both popular beliefs and institutionalized religion. Topics include: Buddhist, Confucian, and Daoist traditions of China; Buddhism and Shinto in Japan; self-cultivation practices; spirit mediumship; ritual; cosmology; religion and society; religion and the state.

**REL\_ST 2310H. Religions of China and Japan - Honors. 3 Credits.**

Introduction to the religions of East Asia, focusing on both popular beliefs and institutionalized religion. Topics include: Buddhist, Confucian, and Daoist traditions of China; Buddhism and Shinto in Japan; self-cultivation practices; spirit mediumship; ritual; cosmology; religion and society; religion and the state. Honors eligibility required.

**REL\_ST 2400. Judaism. 3 Credits.**

A comprehensive introduction to Judaism: an overview of Jewish philosophy and theology, rituals and customs.

**REL\_ST 2410. Essential Stories of the Torah. 3 Credits.**

Students will examine major narratives and texts from the Pentateuch section of Hebrew Bible. This class will present such ancient, medieval, and contemporary interpretations that will demonstrate how biblical texts could be construed in more than one way.

**REL\_ST 2450. The Holocaust and Reflections on Genocide. 3 Credits.**

Examines the nature of genocide as an historical phenomenon using the Holocaust as the primary case study.

**REL\_ST 2500. Introduction to Hebrew Bible/Old Testament. 3 Credits.**

An introduction to the literature, history, institutions, and thought contained in the Hebrew Bible and to the methods and principles necessary for the scholarly study of scripture.

**REL\_ST 2500H. Introduction to Hebrew Bible/Old Testament - Honors. 3 Credits.**

An introduction to the literature, history, institutions, and thought contained in the Hebrew Bible and to the methods and principles necessary for the scholarly study of scripture. Honors eligibility required.

**REL\_ST 2510. Introduction to the New Testament. 3 Credits.**

An introduction to the literature of the New Testament and the methods and principles guiding its interpretation, with particular mention to its structure, thought, and historical setting.

**REL\_ST 2510H. Introduction to the New Testament - Honors. 3 Credits.**

An introduction to the literature of the New Testament and the methods and principles guiding its interpretation, with particular mention to its structure, thought, and historical setting. Honors eligibility required.

**REL\_ST 2600. Early Christianity. 3 Credits.**

(same as History [HIST] 2600). History of Christian practices and teachings from Christian origins through the 8th century, including Eastern Orthodoxy Syrian Christianity, Roman Catholicism. Themes such as interpretation and creation of Scriptures, worship style, central rituals,

debates about right teaching (orthodoxy) mysticism and developing lifestyles both in and apart from the world.

**REL\_ST 2600H. Early Christianity - Honors. 3 Credits.**

(same as History [HIST] 2600). History of Christian practices and teachings from Christian origins through the 8th century, including Eastern Orthodox Syrian Christianity, Roman Catholicism. Themes such as interpretation and creation of Scriptures, worship style, central rituals, debates about right teaching (orthodoxy) mysticism and developing lifestyles both in and apart from the world. Honors eligibility required.

**REL\_ST 2610. Medieval Christianity. 3 Credits.**

(same as History [HIST] 2610). History of Christian practices and teachings from the 5th-15th centuries, including Byzantine and Western Christianity Themes such as the influence of the Islamic world on Christianity, popular and elite formulations of theology and ritual activities.

**REL\_ST 2610H. Medieval Christianity - Honors. 3 Credits.**

(same as History [HIST] 2610). History of Christian practices and teachings from the 5th-15th centuries, including Byzantine and Western Christianity Themes such as the influence of the Islamic world on Christianity, popular and elite formulations of theology and ritual activities. Honors eligibility required.

**REL\_ST 2620. History of Christianity, 1500-Present. 3 Credits.**

(same as History [HIST] 2620). History of Christian practices and teachings from the 15th - 21st centuries, including global dimensions of Orthodox, Catholic, Protestant and other forms of Christianity. Themes such as right teaching and practice, indigenous-Christian contact, mission and expansion, impact of secular theories, contemporary debates.

**REL\_ST 2620H. History of Christianity, 1500-Present - Honors. 3 Credits.**

(same as History [HIST] 2620). History of Christian practices and teachings from the 15th - 21st centuries, including global dimensions of Orthodox, Catholic, Protestant and other forms of Christianity. Themes such as right teaching and practice, indigenous-Christian contact, mission and expansion, impact of secular theories, contemporary debates. Honors eligibility required.

**REL\_ST 2630. History of Christian Traditions. 3 Credits.**

(same as HIST 2630). An overview of the origins and development of Christianities from the first century of the Common Era to the present day. Topic will include competing Christian theologies, colonialism, conversion narratives, globalization, religious violence, and heresy. May be repeated for credit.

**REL\_ST 2700. Islam. 3 Credits.**

Examines the historical development of Islamic traditions, noting the manner in which various sects & factions understand religion, humanity and God.

**REL\_ST 2900. Contemporary Religious Thought. 3 Credits.**

Explores issues within contemporary Christian theology that cut across denominational lines such as: the nature and existence of God; secularization, relativism, and humanism; the authority of the Bible; attitudes toward other religions; the moral integrity of Christianity; and the purpose of human existence.

**REL\_ST 2910. Religion and Contemporary Social Issues. 3 Credits.**

Study of the social ethics of Jewish and Christian theologians and movements of the 19th and 20th centuries and an examination of selected social problems in light of these systems.

**REL\_ST 2920. Images of Good and Evil. 3 Credits.**

Study of the symbols and myths which explore the nature and power of good and evil. Includes examination of the music, art and literature of both ancient and contemporary religions.

**REL\_ST 2930. Religion and Psychological Perspectives. 3 Credits.**

Examines how religion is understood from various psychological perspectives, and how psychological theories reflect religious presuppositions about the nature and purpose of human life.

**REL\_ST 2939. Religion and Human Sexuality. 3 Credits.**

Examines attitudes within the Christian tradition toward sexuality, with particular reference to the alternatives of patriarchy and feminism, especially as they consider issues such as the meaning of bodiliness, masturbation, pornography, prostitution, homosexuality and sexual pluralism.

**REL\_ST 2950. Directed Readings in Religious Studies. 3 Credits.**

Independent readings selected in consultation with supervisory faculty member. May not be repeated. Prerequisite: instructor's consent.

**REL\_ST 3000. History of Religion in America to the Civil War. 3 Credits.**

(same as History [HIST] 3000). Surveys major American religious traditions, patterns, and themes from 1492 to the Civil War, especially the role of religion in American social, cultural, and political developments. Prerequisite: sophomore standing or instructor's consent.

**REL\_ST 3000H. History of Religion in America to the Civil War - Honors. 3 Credits.**

(same as History [HIST] 3000). Surveys major American religious traditions, patterns, and themes from 1492 to the Civil War, especially the role of religion in American social, cultural, and political developments. Prerequisite: sophomore standing or instructor's consent. Honors eligibility required.

**REL\_ST 3001. Topics in Religious Studies-General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 3005. Topics in Religious Studies-Humanities. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 3100. Religious Literacy for the Public and Professions. 3 Credits.**

This course teaches students to engage and encounter religion in day-to-day life and in the professional workplace. Its primary goal is to examine religious diversity in private and professional contexts from a practical standpoint by examining a variety of case studies.

**REL\_ST 3200. Hinduism. 3 Credits.**

(same as South Asia Studies [S\_A\_ST] 3200). Origin and development of central themes of traditional Hinduism from earliest times to the modern period. Topics include: the Vedic tradition, rituals and practice, varieties of yoga, and meditation, Indian religious thought, and devotional Hinduism.

**REL\_ST 3210. History of Religion in Post-Civil War America. 3 Credits.**

(same as History [HIST] 3210). Surveys major American religious traditions, patterns, and themes from 1865 to the present, especially the role of religion in American social, cultural and political developments.

**REL\_ST 3210H. History of Religion in Post-Civil War America - Honors. 3 Credits.**

(same as History [HIST] 3210). Surveys major American religious traditions, patterns, and themes from 1865 to the present, especially the role of religion in American social, cultural and political developments. Prerequisite: sophomore standing or instructor's consent. Honors Eligibility Required.

**REL\_ST 3230. Buddhism and Environmental Ethics. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 3230). Global environmental crisis is associated with rapidly expanding human population. Buddhist teachings about the interdependent aspects of existence and interrelatedness of all life may provide critical insights for how humanity can achieve balance and reciprocity with nature.

**REL\_ST 3240. Buddhism of South and Southeast Asia. 3 Credits.**

(same as South Asian Studies 3240). Examines the origins of Buddhism in India, the narratives of the life of the Buddha, the development of early Buddhist schools, the extension of Buddhism into Central and Southeast Asia, and the current practice of Buddhism in South and Southeast Asia.

**REL\_ST 3250. Buddhism in East Asia. 3 Credits.**

This course will trace the transmission of Buddhism from the Indian subcontinent to China, and from there to Korea and Japan. We will examine the historical development of East Asian forms of Buddhism, deal with key issues of Buddhist thought and practice, and look at the role of Buddhism in modern East Asian societies. Prerequisites: Religious Studies [REL\_ST] 2110, 2300, 2310 or 3200, or instructor's consent.

**REL\_ST 3260. Hindu Goddesses. 3 Credits.**

This course examines the vast range of Hindu Goddesses and their worship in South Asia. It includes information about goddess origins, mythology, symbolism, and attendant ritual practices. In order to approach this topic, background information about the history of Hinduism, major religious narratives, devotional practices, and iconographic representations of the divine are discussed. The course introduces the approaches of various scholars to Hindu Goddess worship within the context of religion, social relations, and gender roles, and explores ways in which South Asian women experience and negotiate feminine power in contemporary socio-cultural contexts.

**REL\_ST 3280. Chinese Popular Religion. 3 Credits.**

Starting with a consideration of conceptual issues (what is 'popular religion?'), the course will give a survey of the beliefs and practices of Chinese popular religion, including ancestor worship, territorial cults, spirit-mediumism, divination, and popular sects.

**REL\_ST 3300. The Prophets. 3 Credits.**

Study of the prophetic writings of the Hebrew Scriptures, with consideration of the origin and nature of Israelite prophecy. Includes the narratives of the period of prophetic activity and study of the classical prophets.

**REL\_ST 3310. The Problem of Evil: Theodicy in the Ancient Near East. 3 Credits.**

Detailed interpretation of the Psalms, Proverbs and related writings of the broad wisdom tradition, with critical attention to the literary style and structure of the writings.

**REL\_ST 3380. Native American Religions. 3 Credits.**

(same as Anthropology [ANTHRO] 3380). Investigation of religious lives of the native peoples of the Americas through cultural contact with modernity. Perspectives based on historical, anthropological and native texts.

**REL\_ST 3380H. Native American Religions - Honors. 3 Credits.**

(same as Anthropology [ANTHRO] 3380H). Investigation of religious lives of the native peoples of the Americas through cultural contact with modernity. Perspectives based on historical, anthropological and native texts. Honors eligibility required.

**REL\_ST 3400. The Gospels of Matthew, Mark, and Luke. 3 Credits.**

Examination of the Gospels of Matthew, Mark, and Luke as single works and as literarily related compositions. Interpretation focuses on the literary form of passages and the theological and ethical themes expressed.

**REL\_ST 3400H. The Gospels of Matthew, Mark, and Luke - Honors. 3 Credits.**

Examination of the Gospels of Matthew, Mark, and Luke as single works and as literarily related compositions. Interpretation focuses on the literary form of passages and the theological and ethical themes expressed. Honors eligibility required.

**REL\_ST 3410. Life and Letters of Paul. 3 Credits.**

Reconstruction of the life and letters of the Apostle Paul; examination of his thought in relation to Jesus of Nazareth and to earliest Christianity.

**REL\_ST 3410H. Life and Letters of Paul - Honors. 3 Credits.**

Reconstruction of the life and letters of the Apostle Paul; examination of his thought in relation to Jesus of Nazareth and to earliest Christianity. Honors eligibility required.

**REL\_ST 3420. Jesus in Myth, Tradition and History. 3 Credits.**

This course will explore the identity and character of Jesus of Nazareth as depicted in various early Christian canonical and non-canonical sources and, using a variety of scholarly techniques, ascertain what information in those sources can be considered to describe accurately the real, historical Jesus.

**REL\_ST 3430H. Revelation and Apocalyptic Literature - Honors. 3 Credits.**

A study of Jewish and Christian apocalyptic literature with an emphasis on the Revelation to St. John. Honors eligibility required.

**REL\_ST 3445. The Body in Western Christianity. 3 Credits.**

This course is a survey of Western Christian Perspectives of the human body ranging from the Early Church Fathers to trends in contemporary American culture.

**REL\_ST 3451. Religion in Science Fiction. 3 Credits.**

Investigation of religious themes in science fiction novels, short stories and films. Themes include the nature of the sacred, the limits of human knowledge, understanding and experiencing transcendence, revelation and apocalypse.

**REL\_ST 3500. Judaism in the Time of Jesus. 3 Credits.**

This course is an introduction to the origin and development of Judaism from the time of the destruction of the first Jerusalem temple (587 BCE) to the Bar Kochba revolt (132-135 CE).

**REL\_ST 3530. Rabbinic Judaism: Perspective and Literature. 3 Credits.**

Overview of the Jewish oral tradition during the Rabbinic era. The information covered in this course will focus upon the vast literature created during the Mishnaic and Talmudic periods and the emerging new styles and directions of Jewish religious thought.

**REL\_ST 3540. Jewish-Christian Relations. 3 Credits.**

Explores historical and contemporary relations between Christians and Jews, and the transformations in Christian thought and practice resulting

from awareness of Christianity's role in the Holocaust and from post-Holocaust dialogues between Jews and Christians.

**REL\_ST 3600. Spirituality. 3 Credits.**

Comparative investigation of selected mystical writings from Western religious traditions; consideration of contemporary psychological, philosophical, and phenomenological interpretations of mystical experience.

**REL\_ST 3700. Modern Religious Thought. 3 Credits.**

Examination of the theological systems of major Christian thinkers and movements of the 19th and 20th centuries in relation to historic religious traditions and modern cultural challenges. Prerequisite: sophomore standing, and one course in Philosophy, or instructor's consent.

**REL\_ST 3710. Reality of God. 3 Credits.**

Will explore the meaning of "the loss of God" (Tillich) and various modern and contemporary attempts to reaffirm the reality of God.

**REL\_ST 3740. Religion and Film. 3 Credits.**

Addresses issues of interpretation and analysis in the convergence of religion and film. Addresses three areas under this broad rubric: 1) film representations of established religions; 2) film and the construction of social values; 3) film as contemporary "myth". Treating films as social texts, we will ask what such representations of ourselves to ourselves suggest about culture in general.

**REL\_ST 3750. Women and Religions. 3 Credits.**

(same as Women's and Gender Studies [WGST] 3750). A rediscovery of the wealth of religious activity which women have created and enacted. Investigates women's roles and rituals in large-scale and local religions, including ancient Goddess religions, Hinduism, Buddhism, Judaism, Christianity, Islam, and African, South American, and native American groups. Prerequisite: sophomore standing.

**REL\_ST 3760. Geography of the World's Religions. 3 Credits.**

(same as Geography [GEOG] 3760). Explores the significance of place in the origin, diffusion, distribution and practice of religions, emphasizing imprints of religion on the cultural landscape and connections between culture, politics, economics, and religion. Prerequisite: 1000/2000 level Geography course; junior standing or instructor's consent.

**REL\_ST 3800. Religion in America Today. 3 Credits.**

Explores in depth a few selected issues currently shaping or being shaped by religion in the United States. Specific topics will be chosen from events conflicts, developments, or news items within the last five years. Prerequisite: sophomore standing. Graded on A/F basis only.

**REL\_ST 3820. Religion and Law in America. 3 Credits.**

This class explores how the U.S. legal system is navigating an increasing diversity of religious traditions. Course examines the place of religious values and the ongoing tension between religion and law in the legal system of the U.S. through a variety of controversial topics.

**REL\_ST 3990. Majors Seminar. 3 Credits.**

In this seminar religious studies majors will be encouraged to form a community of inquiry focused on the subject of religion and public life. Prerequisite: Religious Studies majors in their junior year.

**REL\_ST 4001. Topics in Religious Studies-General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration. Prerequisite: junior standing or instructor's consent.

**REL\_ST 4005. Topics in Religious Studies-General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 4100. Advanced Theories and Methods. 3 Credits.**

The course investigates the history of the modern academic study of religion, closely exploring influential theories and methods that have shaped scholarly perspective. May include approaches such as structuralism, phenomenology, Durkheimian and Weberian sociology, Marxism, feminism, thick description, psychoanalysis, and others. Limited to Religious Studies majors and MA students.

**REL\_ST 4110. Religious Myth and Ritual. 3 Credits.**

This course will unpack theoretical and methodological issues surrounding the study of embodied religious practice and the nature of religious narrative using myths and rituals from around the world's religious traditions.

**REL\_ST 4120. Studies in Ritual. 3 Credits.**

Exploration of particular themes of religious expression in seasonal, calendric and life-cycle rituals and in personal and public ceremonies. Includes comparisons of indigenous communities and modern society.

**REL\_ST 4130. Haunting and Healing. 3 Credits.**

This course explores instances, stories, and representations of haunting in the United States. We apply a variety of theoretical and methodological approaches to illuminate the diversity of meanings, functions, and contexts of supernatural beings in American popular and folk cultures.

**REL\_ST 4150. Religion, Spirituality, and the Brain. 3 Credits.**

Explores neuropsychology of religion, spirituality, transcendence, and mystical experience. Covers development in neuroscience about how the brain works in a variety of religious and spiritual contexts, including prayer, meditation, and altered states of consciousness.

**REL\_ST 4200. Survey of West African and African Diasporic Religions. 3 Credits.**

Explores indigenous African religions and Islam in West Africa, as well as the development of African American Christianity and African diasporic religions in the Americas.

**REL\_ST 4210. African-American Religion. 3 Credits.**

(same as Black Studies [BL\_STU] 4210). Historical and thematic examination of African American religious traditions and practices. Addresses intersections of religious expression with race, identity, culture, and society.

**REL\_ST 4280. Archaeology of Religion. 3 Credits.**

(same as Anthropology [ANTHRO] 4280). This course examines how anthropologists conceptualize religious behavior, and how archaeologist use material remains to examine past religious behavior, rituals, religious practitioners, cosmological constructs, worldview and ideology in the Americas. Prerequisite: Anthropology [ANTHRO] 2020 and/or Religious Studies [REL\_ST] 2100.

**REL\_ST 4300. Religious Narratives of South Asia. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 4300). Study of major narratives of India and their interpretation in literature and art. Topics include: Vedic and Epic mythology, stories of Krishna, myths and images of Shiva, and forms of the Goddess.

**REL\_ST 4310. The Confucian Tradition: Past and Present. 3 Credits.**

Investigates Confucianism as the dominant religio-philosophical tradition of China and its impact on Korea and Japan. We will study basic Confucian canonical texts, follow its historical development, look at its



interactions with other religions, and discuss the continuing relevance of the Confucian tradition in modern East Asia.

**REL\_ST 4320. Introduction to Daoism. 3 Credits.**

An introduction to the Daoist religious tradition, beginning with its background in earlier forms of philosophy, ritual, and belief. We will follow the development of the various Daoist schools and movements over the centuries and examine key aspects of their belief and practice, both historical and contemporary.

**REL\_ST 4380. Anthropological Theories of Religion. 3 Credits.**

(same as Anthropology [ANTHRO] 4380). Course provides a critical evaluation of anthropological explanations of various forms of traditional religious behavior such as magic, shamanism, divination, ritual, mythology, and witchcraft. The anthropological explanations examined range from nineteenth century classics to the current approaches of today. Prerequisites: Anthropology [ANTHRO] 2030, ANTHRO/ Religious Studies [REL\_ST] 2100, or instructor's consent.

**REL\_ST 4400. The Catholic Intellectual Tradition. 3 Credits.**

Students will read the great thinkers of the Catholic church such as Augustine, Abelard, Bernard of Clairvaux, Aquinas, Bonaventure, Nicholas of Cusa, Pascal, Newman, Maritain, Rahner, Johnson, Tracy. The theme examined may vary from year to year.

**REL\_ST 4410. Major Religious Thinkers. 3 Credits.**

Concentrated study of one or more selected theologians, such as Augustine, Aquinas, Luther, Calvin, Buber, Tillich, and Rahner.

**REL\_ST 4418. Religion Reporting and Writing. 3 Credits.**

(same as Journalism [JOURN] 4426). Advanced seminar in religion reporting and writing. Examines the role of religion journalism in faith, public life, and culture. Prerequisite: JOURN 4450 professional writing experience and instructor's consent.

**REL\_ST 4500. Greek and Roman Religion. 3 Credits.**

(same as Classical Humanities [CL\_HUM] 4500). Survey of religious development among the Greeks and Romans. Prerequisite: sophomore standing and CL\_HUM 1060, Art History and Archaeology [AR\_H\_A] 1110 or History [HIST] 1520.

**REL\_ST 4550. The Historical Jesus. 3 Credits.**

This course examines theory, method, and conclusions in recent Jesus scholarship. Attention is also paid to the historical and cultural context in which Jesus research becomes prominent.

**REL\_ST 4630. Sanskrit I. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 4350). This intensive course will cover the essentials of Sanskrit grammar in one semester and prepare students for further readings in Hindu and Buddhist literature.

**REL\_ST 4640. Sanskrit II. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 4640). This course is intended as a "sampler" of Sanskrit literature. We will read Sanskrit texts in the original. The objectives of the course are 1) Expanding the students' knowledge of the Sanskrit language, 2) To acquaint the students with a broad range of textual genres in Sanskrit literature, and 3) To acquaint the students with some central ideas of Hindu and Buddhist philosophy.

**REL\_ST 4750. Women, Religion and Culture. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4750). An advanced study of the role of women in religion, focusing on the methods of determining the significance of gender in religious life, sacred texts, symbols, rituals and/or beliefs. Traditions studied include Christianity, Islam, contemporary pagan communities, and Native American traditions.

**REL\_ST 4960. Directed Readings in Religious Studies. 1-6 Credit.**

Independent readings selected in consultation with supervisory faculty member. May be repeated up to 6 hrs. Prerequisite: instructor's consent.

**REL\_ST 4990. Senior Seminar in Religious Studies. 3 Credits.**

A seminar in which Religious Studies majors use methods of understanding and comparing religions by focusing on times and places of significant contact among peoples of different religions.

**REL\_ST 7001. Topics in Religious Studies-General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 7005. Topics in Religious Studies - General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 7110. Religious Myth and Ritual. 3 Credits.**

Comparative analysis of religious mythologies and symbolism as well as the ritual systems associated with those mythologies. Prerequisite: graduate standing and instructor's consent.

**REL\_ST 7120. Studies in Ritual. 3 Credits.**

Exploration of particular themes of religious expression in seasonal, calendric and life-cycle rituals and in personal and public ceremonies. Includes comparisons of indigenous communities and modern society. Prerequisite: graduate standing or instructor's consent.

**REL\_ST 7150. Religion, Spirituality, and the Brain. 3 Credits.**

Explores neuropsychology of religion, spirituality, transcendence, and mystical experience. Covers development in neuroscience about how the brain works in a variety of religious and spiritual contexts, including prayer, meditation, and altered states of consciousness. Prerequisite: graduate standing.

**REL\_ST 7280. Archaeology of Religion. 3 Credits.**

(Same as Anthropology [ANTHRO] 7280) This course examines how anthropologists conceptualize religious behavior, and how archaeologists use material remains to examine past religious behavior, rituals, religious practitioners, cosmological constructs, worldview and ideology in the Americas. Prerequisites: Anthropology [ANTHRO] 2020 and/or Religious Studies [REL\_ST] 2100. Graduate standing required.

**REL\_ST 7380. Anthropological Theory of Religions. 3 Credits.**

(same as Anthropology [ANTHRO] 7380). Course provides a critical evaluation of anthropological explanations of various forms of traditional religious behavior such as magic, shamanism, divination, ritual, mythology and witchcraft. The anthropological explanations examined range from nineteenth century classics to the current approaches of today.

**REL\_ST 7418. Religion Reporting and Writing. 3 Credits.**

(same as Journalism [JOURN] 7426). Advanced seminar in religion reporting and writing. Examines the role of religion journalism in faith, public life, and culture. Prerequisite: graduate standing and Journalism [JOURN] 4450 professional writing experience and instructor's consent.

**REL\_ST 7500. Greek and Roman Religion. 3 Credits.**

(same as Classic Civilization 3550H). Survey of religious development among the Greeks and Romans. Prerequisite: sophomore standing and Classical Humanities [CL\_HUM] 1060, Art History and Archaeology [AR\_H\_A] 1110 or History [HIST] 1520. Honors eligibility required.

**REL\_ST 7510. The Catholic Intellectual Tradition. 3 Credits.**

Students will read the great thinkers of the Catholic church such as Augustine, Abelard, Bernard of Clairvaux, Aquinas, Bonaventure,

Nicholas of Cusa, Pascal, Newman, Maritain, Rahner, Johnson, Tracy. The theme examined may vary from year to year. Prerequisite: graduate standing.

**REL\_ST 7520. Major Religious Thinkers. 3 Credits.**

Concentrated study of one or more selected theologians, such as Augustine, Aquinas, Luther, Calvin, Buber, Tillich, and Rahner. Prerequisites: graduate standing.

**REL\_ST 7630. Sanskrit I. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 7630). This intensive course will cover the essentials of Sanskrit grammar in one semester and prepare students for further readings in Hindu and Buddhist literature. Prerequisite: graduate standing.

**REL\_ST 7640. Sanskrit II. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 7640). This course is intended as a "sampler" of Sanskrit literature. We will read Sanskrit texts in the original. The objectives of the course are 1) Expanding the students' knowledge of the Sanskrit language, 2) To acquaint the students with a broad range of textual genres in Sanskrit literature, and 3) To acquaint the students with some central ideas of Hindu and Buddhist philosophy.

**REL\_ST 7700. Religious Narratives of South Asia. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 4300). Study of major narratives of India and their interpretation in literature and art. Topics include: Vedic and Epic mythology, stories of Krishna, myths and images of Shiva, and forms of the Goddess. Prerequisite: graduate standing and Religious Studies [REL\_ST] 2110, 3200, or 3240, or instructor's consent.

**REL\_ST 7710. The Confucian Tradition: Past and Present. 3 Credits.**

Investigates Confucianism as the dominant religio-philosophical tradition of China and its impact on Korea and Japan. We will study basic Confucian canonical texts, follow its historical development, look at its interactions with other religions, and discuss the continuing relevance of the Confucian tradition in modern East Asia. Prerequisite: graduate standing.

**REL\_ST 7720. Introduction to Daoism. 3 Credits.**

An introduction to the Daoist religious tradition, beginning with its background in earlier forms of philosophy, ritual, and belief. We will follow the development of the various Daoist schools and movements over the centuries and examine key aspects of their belief and practice, both historical and contemporary. Prerequisite: graduate standing.

**REL\_ST 7750. Women, Religion and Culture. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7750). An advanced study of the role of women in religion, focusing on the methods of determining the significance of gender in religious life, sacred texts, symbols, rituals and/or beliefs. Traditions studied include Christianity, Islam, contemporary pagan communities, and Native American traditions. Prerequisite: graduate standing.

**REL\_ST 7800. West African and African Diasporic Religions. 3 Credits.**

Explores traditional African religions and African Islam prior to the slave trade. Also, will examine the Christianity of African American slaves. Prerequisite: graduate standing.

**REL\_ST 7810. African-American Religion. 3 Credits.**

(same as Black Studies [BL\_STU] 7810). Examines the organization of major African American Christian denominations, Islam and religious movements. Twentieth century issues will be discussed, including sexism, classism and homophobia in church communities. Prerequisite: graduate standing.

**REL\_ST 7990. Independent Readings in Religious Studies. 3 Credits.**

Independent readings and research selected in consultation with supervisory faculty.

**REL\_ST 8001. Topics in Religious Studies-General. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 8005. Topics in Religious Studies-Humanities. 3 Credits.**

Organized study of selected topics which vary by semester and are announced at time of registration.

**REL\_ST 8090. Research and Thesis in Religious Studies. 1-6 Credit.**

Research and writing for master's thesis. Graded on S/U basis only.

**REL\_ST 8200. Religious Texts and Interpretation: The Veda. 3 Credits.**

(same as South Asian Studies [S\_A\_ST] 7200). This course examines the Veda, the foundational scripture of Hinduism. It includes close study of Vedic texts and rituals and the influence, interpretation, and application of the Veda in the later Hinduism.

**REL\_ST 8210. Indian Buddhism. 3 Credits.**

This course examines the role of sacred texts in the Theravada and Mayayana Buddhist traditions. The course will emphasize canon formation and ideas about sacred texts in Buddhist traditions.

**REL\_ST 8250. Religious Texts and Interpretation: Gospel Literature. 3 Credits.**

The seminar includes comparative study of ancient gospels, and an examination of modern theories about the development of Jesus traditions.

**REL\_ST 8400. Religious History: Christian Interpretative Communities. 3 Credits.**

This course compares notions of religious authority in the sixteenth century: the Roman Catholic Church's Scripture and tradition and the Protestant principle of sola scriptura. The focus is the doctrine of the Eucharistic disputes carried on throughout the sixteenth century.

**REL\_ST 8430. Religious History: West African Interpretative Communities. 3 Credits.**

In this study of West African religious history, we will examine indigenous African religions, Islam, and Christianity. We will consider the impact of the slave trade, environmental changes, prophetic movements, and changes in the status of women. We will also evaluate theoretical perspectives on the study of Africa, of "traditional religions" and oral traditions. Graduate Standing Required.

**REL\_ST 8440. Religion, Globalization and Local Cultures. 3 Credits.**

Interdisciplinary, comparative approach to globalization's religious dimensions and productions in a variety of specific sites around the world. Graduate Standing Required.

**REL\_ST 8500. History of Religion and Everyday Life in America. 3 Credits.**

This graduate seminar will familiarize you with several theoretical and methodological issues involved in the study of religion in everyday life, its historical recovery and interpretation, and its presentation. We will focus on examples of scholarship on U. S. history. Graduate Standing Required.

**REL\_ST 8600. Comparative Studies in Spirit Possession. 3 Credits.**

This course will investigate four distinct Afro-Latin religious traditions of the Americas, including traditions from Haiti, Cuba, Brazil and Honduras, as well as comparative examples from South Asia, Europe and North

Africa. We will read and discuss such issues as 1) spirit possession and narratively; 2) spirit possession as "history"; 3) possession as dramatic performance; 4) the relationship between sacrifice and possession trance. Through careful exploration of their histories and contemporary practice, the class will attempt general comparisons between the religion as well as the critical review of comparative methods employed.

**REL\_ST 8700. Seminar in Folklore. 3 Credits.**

(same as Anthropology [ANTHRO] 8157 and English [ENGLISH] 8700). Focus on the roots of folklore scholarship and methodology and their evolution in modern approaches to the study of oral, traditional verbal genres and their performance in natural folk groups.

**REL\_ST 8710. Comparative Religion: Popular Religion. 3 Credits.**

Popular religion is the lived religion of the common people which takes shape in contact with and distinction from the religion(s) of the elite(s) of a society. This course introduces concepts and theories of popular religion, and investigates its role in various traditions, including Hinduism, Buddhism, Christianity, and Chinese religions.

## Respiratory Therapy (RS\_THR)

**RS\_THR 1000. Introduction to Respiratory Therapy. 1 Credit.**

Introductory course to assist students acquiring information about the respiratory therapy profession. Students observe therapists in hospitals and participate in lectures on credentialing, program requirements, placement and future trends in the profession. Graded on S/U basis only.

**RS\_THR 3000. Fundamentals of Respiratory Care. 1 Credit.**

Orientation to the profession. Focus on professional attributes of communication, teamwork, licensure and safety. Prerequisite: acceptance into respiratory therapy major.

**RS\_THR 3220. Equipment and Techniques. 5 Credits.**

History, organization of respiratory therapy. Theory, application of gas laws. Equipment for invasive and non-invasive pulmonary assessment, therapeutic aerosol and humidity, gas delivery, airway management. Techniques for infection control, lung expansion, bronchial hygiene. Graded on A/F basis only.

**RS\_THR 3290. Cardiopulmonary Pharmacology. 2 Credits.**

To provide the student with specific knowledge of the pharmacologic strategies in treating cardiopulmonary disorders. Prerequisites: restricted to students in the respiratory therapy program. Graded on A/F basis only.

**RS\_THR 3420. Principles of Mechanical Ventilation. 3 Credits.**

Continuation of Respiratory Therapy 3220. Emphasis on the principles of mechanical ventilation, including physiologic and clinical application. Prerequisite: Respiratory Therapy [RS\_THR] 3220, 3941 and 4040.

**RS\_THR 3440. Mechanical Ventilation Lab. 3 Credits.**

Application of mechanical ventilation emphasizing acute care: pressure, volume, and oscillatory ventilation of adults, Pediatrics, and infants. Related graphical, laboratory, and hemodynamic analysis; therapeutic intervention. Prerequisites: Respiratory Therapy [RS\_THR] 3220, 3941, 4040. Graded on A/F basis only.

**RS\_THR 3941. Clinical Practice I. 2 Credits.**

To be taken concurrently with Respiratory Therapy [RS\_THR] 3220 for which it serves as an extension of the laboratory time and an opportunity for structured clinical experience exposures.

**RS\_THR 3942. Clinical Practice II. 4 Credits.**

To be taken concurrently with Respiratory Therapy [RS\_THR] 3420, for which it serves as an extension of the laboratory time, and an opportunity for structured clinical experience exposures.

**RS\_THR 3943. Clinical Practice III. 2 Credits.**

Continuation of supervised clinical experience from Respiratory Therapy [RS\_THR] 3942. Graded on A/F basis only.

**RS\_THR 4020. Perinatal/Neonatal Respiratory Care. 3 Credits.**

Evaluation and management of perinatal/neonatal pulmonary, medical and surgical conditions which require respiratory care. Emphasis on resuscitation, pathophysiology, evaluation, blood gas and x-ray interpretation, treatment and mechanical ventilation. Prerequisites: Respiratory Therapy [RS\_THR] 4040. Respiratory Therapy students only.

**RS\_THR 4040. Respiratory Pathophysiology. 5 Credits.**

Clinical pulmonary disease, organized around the gross structural components of the lung, airways, alveoli and pulmonary vasculature. Impact of disease on normal structure function; clinical, roentgenographic, and physiologic manifestations are described.

**RS\_THR 4085. Problems in Respiratory Therapy. 1-99 Credit.**

Independent work on special problems related to cardiopulmonary health. Course not offered for graduate credit. Some sections of the course may be graded on either A/F or S/U basis only. Prerequisite: instructor's consent.

**RS\_THR 4220. Community and Patient Education I. 1 Credit.**

Design and implement materials for educational presentations for a given patient population. Prerequisites: Respiratory Therapy [RS\_THR] 3943 or instructor's consent. Graded on A/F basis only.

**RS\_THR 4240. Pulmonary Rehabilitation. 3 Credits.**

Focus is on an interdisciplinary approach to pulmonary rehabilitation and home care of the adult cardiopulmonary patient. Prerequisite: senior Respiratory Therapy standing or instructor's consent. Graded on A/F basis only.

**RS\_THR 4420. Pediatric Respiratory Care. 3 Credits.**

Evaluation and management of pulmonary, medical and surgical pediatric conditions requiring respiratory care. Emphasis on pediatric resuscitation, pathophysiology, treatment and prevention of respiratory conditions, mechanical ventilation, lab interpretation. Prerequisite: Respiratory Therapy [RS\_THR] 3420, 4020, 4040 or instructor's permission.

**RS\_THR 4440. Organization and Administration. 3 Credits.**

(same as Radiologic Science [RA\_SCI] 4440 and Cardiopulmonary and Diagnostic Science [CPD] 4440). Examines design and operation of allied health service departments and educational programs, including facilities, personnel procedures, record systems, ethics, medical-legal aspects, interdepartmental relations and curriculum development.

**RS\_THR 4460. Evidence-Based Medicine in Respiratory Care. 3 Credits.**

This course is intended to facilitate the development of the student's ability to obtain and integrate patient assessment information and key findings and to formulate clinical decisions in respiratory therapy practice as well as use an evidence-based medicine approach to define respiratory clinical practice.

**RS\_THR 4620. Pulmonary Function Technologies. 1 Credit.**

This course will provide the student with a specific knowledge of the testing procedures and equipment for pulmonary function technology. The student will learn to interpret pulmonary function tests and perform

quality assurance within the pulmonary function laboratory. Prerequisite: restricted to Respiratory Therapy students only.

**RS\_THR 4640. Teaching Practicum. 3 Credits.**

Structured and supervised experience identifying student characteristics, methods for teaching, improving assessment, current development and instructional design.

**RS\_THR 4660. Advanced Mechanical Ventilation Theory. 3 Credits.**

Exploration of advanced disease management via specific disease processes as well as concepts and modes of mechanical ventilation. Emphasis will be placed on mode selection for various disease and how new modes of mechanical ventilation impact disease management.

**RS\_THR 4720. Advanced Pulmonary Function Technology. 2 Credits.**

This course will focus on the respiratory therapist's role in diagnostic testing. Topics include pulmonary function tests, exercise tests, and metabolic studies. In addition the course briefly addresses polysomnography, pulmonary rehabilitation, and home care. Restricted to Respiratory Therapy students only. Graded on A/F basis only.

**RS\_THR 4820. Adult Critical Care. 3 Credits.**

This course will focus on the respiratory therapist's role in the adult critical care environment. Topics include airway management, mechanical ventilation, general adult critical care and functioning as a vital member of the critical care team. Prerequisite: restricted to Respiratory Therapy students only.

**RS\_THR 4920. Community and Patient Education II. 1-3 Credit.**

Presentations to a variety of community groups. Emphasis on wellness and disease prevention. Prerequisites: Respiratory Therapy [RS\_THR] 4220 or instructor's consent. Graded on A/F basis only.

**RS\_THR 4940. Clinical Practice IV. 5 Credits.**

Structured and supervised clinical experience and case conferences regarding bioterrorism response and emergency/disaster planning. Prerequisites: Respiratory Therapy [RS\_THR] 3420, 3942, 3440, 3943, 4020.

**RS\_THR 4956. Research in Respiratory Therapy. 2-6 Credit.**

Selected research projects guided by a senior staff member. Prerequisite: Cardiopulmonary and Diagnostic Science [CPD] 4955.

**RS\_THR 4973. Clinical Practice V. 4 Credits.**

An extension of the supervised practicum begun in Respiratory Therapy [RS\_THR] 4940. Emphasis in adult critical care and special procedures including bronchoscopies, cardiac catheterization and chest tube placement.

**RS\_THR 4983. Clinical Practice VI. 5 Credits.**

An extension of the supervised practicum begun in Respiratory Therapy [RS\_THR] 4940. Emphasis in perinatal and pediatric critical care including pediatric pulmonary function testing and airway management.

**RS\_THR 4990. Respiratory Therapy Capstone. 2 Credits.**

Integration of literature, knowledge of previous coursework and clinical experience. Prerequisites: Senior standing and Respiratory Therapy Major.

**RS\_THR 4993. Clinical Practice VII. 5 Credits.**

An extension of the supervised practicum begun in Respiratory Therapy [RS\_THR] 4940. Emphasis in rehabilitation and home care, inservice education, and management. Students will participate in on-going research projects and community service activities.

**RS\_THR 7040. Respiratory Pathophysiology. 5 Credits.**

Clinical pulmonary disease, organized around the gross structural components of the lung, airways, alveoli and pulmonary vasculature. Impact of disease on normal structure/function; clinical, roentgenographic, and physiologic manifestations are described. Prerequisite: graduate standing.

## **Romance Languages (RM\_LAN)**

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**RM\_LAN 2001. Undergraduate Topics in Romance Languages-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. Prerequisite: departmental consent for repetition.

**RM\_LAN 2200. Introduction to Catalan Language and Culture. 3 Credits.**

This is an introductory course to Catalan language and culture. Previous knowledge of another Romance language might be beneficial. Students will learn basic Catalan expressions, vocabulary and grammatical structures. Furthermore, students will begin to familiarize themselves with elements of Catalan culture. Prerequisite: Some knowledge of a Romance language desirable.

**RM\_LAN 2310. Literature of the African Diaspora. 3 Credits.**

(same as Black Studies [BL\_STU] 2310) A postcolonial analysis of selected literary texts interpreting the African diaspora in the Americas. Exemplary texts from the Caribbean (English, French, Spanish), South America and the United States are discussed in comparative perspective. No knowledge of Spanish required. Prerequisite: English [ENGLSH] 1000.

**RM\_LAN 2820. Trends in World Cinema. 3 Credits.**

(same as Film Studies [FILM\_S] 2820 and German [GERMAN] 2820). This course is a historical overview of the major trends in international cinema. It focuses on the intersection of aesthetics, industry, and ideological and social concerns in cinematic production. Prerequisite: sophomore standing, English [ENGLSH] / Film Studies [FILM\_S] 1800 or instructor's consent.

**RM\_LAN 3200. Catalan Culture and Identity. 3 Credits.**

Students in this course are not expected to have previous exposure to Catalan instruction. If they do, it will enhance their learning experience. Knowledge of another Romance language might be beneficial as well. This is a course focused on Catalan culture and identity. Students will learn about the history of the language, the language policies in Spain and Europe, Catalan literature, cinema, music, and food. Students will read different materials in English for the most part. Course is taught in English. Sophomore standing required.

**RM\_LAN 3820. Major Directors. 3 Credits.**

(Same as English [ENGLSH] 3820 and Film Studies [FILM\_S] 3820). Topics (e.g. Hitchcock, Kubrick, Fellini, Allen, Kurosawa, Wilder) announced at time of registration. Only 6 hours may be taken for credit toward major. Prerequisite: English [ENGLSH] 1000 and English [ENGLSH] / Film Studies [FILM\_S] 1800. Graded A-F only.

**RM\_LAN 4310. Literature of the African Diaspora. 3 Credits.**

A study, in English translation, of writings by authors of African descent in the Americas. Prerequisite: junior standing or instructor's consent.

**RM\_LAN 4730. Linguistic Theory and Language Acquisition. 3 Credits.**

(same as Linguistics [LINGST] 4730). The goal of this class is to study the implications of current linguistic theory for contemporary research on second language acquisition. In particular, the hypothesis that second language acquisition follows some of the same principles as first language acquisition is explored. Course is taught in English. Prerequisites: Spanish [SPAN] 4721/7721, French [FRENCH] 4720/7720, English [ENGLSH] 4600/7600 or LINGST 4860/7860.

**RM\_LAN 4940. Service Learning in Romance Languages. 1 Credit.**

(same as Spanish [SPAN] 4940 and French [FRENCH] 4940). Course offers our majors and advanced minors the opportunity to use their language skills in real-life community settings. Graded on S/U basis only. Does not meet A&S general education requirements. May be repeated once for credit. Prerequisites: junior or senior standings and departmental consent.

**RM\_LAN 7310. Literature of the African Diaspora. 3 Credits.**

A study, in English translation, of writings by authors of African descent in the Americas. Prerequisite: graduate standing or instructor's consent.

**RM\_LAN 7730. Linguistic Theory and Language Acquisition. 3 Credits.**

(same as Linguistics [LINGST] 7730). The goal of this class is to study the implications of current linguistic theory for contemporary research on second language acquisition. In particular, the hypothesis that second language acquisition follows some of the same principles as first language acquisition is explored. Course is taught in English. Prerequisites: graduate standing and Spanish [SPAN] 4721/7721, French [FRENCH] 4720/7720, English [ENGLSH] 4600/7600 or Linguistics [LINGST] 4860/7860.

**RM\_LAN 8085. Problems in Romance Languages. 1-99 Credit.**

Prerequisites: instructor's consent.

**RM\_LAN 8087. Seminar in Literature and Languages of the African Diaspora. 3 Credits.**

One of two courses devoted to the theory and practice of African diaspora literary criticism. Beginning with the United States, we address the issues of developing appropriate theoretical models for black literatures in the Americas. Prerequisite: graduate standing.

## Rural Sociology (RU\_SOC)

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**RU\_SOC 1000. Rural Sociology. 3 Credits.**

Introduction to basic concepts and principles of sociology with a focus on rural populations and places. The course explores interconnections between rural/urban and local global economies and cultures. Students are exposed to the rich diversity of rural society, social changes underway, and to current social issues. (Students may not earn credit for both RU\_SOC 1000 and SOCIOL 1000).

**RU\_SOC 1103. Topics in Rural Sociology - Behavioral Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. May be repeated. Prerequisites: RU\_SOC 1000 or SOCIOL 1000.

**RU\_SOC 1104. Topics in Rural Sociology - Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. May be repeated. Prerequisites: RU\_SOC 1000 or SOCIOL 1000.

**RU\_SOC 1120. Population and the Environment. 3 Credits.**

(same as SOCIOL 1120 and PEA\_ST 1120). Changes in the structure and characteristics of population groups and their relationship to both human and non-human aspects of the biophysical environment.

**RU\_SOC 1150. The Amish Community. 3 Credits.**

(same as PEA\_ST 1150). Examines historical antecedents and contemporary culture and social structure of the Amish. Topics include cultural symbols, life ceremonies, the family, counter-cultural pressures, stresses, social change. Prerequisites: RU\_SOC 1000 SOCIOL 1000 or ANTHRO 1000.

**RU\_SOC 1175. The Health of People in Local Communities. 3 Credits.**

Health is a universal concern of all people. However, the place of residence has a major impact on many things closely related to health including the local cultural such as diets, exercise, occupations, local health services, etc. This is an introduction to these topics. Prerequisite: introduction to Sociology or Rural Sociology.

**RU\_SOC 2010. Leadership in Today's World. 3 Credits.**

Examination of dynamics of group leadership, especially in local voluntary organizations; study of how leader's behavior is related to success or failure of organization's program. Prerequisites: RU\_SOC 1000 or SOCIOL 1000.

**RU\_SOC 2203. Topics in Rural Sociology - Behavioral Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. May be repeated. Prerequisites: RU\_SOC 1000 SOCIOL 1000 or Anthropology [ANTHRO] 1000.

**RU\_SOC 2204. Topics in Rural Sociology - Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. May be repeated. Prerequisites: RU\_SOC 1000 SOCIOL 1000 or ANTHRO 1000.

**RU\_SOC 2225. Science, Technology and Society. 3 Credits.**

Overview of the social influences that shape science including how scientific knowledge is contested and legitimated; how social forces (among them mass communication) influence the choice of innovations; and the role social systems and sectors play in the use and benefit of science. Communication intensive-discussion, presentation and essay based. Prerequisites: RU\_SOC 1000 or SOCIOL 1000.

**RU\_SOC 2950. Social Research I. 3 Credits.**

(same as SOCIOL 2950). Introduction to principles of methodology; theory and research; survey of basic research designs and perspectives; preparation for understanding and conducting social research. Required for Sociology majors.

**RU\_SOC 3085. Problems in Rural Sociology. 1-99 Credit.**

Prerequisite: instructor's consent.

**RU\_SOC 3100. Recent Theories in Sociology. 3 Credits.**

(same as SOCIOL 3100). Introduction to major theoretical positions and issues in contemporary American sociology. Logical and intellectual structure of major theoretical schools: functionalism, conflict, exchange,

symbolic interaction, phenomenological-ethnomethodological theories.  
Prerequisite: SOCIOL 2200.

**RU\_SOC 3235. Global Perspectives and Realities. 3 Credits.**

Designed for students who have or wish to study, live or work outside of their home country. Presents sociological perspectives on globalization and intercultural communication as well as the steps needed to prepare for a valuable and safe experience abroad.

**RU\_SOC 3303. Topics in Rural Sociology - Behavioral Science. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. May be repeated. Prerequisites: 6 hours Rural Sociology or Sociology, or junior standing.

**RU\_SOC 3304. Topics in Rural Sociology - Social Science. 2-3 Credit.**

Organized study of selected topics. Subjects and earnable credit vary from semester to semester. May be repeated. Prerequisites: 6 hours Rural Sociology or Sociology, or junior standing.

**RU\_SOC 3325. Sociology of Food and Nutrition. 3 Credits.**

This class explores individual food choices and larger social forces. Topics include: world hunger, food and the environment; food choices and culture, class and personal identity; the effects of social stigmas, advertising trends, and government regulations on body image; new social movements for sustainable food systems. Prerequisite: ENGLSH 1000 and junior or senior standing or instructor's permission.

**RU\_SOC 3940. Practicum in Rural Sociology. 3 Credits.**

Independent research or professional experience under faculty supervision. Projects must be arranged by student and faculty member prior to registration. Prerequisites: junior standing, departmental consent.

**RU\_SOC 4120. Social Statistics. 3 Credits.**

(same as SOCIOL 4120). Descriptive statistics and bivariate quantitative analysis techniques commonly used by social scientists. Includes coverage of parametric and non-parametric methods. Introduction to computer analysis. Prerequisite: SOCIOL 2950.

**RU\_SOC 4301. Topics in Rural Sociology. 3 Credits.**

Current and new topics not currently offered in applied and/or theoretical areas in Rural Sociology. Prerequisites: RU\_SOC 1000 or SOCIOL 1000 or equivalent. Graded on A/F basis only.

**RU\_SOC 4310. Sociology of Agriculture and Natural Resources. 3 Credits.**

Human dimensions of agriculture and natural resource management by giving an overview of sociological approaches related to these fields. Special emphasis is given to social organization, globalization and social constructions related to food and natural resources. Prerequisite: junior standing.

**RU\_SOC 4325. American Community Studies. 3 Credits.**

An introduction to the study of American communities. The course starts with community theories and then focuses on a wide variety of historic and contemporary community studies such as Plainville, Middletown, Sidewalk and others. Seminar format.

**RU\_SOC 4335. Social Change and Development. 3 Credits.**

(same as SOCIOL 4335). Nature of social change and development. Emphasizes sociological theories of social change and development contrasting them with approaches from the disciplines. Prerequisites: RU\_SOC 1000 or SOCIOL 1000 and junior standing.

**RU\_SOC 4341. Building Communities from the Grassroots. 3 Credits.**

(Same as PEA\_ST 4341). Introduction and application of basic community development concepts, methods and practical skills for involving and empowering local citizens and leaders effectively in community-based efforts regardless of the issue. Prerequisite: instructor's consent.

**RU\_SOC 4342. Empowering Communities for the Future. 3 Credits.**

Focuses on the professional practice and applications of community-based development including participatory action research, community economic development, organizational development, use of technology, citizen education and integration of practice. Graded on A/F basis only. Prerequisite: instructor's consent.

**RU\_SOC 4343. Creating Capacity for Dynamic Communities. 3 Credits.**

Addresses community and citizen power; large group intervention processes for change; facilitating small group process; community organizing; community sustainability, dealing with poverty and disenfranchisement; community conflict resolution; ethics; and integration into practice. Graded on A/F basis only. Prerequisite: instructor's consent.

**RU\_SOC 4370. Environmental Sociology. 3 Credits.**

(same as SOCIOL 4370). An interdisciplinary examination of domestic and international environmental issues focusing on social, cultural, and policy dimensions. Perspectives of the social sciences and humanities are included. Prerequisites: junior standing.

**RU\_SOC 7120. Social Statistics. 3 Credits.**

(same as SOCIOL 7120). Descriptive statistics and bivariate quantitative analysis techniques commonly used by social scientists. Includes coverage of parametric and non-parametric methods. Introduction to computer analysis. Prerequisite: graduate standing and SOCIOL 2950.

**RU\_SOC 7301. Topics in Rural Sociology. 3 Credits.**

Current and new topics not currently offered in applied and/or theoretical areas in Rural Sociology. Prerequisite: RU\_SOC/SOCIOL 1000 or equivalent, RU\_SOC 4301; graduate standing. Graded on A/F basis only.

**RU\_SOC 7310. Sociology of Agriculture and Natural Resources. 3 Credits.**

Human dimensions of agriculture and natural resource management by giving an overview of sociological approaches related to these fields. Special emphasis is given to social organization, globalization and social constructions related to food and natural resources.

**RU\_SOC 7325. American Community Studies. 3 Credits.**

An introduction to the study of American communities. The course starts with community theories and then focuses on a wide variety of historic and contemporary community studies such as Plainville, Middletown, Sidewalk and others. Seminar format. Prerequisite: graduate standing.

**RU\_SOC 7335. Social Change and Development. 3 Credits.**

(same as SOCIOL 7335). Nature of social change and development. Emphasizes sociological theories of social change and development contrasting them with approaches from other disciplines. Prerequisites: RU\_SOC 1000 or SOCIOL 1000 and graduate standing.

**RU\_SOC 7341. Building Communities from the Grassroots. 3 Credits.**

Introduction and application of basic community development concepts, methods and practical skills for involving and empowering local citizens and leaders effectively in community-based efforts regardless of the issue. Prerequisite: graduate standing or instructor's consent.

**RU\_SOC 7342. Empowering Communities for the Future. 3 Credits.**

Focuses on the professional practice and applications of community-based development including participatory action research, community economic development, organizational development, use of technology, citizen education and integration of practice. Graded on A/F basis only. Prerequisite: graduate standing and instructor's consent.

**RU\_SOC 7343. Creating Capacity for Dynamic Communities. 3 Credits.**

Addresses community and citizen power; large group intervention processes for change; facilitating small group process; community organizing; community sustainability, dealing with poverty and disenfranchisement; community conflict resolution; ethics; and integration into practice. Graded on A/F basis only. Prerequisite: graduate standing and instructor's consent.

**RU\_SOC 7370. Environmental Sociology. 3 Credits.**

(same as SOCIOL 7370). An interdisciplinary examination of domestic and international environmental issues focusing on social, cultural, and policy dimensions. Perspectives of the social sciences and humanities are included. Prerequisites: graduate standing.

**RU\_SOC 7445. Seminar on Issues in the Sociology of Agriculture and Natural Resources. 3 Credits.**

Issues in current research in the sociology of agriculture of developing and industrial nations. Links sociological theory with research in agriculture, examining contributions of applied research to sociological knowledge.

**RU\_SOC 7446. Community Social Structure. 3 Credits.**

(same as SOCIOL 7446). A comparative study of communities in different nations and in urban and rural areas. A primary focus of the course will be on social change in communities in response to changing economic, political, social, cultural, and ecological factors.

**RU\_SOC 8085. Problems in Rural Sociology. 1-99 Credit.**

Research for student capable of semi-independent work. Prerequisite: instructor's consent.

**RU\_SOC 8090. Research in Rural Sociology. 1-99 Credit.**

Research leading to thesis or dissertation. Graded on a S/U basis only.

**RU\_SOC 8130. Advanced Social Statistics. 3 Credits.**

(same as SOCIOL 8130). Introduction to multivariate analysis for social scientists. Emphasis on non-experimental applications of analysis of variance and correlation-regression. Computer applications emphasized. Prerequisite: graduate standing and RU\_SOC 4120 or equivalent.

**RU\_SOC 8287. Seminar on Sustainable Development. 3 Credits.**

(same as SOCIOL 8287). An interdisciplinary examination of sustainable development focusing on social, economic, cultural and environmental dimensions of development. International and domestic issues and approaches to sustainable development are included.

**RU\_SOC 8430. Program Development and Evaluation. 3 Credits.**

(same as AG\_ED 8430). Program development principles, teaching plans and evaluation principles applied to extension program development. Prerequisite: instructor's consent.

**RU\_SOC 8435. Political Ecology. 3 Credits.**

Political ecology is an analytical approach to environment and natural resource issues at local, regional and global scales, emphasizing political, economic, cultural, social and historical factors and their relationship to ecological trends and processes. Seminar format. Graded on A/F basis only. Graduate Standing Required.

**RU\_SOC 8444. Agriculture, Food and Community. 3 Credits.**

Introduces key debates in the sociology of food and agriculture. Includes research on the structure and history of the agriculture system and its impacts on farmers, communities and the natural environment.

**RU\_SOC 8447. Seminar on Contemporary Issues in Rural Sociology. 1-99 Credit.**

Seminar on Contemporary Issues in Rural Sociology.

**RU\_SOC 8448. Society and Ecosystems Research Seminar. 3 Credits.**

(same as AG\_EC 8448 and NAT\_R 8448). This seminar, capstone for the Graduate Certificate Program in Society and Ecosystems, exposes students to interdisciplinary research on interactions between social, economic and ecological systems.

**RU\_SOC 8450. Research in Rural Sociology. 1-99 Credit.**

Research not expected to terminate in thesis or dissertation. Prerequisite: instructor's consent.

**RU\_SOC 8510. Research Methods and Design. 3 Credits.**

(same as AG\_ED 8510). A foundations course on quantitative research methodology and design principles for investigating problems in social and behavioral sciences. A focus is on the language of research, purposes, validity threats, and data collection methods. Graded on A/F basis only.

**RU\_SOC 8540. Methods of Qualitative Research. 3 Credits.**

(same as AG\_ED 8540). Overview of philosophies, approaches toward, design, data collection, analysis and reporting of qualitative research.

**RU\_SOC 8610. Economic and Sociological Approaches to Collective Action. 3 Credits.**

(same as AG\_EC 8610). This course identifies analytical and methodological tools, including rational choice and social capital, to deal with practical problems of collective action in: agricultural cooperatives, rural community development, political interest groups and other mutuals. Prerequisite: AG\_EC 8610.

**RU\_SOC 9090. Research in Rural Sociology. 1-99 Credit.**

Research leading to thesis or dissertation. Graded on a S/U basis only.

**RU\_SOC 9287. Seminar in Qualitative Methods in Sociology. 3 Credits.**

(same as SOCIOL 9287). Examination of various qualitative methods of research, including problem-formulation, access and interpretation of data, theory-generation, and preparation of research reports. Prerequisites: RU\_SOC 8510 or instructor's consent.

**RU\_SOC 9437. Synthesis of Theory and Method in Sociology. 3 Credits.**

The purpose of the course is to provide the student with a critical understanding of the basic theoretical paradigms employed in the development of research projects in sociology. The course is designed for graduate students. Prerequisites: RU\_SOC 4130 and RU\_SOC 8510, or instructor's consent.

**RU\_SOC 9480. Community Survey Research. 3 Credits.**

(same as SOCIOL 9987). This course applies social science survey research methods to the unique kinds of problems that arise in the study of whole communities. Prerequisite: RU\_SOC 8510 or equivalent.

**RU\_SOC 9510. Data Collection, Analysis and Interpretation. 3 Credits.**

(same as AG\_ED 9510). A quantitative methods course in measurement, data collection and analysis related to social and behavioral science

research. An applied approach is taken on instrumentation and analyzing data using descriptive and inferential statistics. Practical skills in data manipulation using SPSS are developed. Prerequisite: AG\_ED 8510/ RU\_SOC 8510 or instructor's consent. Graded on A/F basis only.

**RU\_SOC 9837. Seminar in Multivariate Analysis Techniques. 3 Credits.**

(same as SOCIOL 9837). Examination of various qualitative techniques of data analysis. Prerequisites: RU\_SOC 8510 or instructor's consent.

## Russian (RUSS)

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**RUSS 1100. Elementary Russian I. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly.

**RUSS 1200. Elementary Russian II. 6 Credits.**

Five hours of classroom instruction, with one hour lab work weekly. Prerequisite: C- or better in Russian [RUSS] 1100 or equivalent.

**RUSS 2001. Undergraduate Topics in Russian-General. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. May be repeated with consent of department.

**RUSS 2005. Undergraduate Topics in Russian-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and credits may vary from semester to semester. May be repeated with consent of department. No language credit.

**RUSS 2100. Classics and Iconoclasts: An Introduction to Russian Literature. 3 Credits.**

Designed to introduce students to some of the major genres, issues, and approaches in the study of Russian literature. Begins with the most classic of Russian authors, the so-called "father of Russian literature" Aleksandr Pushkin, then moves on to two "classics" from the 19th century (Gogol, Chekhov) and two "iconoclasts" from the first part of the 20th (Mayakovsky, Kharms). Covers a range of genres, including poetry, short story, and drama, as well as letters, essays and manifestoes. Course reading list includes secondary essays that both shed light on specific texts/authors as well as provide models for critical and theoretical approaches to literature, with an emphasis on Russian Formalism. Readings and discussions in English; no knowledge of Russian language or literature required. Prerequisite: sophomore standing or instructor's consent.

**RUSS 2120. Russia: Enigma Wrapped in Mystery. 3 Credits.**

Broad introduction to the study of Russia as a discipline; designed to acquaint the student with a wide range of topics connected to the study of Russia. Prerequisite: sophomore standing or instructor's consent.

**RUSS 2130. Second-Year Russian I. 4 Credits.**

Students will solidify their command of Russian grammar and begin developing their reading skills. Prerequisite: Russian [RUSS] 1200, equivalent, or instructor's consent.

**RUSS 2160. Second-Year Russian II. 4 Credits.**

Continuation of Russian [RUSS] 2130. Prerequisites: RUSS 2130 or equivalent.

**RUSS 2310. Between Heaven and Earth: Russian Civilization. 3 Credits.**

Survey of Russian culture from the Christianization of the Slavic peoples to late imperial period. No foreign language credit.

**RUSS 2320. The Arts of Survival: Civilization in Soviet Times. 3 Credits.**

Historical, social, and artistic topics. No foreign language credit. Humanities credit.

**RUSS 2330. Russia and America as Comparative Civilizations. 3 Credits.**

Analyzes similar developments in the arts, architecture, literature, and film of Russia and America.

**RUSS 2570. The Supreme Measure: Capital Punishment in Russian History and Literature. 3 Credits.**

Highlights historical, ethical, and religious aspects of capital punishment across the span of Russian history. Provides an opportunity to explore a difficult topic using material unknown to most students; a serious course in literary history. Develops critical thinking skills.

**RUSS 2865. The Art of Soviet and Russian Cinema. 3 Credits.**

(Same as Film Studies [FILM\_S] 2865) Topics (e.g. Distorted Picture: Post-War Cinema in the Soviet State, Cinema in the Soviet Times and Beyond, etc.) announced at time of registration. Only 6 hours may be taken towards major.

**RUSS 3001. Topics in Russian-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing, departmental consent for repetition.

**RUSS 3005. Topics in Russian-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing, departmental consent for repetition.

**RUSS 3130. Intermediate Russian. 3 Credits.**

Normally taken as 5th semester of Russian language sequence. Prerequisites: Russian [RUSS] 2160 or equivalent or instructor's consent.

**RUSS 3160. Intermediate Conversation and Composition. 3 Credits.**

Further develops oral command of Russian as well as listening comprehension and some letter writing skills. Prerequisite: Russian [RUSS] 2160 or 3130 or instructor's consent.

**RUSS 3310. Heroes of Their Times: Individualism in Russian Literature. 3 Credits.**

Examines selected works by the major Russian writers of the first half of the nineteenth century. Reading and lectures in English. Prerequisite: sophomore standing or instructor's consent.

**RUSS 3320. Matters of Life and Death: The Fiction of Tolstoy and Dostoevsky. 3 Credits.**

Analyzes the major works of Tolstoy and Dostoevsky. Readings and lectures in English. Prerequisite: sophomore standing or instructor's consent.

**RUSS 3330. Decline, Fall, and Resurrection in Modern Russian Literature. 3 Credits.**

Analysis of the major trends in Russian literature and related cultural developments from 1890 to 1930. Readings and lectures in English. Prerequisite: sophomore standing or instructor's consent.

**RUSS 3350. The Split Tree of Russian Literature: Contemporary Russian Prose. 3 Credits.**

Analyzes the divided tradition of Russian literature since 1930 in the works of such authors as Nabokov, Pasternak, Bulgakov, and Solzhenitsyn. Readings and lectures in English. Prerequisite: sophomore standing or instructor's consent.



**RUSS 3380. Sinners, Saints, and Madmen: 19th Century Russian Literature. 3 Credits.**

Introduction to foundational periods (Sentimentalism, Romanticism, Realism and its decline), narratives, and authors of 19th century Russian literary tradition. Traces development of the "Russian" short story and novel forms, as well as the all-important "Petersburg" theme. Prerequisite: English [ENGLSH] 1000; sophomore standing.

**RUSS 3390. True Fictions: Russian Prose since 1900. 3 Credits.**

Survey of Russian prose fiction of the twentieth and early twenty-first century. During this time Russia experienced a series of drastic changes in society and culture, and as often happens the artists responded more rapidly and insightfully than anyone else. This was a time of radical experimentation with the very nature of literature, and we will read and examine some of the fascinating results. Course gives a short history of Russian prose fiction after 1900, offers a theory of analytical reading of imaginative prose, and hones the skills of intelligent writing about evaluative reading. Readings, lecture and discussion in English; no previous knowledge of Russian literature is assumed. Prerequisites: sophomore standing, or instructor's consent.

**RUSS 3630. Russian Classics I. 3 Credits.**

Reading and discussion of selected works by major Russian writers of the nineteenth century. Course conducted in Russian. May be taken before or after Russian [RUSS] 3640. Prerequisite: RUSS 3130 or instructor's consent.

**RUSS 3640. Russian Classics II. 3 Credits.**

Reading and discussion of selected works by major Russian writers of the twentieth century. Course conducted in Russian. May be taken before or after Russian [RUSS] 3630. Prerequisite: RUSS 3130, or instructor's consent.

**RUSS 3870. Russian Women and Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3870 / Women's and Gender Studies [WGST] 3870). Traces image(s) of the Russian woman in 20th-century Russia as constructed in Russian, Soviet and late-Soviet film. Discusses heroines of pre-revolutionary melodrama and "new Soviet man and woman" of the 20s. Considers war-time re-alignment of gender roles in defense of motherland and their subtle revamping in post-war and post-Stalinist period, and the shifting relations between women and men, women and women, and women and the State. Emphasizes cultural-historical and ideological status of women as reflected in onscreen image(s) in Russian film. Designed to serve as an introduction to film studies and to 20th-century Russian culture more generally. Conducted in English (all films have English subtitles). Prerequisite: sophomore standing or instructor's consent.

**RUSS 3890. Russian and Soviet Cinema. 3 Credits.**

(same as Film Studies [FILM\_S] 3890). Survey and analysis of selected Soviet films. Emphasis on film-making as a form of art. English or subtitled. Second screenings by arr. Some films may run over 2 hrs. No foreign language credit. Prerequisite: junior standing or instructor's consent.

**RUSS 3895. Service Learning in Russian Studies. 2 Credits.**

Service learning offers students a chance to put into practice what they have learned in theory. Students work as teacher-aids or tutors in foreign language/culture classes at area schools. Graded on S/U basis only. Does not meet A&S foundation requirements. Prerequisites: instructor's consent.

**RUSS 3896. Honors in Russian. 1-3 Credit.**

Special problems in Slavic literature or linguistics. Prerequisite: consent of departmental Honors director.

**RUSS 4001. Topics in Russian-General. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition.

**RUSS 4005. Topics in Russian-Humanities. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisites: junior standing and instructor's consent, departmental consent for repetition.

**RUSS 4070. Intensive Beginning Russian. 3 Credits.**

Designed to lead quickly to a reading knowledge of Russian. Cannot be taken to fulfill undergraduate language requirement. Intended for graduate students in other departments who plan to conduct research in Russian. Prerequisite: junior standing or instructor's consent.

**RUSS 4160. Advanced Russian Conversation. 3 Credits.**

Advanced syntax, idiomatic constructions, and vocabulary building. Prerequisite: Russian [RUSS] 3160 or equivalent.

**RUSS 4350. Special Readings in Russian. 1-3 Credit.**

Prerequisites: junior standing and chairman's consent.

**RUSS 4420. Russian Poetry. 3 Credits.**

Survey of readings in Russian poetry from its beginnings to present. Prerequisite: Russian major or instructor's consent.

**RUSS 4430. Russian Drama. 3 Credits.**

Selected readings in and discussions of major Russian plays of the nineteenth and twentieth century. Prerequisite: Russian major or instructor's consent.

**RUSS 4435. Russian Prose. 3 Credits.**

Explores the development of prose writing in modern Russian letters, paying special attention to native generic designations. Considers dual imagery of realist/naturalist and romantic/fantastic approaches. Studies diverse examples: rasskaz (story), the povest' (tale), the novella, novel essay early 19th c. through 20th c. Considers ways in which literature can itself stand as a philosophical form.

**RUSS 4440. The Russian Novel. 3 Credits.**

Selected readings and seminar discussion of major novelists of the 19th and 20th centuries. Prerequisites: Russian major or instructor's consent.

**RUSS 4450. Russian Capstone Seminar. 3 Credits.**

Topics vary from year to year. The capstone course brings together aspects of Russian literature and culture studied during the degree program. Prerequisite: Russian major or instructor's consent.

**RUSS 4510. The Art and Life of Pushkin. 3 Credits.**

Gives a conceptual thematic overview of Alexander Pushkin's lyrical poetry, as well as some dramatic work and prose. Special attention paid to the parallel development of his artistic and religious beliefs. Poetry read in Russian; prose and dramatic poems in Russian and English. Prerequisite: Russian major or instructor's consent.

**RUSS 4520. Nikolai Gogol. 3 Credits.**

Study of the life and art of Nikolai Gogol. Includes biographical overview, Ukrainian stories, dynamics of folklore, local dialect, and the process of literary creation. Considers St. Petersburg stories, novels, and plays. Prerequisite: Russian major or instructor's consent.

**RUSS 4530. Dostoevsky. 3 Credits.**

Introduction to the works of Fyodor Dostoevsky, including selections from both the shorter works and the major novels. Prerequisite: Russian majors or graduate standing or instructor's consent.

**RUSS 4540. Tolstoy's Fiction and Truth. 3 Credits.**

Provides a conceptual overview and analysis of two masterpieces of Tolstoy's art. Acquaints students with the complex and hidden connections between Tolstoy's artistic methods and religious beliefs. Prerequisites: Russian major or instructor's consent.

**RUSS 4550. Nabokov's Russian Fiction. 3 Credits.**

Systematic analysis of Vladimir Nabokov's fiction, both novels and short stories. Emphasis on the artistic properties of prose. Lectures and class discussion in English. Readings in Russian (English translations for undergraduate students). Prerequisite: Russian major or instructor's consent.

**RUSS 4730. Internship in Russian. 3 Credits.**

Supervised introduction to the methodology of the teaching of elementary Russian; conducted in a classroom environment. Prerequisite: Russian major or graduate standing or instructor's consent.

**RUSS 4820. Blogging the World: The Web in Cultural Context. 3 Credits.**

(same as German [GERMAN] and French [FRENCH] 4820). Innovative interdisciplinary course addresses issues of access to international news and specific cultural context working in cross-disciplinary teams. Students in journalism, foreign language, international studies, political science and various other disciplines track cultural developments and information on no-US Web sites, blogs and digital social networks along with exploring various historical forms of communication that preceded the digital era of the Web. Students analyze the potential and limitations/ effects of blogs and the web in specific contemporary cultural contexts and as part of the broader historical evolution of the web. The course is taught in English. The goal of this course is two-fold; students learn the particulars of web blogging, explore various features of the contemporary social network landscape while focusing on the concept of culture, in particular the cultures of Europe and the US. Questions asked are: what is culture? What is common or popular right now in other cultures? And how do new social networks amplify or alter certain features or culture across national and international contexts? Prerequisite: sophomore standing required.

**RUSS 4896. Honors Thesis in Russian. 3 Credits.**

Intended for Russian majors in their final year of study who have completed the majority of course requirements within the major and are prepared to engage in an independent research project that culminates in a 25-40 page thesis paper. To be considered for honors thesis, the student should be in his/her final year of the major; must have completed at least three courses in literature, one of which must be at the 4000 level. Graded on A-F basis only. Prerequisites: Russian major; senior standing and have a minimum cumulative GPA to 3.3, and a GPA of 3.5 or above within the major. It is also highly recommended that the student have completed an independent reading course the previous semester (e.g. RUSS 3896; RUSS 4350).

**RUSS 7085. Problems in Russian and Slavonic Studies. 1-99 Credit.**

Prerequisite: graduate standing and instructor's consent.

**RUSS 7087. Seminar in Russian. 3 Credits.**

Course content varies. Prerequisites: graduate standing and instructor's consent.

**RUSS 7105. Topics in 19th Century Russian Literature-General. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**RUSS 7205. Topics in 20th Century Russian Literature. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**RUSS 7305. Topics in Slavic Linguistics. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**RUSS 7310. Russian Literary History. 3 Credits.**

A study of the major works of Russian literature in relation to their representations in literary history. This is a capstone course that draws on knowledge acquired in previous or concurrent courses. Prerequisite: graduate standing.

**RUSS 7350. Special Readings in Russian. 1-3 Credit.**

Prerequisites: graduate standing and chairman's consent.

**RUSS 7405. Topics in Slavic Literatures. 1-99 Credit.**

Prerequisite: graduate standing and instructor's consent.

**RUSS 7420. Russian Poetry. 3 Credits.**

Survey of readings in Russian poetry from its beginnings to present. Prerequisite: graduate standing.

**RUSS 7430. Russian Drama. 3 Credits.**

Selected readings in and discussions of major Russian plays of the nineteenth and twentieth century. Prerequisite: graduate standing.

**RUSS 7435. Russian Prose. 3 Credits.**

Explores the development of prose writing in modern Russian letters, paying special attention to native generic designations. Considers dual imagery of realist/naturalist and romantic/fantastic approaches. Studies diverse examples: rasskaz (story), the povest' (tale), the novella, novel essay, early 19th c. through 20th c. Considers ways in which literature can itself stand as a philosophical form.

**RUSS 7440. The Russian Novel. 3 Credits.**

Selected readings and seminar discussion of major novelists of the 19th and 20th centuries. Prerequisites: graduate standing.

**RUSS 7520. Nikolai Gogol. 3 Credits.**

Study of the life and art of Nikolai Gogol. Includes biographical overview, Ukrainian stories, dynamics of folklore, local dialect, and the process of literary creation. Considers St. Petersburg stories, novels, and plays. Prerequisite: graduate standing or instructor's consent.

**RUSS 7530. Dostoevsky. 3 Credits.**

Introduction to the works of Fyodor Dostoevsky, including selections from both the shorter works and the major novels. Prerequisite: graduate standing or instructor's consent.

**RUSS 7540. Tolstoy's Fiction and Truth. 3 Credits.**

Provides a conceptual overview and analysis of two masterpieces of Tolstoy's art. Acquaints students with the complex and hidden connections between Tolstoy's artistic methods and religious beliefs. Prerequisites: graduate standing or instructor's consent.

**RUSS 7550. Nabokov's Russian Fiction. 3 Credits.**

Systematic analysis of Vladimir Nabokov's fiction, both novels and short stories. Emphasis on the artistic properties of prose. Lectures and class discussion in English. Readings in Russian. Prerequisite: graduate standing or instructor's consent.

**RUSS 7610. Structure of Modern Standard Russian: Phonology and Morphology. 3 Credits.**

Introduction to the linguistic study of Russian. Introduces students to basic practical and theoretical concepts of phonology and morphology. Students will learn the roles for practical mastery of the Russian verb, and linguistic mastery of the system.

**RUSS 7730. Internship in Russian. 3 Credits.**

Supervised introduction to the methodology of the teaching of elementary Russian; conducted in a classroom environment. Prerequisite: graduate standing or instructor's consent.

**RUSS 7820. Blogging the World: The Web in Cultural Context. 3 Credits.**

(same as German [GERMAN] 7820 and French [FRENCH] 7820). Innovative interdisciplinary course addresses issues of access to international news and specific cultural context. Working in cross-disciplinary teams, students in journalism, foreign language, international studies, political science and various other disciplines track cultural developments and information on non-US Web sites, blogs and digital social networks along with exploring various historical forms of communication that preceded the digital era of the Web. Students analyze the potential and limitations/effects of blogs and the web in specific contemporary cultural contexts and as part of the broader historical evolution of the web. The course is taught in English. The goal of this course is two-fold: students learn the particulars of web blogging, explore various features of the contemporary social network landscape while focusing on the concepts of culture, in particular the cultures of Europe and the US. Questions asked are: what is culture? What is common or popular right now in other cultures? And how do new social networks amplify or alter certain features or culture across national and international contexts?.

**RUSS 7975. Distorted Picture: Post-War Cinema in a Police State. 3 Credits.**

(Same as Film Studies [FILM\_S] 7975) Considers strategies and stylistic devices employed by East European & Soviet directors to produce artistically worthy films under censorship. Discusses how artists adapted methods, boldness of expression, thematic content, and technical sophistication. Attention paid to production techniques. Graduate Standing Required.

**RUSS 8050. Research in Russian. 1-99 Credit.**

Translations or creative work not leading to thesis. Credit hours arranged. Prerequisites: graduate standing and instructor's consent.

**RUSS 8085. Problems in Russian and Slavonic Studies. 1-99 Credit.**

Prerequisite: graduate standing and instructor's consent.

**RUSS 8090. Thesis Research in Russian. 1-6 Credit.**

Independent research leading to a Master's thesis. Prerequisites: graduate standing and instructor's consent. Graded on S/U basis only.

**RUSS 8105. Topics in 19th Century Russian Literature-General. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**RUSS 8205. Topics in 20th Century Russian Literature. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**RUSS 8220. Russian Intellectual History and Critical Theory I. 3 Credits.**

Survey of Russian literary and cultural criticism of the 18th and 19th centuries. Course texts will include representative critical essays as well

as selected literary texts. May be taken before or after Russian [RUSS] 7230. Prerequisites: graduate standing or instructor's consent.

**RUSS 8230. Russian Intellectual History and Critical Theory II. 3 Credits.**

Survey of Russian literary and cultural criticism of the 20th century. Course texts will include representative critical essays as well as selected literary texts. Prerequisites: graduate standing or instructor's consent. May be taken before or after Russian [RUSS] 7220.

**RUSS 8305. Topics in Slavic Linguistics. 1-99 Credit.**

Prerequisites: graduate standing and instructor's consent.

**RUSS 8405. Topics in Slavic Literatures. 1-99 Credit.**

Prerequisite: graduate standing and instructor's consent.

**RUSS 8510. The Art and Life of Pushkin. 3 Credits.**

Gives a conceptual thematic overview of Alexander Pushkin's lyrical poetry, as well as some dramatic work and prose. Special attention paid to the parallel development of his artistic and religious beliefs. Poetry read in Russian; prose and dramatic poems in Russian and English. Prerequisite: graduate standing or instructor's consent.

**RUSS 8560. Old Russian Literature. 3 Credits.**

Considers the genres, periodization, and development of Russian literature from the beginnings of literacy to the end of the Rurikovich dynasty. Emphasis on literary genres and their evolution. Readings in English or in Russian. Prerequisites: graduate standing or instructor's consent.

**RUSS 8570. Russian Symbolism. 3 Credits.**

Study of the history, aesthetics, and creative works associated with the Symbolist movement in Russian literature and art. Primary emphasis on poetry drama, and prose fiction. Prerequisites: and graduate standing or instructor's consent.

**RUSS 8580. Pasternak. 3 Credits.**

Presents the life-long work of Boris Pasternak in three stages: early, interbellum, and late. Special attention to the evolution of poetics, with close analysis of selected poems. Includes theory of poetic expression. Requires a grasp of the main principles of Western versification (prosody, tropes, metaphor, rhyme, euphony), and history of Russian poetry. Prerequisite: graduate standing.

**RUSS 8600. History of the Russian Language. 3 Credits.**

Discusses the development of the Russian language from the origins of Old East Slavic to the present day. Considers the study of the historical phonology of Russian, historical grammar, and the history of the standard languages. Prerequisite: graduate standing or instructor's consent.

**RUSS 8650. Old Church Slavonic. 3 Credits.**

Designed to familiarize student with the phonological system, inflectional morphology and most important literature of the oldest recorded Slavic language. Comparisons of OCS to modern Slavic languages. Prerequisites: graduate standing or instructor's consent.

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## Science and Agricultural Journalism (SCI\_AG\_J)

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**SCI\_AG\_J 1160. Introduction to Science and Agricultural Journalism. 3 Credits.**

Introduction to journalistic writing for print, broadcast, Web. Introduction to writing for public relations. Also includes writing for live Web publication:

cafnrcornerpost.com. Provides overview of career opportunities.  
Prerequisite: instructor's consent.

**SCI\_AG\_J 2150. Problems in Science and Agricultural Journalism. 1-6 Credit.**

For undergraduates majoring in science and agricultural journalism. May be repeated. Prerequisite: instructor's consent.

**SCI\_AG\_J 2210. Communicating Science to the Public. 3 Credits.**

For science majors. Introduction to the history, theory and practice of communicating science to the general public. Emphasis on the interplay of science, human values and politics; also, the art and craft of writing and talking to lay audiences. Prerequisites: ENGLSH 1000 and a declared major in a science or engineering field or instructor's consent. Graded on A/F basis only.

**SCI\_AG\_J 2940. Internships in Science and Agricultural Journalism. 1-3 Credit.**

Prerequisite: instructor's consent, may be repeated for credit.

**SCI\_AG\_J 3201. Topics in Science and Agricultural Journalism. 1-3 Credit.**

Instruction in select subject matter areas in the field of communications. Prerequisite: instructor's consent.

**SCI\_AG\_J 3210. Fundamentals of Communications. 3 Credits.**

Instruction in writing about conflicts in agriculture and the environment and their cultural impacts. Emphasis on media literacy, critical thinking, communication and the interplay of science and human values. Prerequisites: ENGLSH 1000, sophomore standing.

**SCI\_AG\_J 3240. Communicating on the Web. 3 Credits.**

Learn to make a useful, content-driven web site using web authoring software (this is not a programming class). This course emphasizes informative content and functional design.

**SCI\_AG\_J 3385. Problems in Science and Agricultural Journalism. 1-4 Credit.**

Opportunity to apply journalism skills to agricultural subjects; opportunity to integrate communication processes within single medium or across media. Section 1: Corner Post Staff, Section 2: Problems in Science and Agricultural Journalism. Prerequisite: junior standing and instructor's consent. May be repeated.

**SCI\_AG\_J 4301. Topics in Science and Agricultural Journalism - Honors. 1 Credit.**

Instruction in select subject matter areas in the field of communications. Graded on A/F basis only. Prerequisite: JOURN 4450 and Junior standing. Consent of instructor required. Honors eligibility required.

**SCI\_AG\_J 4301H. Topics in Science and Agricultural Journalism - Honors. 1-3 Credit.**

Instruction in select subject matter areas in the field of communications. Graded on A/F basis only. Prerequisite: JOURN 4450 and Junior standing; instructor's consent. Honors Eligibility required.

**SCI\_AG\_J 4414. Field Reporting on the Food System and Environment. 3 Credits.**

(Same as JOURN 4414). Field reporting on the social, political, scientific, economic and ethical dimensions of the food system and environment, with emphasis on explanatory story-telling. Includes multi-day field trip. Prerequisite: consent of instructor. Graded A-F only.

**SCI\_AG\_J 4415. Current Issues in Science Journalism. 3 Credits.**

(Same as JOURN 4415) Focuses on covering the interplay of one or more current issues of concern to journalists, scientists and society. The

focus for any given semester may be biotechnology, climate change, energy, food safety, global population growth, wildlife or another issue. Prerequisites: Journalism [JOURN] 2100 or consent of instructor. Graded on A/F basis only.

**SCI\_AG\_J 4480. Will Write for Food (and Wine). 3 Credits.**

(Same as JOURN 4480) Course focuses on food and wine writing in current U.S. culture. Come ready to create mouthwatering narrative and actively seek publishing your finished work. An emphasis will be placed on class participation and written critiques of peer-reviewed articles in class. Prerequisites: Junior standing, instructor's consent and JOURN 4450. Graded on A/F basis only.

**SCI\_AG\_J 4940. Internships in Science and Agricultural Journalism. 1-3 Credit.**

Prerequisite: instructor's consent, 60 or more credit hours completed. May be repeated for credit.

**SCI\_AG\_J 4970. Agriculture and the Media Senior Seminar Capstone. 3 Credits.**

Provides background, knowledge of trends and experience with agricultural media. Prerequisites: instructor's consent, Science and Agricultural Journalism seniors take last Spring semester before graduation.

**SCI\_AG\_J 7301. Topics in Science and Agricultural Journalism. 1-3 Credit.**

Selected current topics in science and agricultural journalism. Specific topics to be announced at time of registration. Prerequisite: Graduate standing and instructor consent. Course graded on A/F basis only.

**SCI\_AG\_J 7414. Field Reporting on the Food System and Environment. 3 Credits.**

(same as JOURN 7414). Field reporting on the social, political, scientific, economic and ethical dimensions of the food system and environment, with emphasis on explanatory story-telling. Includes multi-day filed trip. Prerequisite: instructor's consent. Graded on A/F basis only.

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## Social Work (SOC\_WK)

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**SOC\_WK 1101. Topics in Social Work. 1-3 Credit.**

Special and emerging topics in social work and social welfare. Subject, content and credit varies depending on available faculty and student interest. For undergraduate students only.

**SOC\_WK 1110. Introduction to the Social Work Major. 1 Credit.**

Students examine their interest in social work and other human service professions; learn of career possibilities in their interest area; and develop an educational plan to reach their goal. Prerequisite: freshman or sophomore standing.

**SOC\_WK 1115. Social Welfare and Social Work. 3 Credits.**

Survey course that examines the history and development of social welfare in the United States and the profession of social work, as well as contemporary issues.

**SOC\_WK 2000. Exploration in Social and Economic Justice. 3 Credits.**

(Same as Peace Studies [PEA\_ST] 2000). This course explores issues of fairness and equality in economic, political and social systems, and applies social justice principles to major social problems. Graded on A/F basis only. Course may be repeated two times for credit.

**SOC\_WK 2101. Topics in Social Work. 1-3 Credit.**

Special and emerging topics in social work and social welfare. Subject, content, and credit varies depending on available faculty and student interest. Prerequisite: consent required.

**SOC\_WK 2220. Human Behavior and the Environment. 3 Credits.**

The first of two required courses providing an introduction to selected theories, multidisciplinary knowledge, and perspectives into human development and behavior. Prerequisite: English [ENGLSH] 1000 or sophomore standing. Graded on A/F basis only.

**SOC\_WK 3101. Topics in Social Work. 1-3 Credit.**

Special and emerging topics in social work and social welfare. Subject, content and credit varies depending on available faculty and student interest. For undergraduate and graduate students. Prerequisite: consent required.

**SOC\_WK 3310. Comparative Social Policy. 2-3 Credit.**

A comparative study of social policy aspects in the framework of international development. Policy areas include South Asia, as well as other regions relevant to such study. Prerequisite: consent required.

**SOC\_WK 3320. Understanding Personality in a Social Context. 3 Credits.**

Introduces students to diverse personality theories and examines background, key concepts, motivation, structure, development dynamics and applications of each theory in a social context. Required of all undergraduate social work majors.

**SOC\_WK 3330. Medical Social Problems. 2 Credits.**

Interrelations of biological, psychological, social factors in understanding people with common physical illnesses. Prerequisites: junior standing and instructor's consent.

**SOC\_WK 3340. Dynamics of Interviewing. 3 Credits.**

Analysis of interviewing techniques employed in communication for securing reliable, valid data to modify behavior in accordance with professional objectives. Prerequisites: junior standing and consent required.

**SOC\_WK 3350. Problems in Social Work. 1-3 Credit.**

Research and independent study projects offered on a tutorial basis to undergraduate social work students. Prerequisites: consent required.

**SOC\_WK 4101. Topics in Social Work. 1-6 Credit.**

Special and emerging topics in social work and social welfare. Subject, content and credit varies depending on available faculty and student interest. Prerequisite: consent required. May be repeated for credit.

**SOC\_WK 4300. Women and Health Care. 3 Credits.**

Provides a study of the role of women as health care providers and an analysis of the impact of value systems and the women's movement on the organization and delivery of health services to women.

**SOC\_WK 4310. Social Statistics. 4 Credits.**

Descriptive, analytic techniques applied to qualitative and quantitative social data. Prerequisite: sophomore standing. Math Reasoning Proficiency Course.

**SOC\_WK 4320. Rural Human Services. 3 Credits.**

A study of the effect of rural and small community environments on the planning and delivery of social and health services. Emphasis on policy and program analyses relevant to rural issues and concerns. Prerequisite: junior standing.

**SOC\_WK 4330. Addiction Treatment and Prevention. 3 Credits.**

Provides knowledge generic to social work and other disciplines involved in substance abuse treatment. Integrated approach to problems of substance abuse and development of self-awareness are emphasized. Didactic and experiential methods employed. Prerequisite: junior standing.

**SOC\_WK 4350. Deaf Culture: A Social Work Perspective. 3 Credits.**

An introduction to the deaf community as a linguistic and cultural minority. Examines the complexities of Deaf culture from a historical and contemporary perspective. Addresses cultural identity, communication, education, social services, civil rights and advocacy. Graded on A/F basis only.

**SOC\_WK 4360. Working with Minority Youth. 3 Credits.**

(same as Black Studies [BL\_STU] 4360). Develops awareness and understanding of social/psychological and cognitive realities influencing the behavior of minority youth. Content draws upon theories, research and practice skills relevant to understanding and counseling minority youth. Prerequisite: junior standing.

**SOC\_WK 4370. Delinquency, Corrections and Social Treatment. 3 Credits.**

Focuses on problems and causative factors in developing and maintaining delinquent and criminal behavior and attitudes: addressing critical and comparative understanding of social change strategies employed in this field. Prerequisite: junior standing.

**SOC\_WK 4380. Social Work Practice With Minorities: African-American Emphasis. 3 Credits.**

(same as Black Studies [BL\_STU] 4380). Provides students with an appreciation of the African-American experience in the United States on a knowledge and feeling level. Prerequisite: junior standing.

**SOC\_WK 4390. Helping Strategies With Children and Adolescents. 3 Credits.**

Theory and practice of work with children and adolescents. Focus on youth in transition, protective services and permanency planning, and special needs populations. Prerequisite: junior standing.

**SOC\_WK 4400. Domestic Violence. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4400). This 3-hour course covers history of battered women's movement, violence theories, policy issues, prevention and intervention practice models for working with battered women, their children, and abusers. Prerequisite: junior standing.

**SOC\_WK 4410. Law and Social Work Practice. 3 Credits.**

Legal processes relevant to social work practice and court procedures, and study of decisions affecting social work across micro and macro practice. Prerequisite: junior standing.

**SOC\_WK 4440. International Social Work Practices and Principles. 3 Credits.**

This course explores issues of fairness and equity in economic, political and social systems, and applies social justice principles to major international social problems. Social Justice is the perspective that in a perfect world, all citizens deserve equal rights, protection, opportunities, obligations and social benefits. Recognizing that the world is not perfect, International Social Work Practice and Principles presents theories and perspectives on how to affect a more just society and world community. Social Work person in environment orientation and strong value system are used as guides in analyzing problems and determining ways of

promoting a more just society and global community. Junior Standing required.

**SOC\_WK 4450. Professional Perspectives on Child Welfare Services in the 21st Century. 3 Credits.**

This course examines the development and current state of child welfare services in America with an emphasis on the role of the public child welfare agency in delivery of those services. It is an overview course which addresses the relationship between practice issues in service delivery and administrative policy issues which enable and constrain service delivery activities. The overarching concepts of child safety, family stability, permanency for the child, and well-being of the child as a long-term outcome will be used to examine the five focal service delivery areas in child welfare; family support, preservation and reunification, child protection, foster placement, residential care, and adoptive services. This is a dual level BSW/MSW course and is an elective within the program's curricular structure. The differentiating objectives and assignments for the MSW members of the class are noted in the appropriate areas of the syllabus.

**SOC\_WK 4455. Latino/a Immigrants and Receiving Communities. 3 Credits.**

This interdisciplinary course is designed to educate students about the Latino/a immigrants seeking better lives and the communities that receive them. Special attention is given to social justice issues; micro, mezzo, and macro systems will be used to explore content.

**SOC\_WK 4480. Helping Strategies with Older Persons. 3 Credits.**

This course is designed to provide knowledge and skill development for work with older adults and their families. It offers an intensive examination of the concepts and skills needed for effective social work practice with these populations. In particular, sociological, psychological, political, and economic factors affecting older adults will be examined as they relate to intervention, programmatic, and policy responses. Special attention will be given to assessment and intervention from macro, mezzo, and micro perspectives. The interrelationship between the aging person, the family, and society is explored since these factors affect all levels of practice. Content in this course related to the social and economic mission of the School of Social Work. Prerequisite: Junior standing in Social Work and instructor's consent.

**SOC\_WK 4710. Social Justice and Social Policy. 3 Credits.**

Based on the concepts of human need and social justice, a historical and analytical approach to social welfare policies and programs. Graded on A/F basis only. Prerequisites: junior standing and consent required.

**SOC\_WK 4711. Social Justice and Social Policy II. 3 Credits.**

Advanced course in the analysis of policies and programs relevant to social work and social welfare. Prepares students to understand and conduct policy analysis of public, voluntary, and proprietary human service organizations. Prerequisites: Social Work [SOC\_WK] 4710. Social Work Professional standing. Graded on A/F basis only.

**SOC\_WK 4720. Variations in Human Behavior. 3 Credits.**

Basic concepts and principles regarding psychological/social dynamics of deviance; implications for social welfare policy and social interventions. Prerequisites: junior standing and consent required.

**SOC\_WK 4730. Introduction to Social Work Practice. 3 Credits.**

Introductory, generalist practice theory course promoting student's understanding of professional social work practice as holistic, identifiable, unique configuration of knowledge, values and skills. Graded on A/F basis only. Prerequisite: Social Work Professional Standing and consent required.

**SOC\_WK 4740. Introduction to Community and Organizational Processes. 4 Credits.**

Introduction to contextual framework of social work practice with particular emphasis on community and organization as social systems. Graded on A/F basis only. Prerequisite: Social Work professional standing and consent required.

**SOC\_WK 4750. Interaction Skills Workshop. 3 Credits.**

Generalist practice at individual, group and community levels. Group communication and social influence theories address generic and unique aspects of interaction across systems. Uses laboratory instruction. Graded on A/F basis only. Prerequisites: Social Work Professional standing and consent required.

**SOC\_WK 4760. Theory and Practice of Social Group Work. 3 Credits.**

Focuses on small group dynamics and models of group work practice suitable in all social work fields. Emphasizes practice theory and skills. Graded on A/F basis only. Prerequisites: Social Work Professional standing.

**SOC\_WK 4770. Strategies of Direct Practice. 3 Credits.**

Examines social structures, processes, underlying assumptions/concepts of social change, client constellation, organizational arrangements, role relationships by which social workers define professional intervention. Prerequisites: Social Work [SOC\_WK] 4730 and 4750; third semester professional program standing; consent required. Co-requisite: SOC\_WK 4971 and 4970.

**SOC\_WK 4951. Research for Social Work Practice. 3 Credits.**

This course introduces social work research and its relevance to practice, emphasizing the School of Social Work's social justice mission. Graded on A/F basis only. Prerequisites: Social Work Professional standing or consent required.

**SOC\_WK 4952. Research Methods for Social Work. 3 Credits.**

Survey of research methods germane to the development of the knowledge base of social work practice. Graded on A/F basis only. Prerequisites: Social Work Professional standing or consent required.

**SOC\_WK 4960. Special Readings in Social Work. 1-3 Credit.**

Extensive readings in selected area or intensive reading in a special field. Prerequisites: consent required.

**SOC\_WK 4970. Senior Professional Seminar. 3 Credits.**

Integrative professional practice seminar for BSW students, focusing on the principles of generic social work and its application to direct practice in diverse fields, career planning and responsibilities. Prerequisite: Social Work [SOC\_WK] 2220, 4710, 4730, 4740, 4750, 4760, and 4720; consent required. Co-requisite: SOC\_WK 4770 and 4970.

**SOC\_WK 4971. Undergraduate Field Practicum. 6 Credits.**

Supervised social work practice in a school-approved agency focusing on development of direct practice skills. Fall semester, three days per week. Prerequisites: senior standing; Social Work [SOC\_WK] 2220, 4710, 4730, 4740, 4750, 4760, and 4720; consent required. Co-requisite: SOC\_WK 4770 and 4970. Graded on S/U basis only.

**SOC\_WK 4971H. Undergraduate Field Practicum - Honors. 6 Credits.**

Supervised social work practice in a school-approved agency focusing on development of direct practice skills. Graded on S/U basis only. Prerequisites: senior standing; SOC\_WK 2220, SOC\_WK 4710, SOC\_WK 4730, SOC\_WK 4740, SOC\_WK 4750, SOC\_WK 4760, and SOC\_WK 4720; consent required. Co-requisite: SOC\_WK 4770 and SOC\_WK 4970. Honors eligibility required.

**SOC\_WK 7001. Topics in Social Work. 1-3 Credit.**

Special and emerging topics in social work and social welfare. Subject, content, and credit varies depending on available faculty and student interest. Prerequisite: graduate standing; consent required.

**SOC\_WK 7085. Problems in Social Work. 1-6 Credit.**

Intensive study of an area of social welfare related to special interest of student. Prerequisites: graduate standing, consent required.

**SOC\_WK 7220. Advanced Social Work Practice in Integrated Healthcare. 3 Credits.**

The course will introduce students to the essential practice skills needed to effectively address the challenges of integrating services, care, and support for persons with health, mental health, and substance use problems. Graded on A-F basis only.

**SOC\_WK 7300. Women and Health Care. 3 Credits.**

Provides a study of the role of women as health care providers and an analysis of the impact of value systems and the women's movement on the organization and delivery of health services to women. Prerequisite: graduate standing.

**SOC\_WK 7310. Social Statistics. 3 Credits.**

Descriptive, analytic techniques applied to qualitative and quantitative social data. Prerequisite: graduate standing.

**SOC\_WK 7320. Rural Human Services. 3 Credits.**

A study of the effect of rural and small community environments on the planning and delivery of social and health services. Emphasis on policy and program analyses relevant to rural issues and concerns. Prerequisite: graduate standing.

**SOC\_WK 7330. Addiction Treatment and Prevention. 3 Credits.**

Provides knowledge generic to social work and other disciplines involved in substance abuse treatment. Integrated approach to problems of substance abuse and development of self-awareness are emphasized. Didactic and experiential methods employed. Prerequisite: graduate standing.

**SOC\_WK 7340. Military Culture. 3 Credits.**

An introduction to the branches of the military and related cultural issues. Examines the historical and contemporary complexities of military service and personal and professional values and ethics related to practice with military personnel, families, and veterans. Graduate Standing Required. Graded on A/F basis only.

**SOC\_WK 7350. Deaf Culture: A Social Work Perspective. 3 Credits.**

An introduction to the deaf community as a linguistic and cultural minority. Examines the complexities of Deaf culture from a historical and contemporary perspective. Addresses cultural identity, communication, education, social services, civil rights, and advocacy. Graded on A/F basis only.

**SOC\_WK 7360. Working with Minority Youth. 3 Credits.**

Develops awareness and understanding of social/psychological and cognitive realities influencing the behavior of minority youth. Content draws upon theories, research and practice skills relevant to understanding and counseling minority youth. Prerequisite: graduate standing.

**SOC\_WK 7370. Delinquency, Corrections and Social Treatment. 3 Credits.**

Focuses on problems and causative factors in developing and maintaining delinquent and criminal behavior and attitudes: addressing critical and comparative understanding of social change strategies employed in this field. Prerequisite: graduate standing.

**SOC\_WK 7380. Social Work Practice With Minorities: African-American Emphasis. 3 Credits.**

Provides students with an appreciation of the African-American experience in the United States on a knowledge and feeling level. Prerequisite: graduate standing.

**SOC\_WK 7390. Helping Strategies With Children and Adolescents. 3 Credits.**

Theory and practice of work with children and adolescents. Focus on youth in transition, protective services and permanency planning, and special needs populations. Prerequisite: graduate standing.

**SOC\_WK 7400. Domestic Violence. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7400). This 3-hour course covers history of battered women's movement, violence theories, policy issues, prevention and intervention practice models for working with battered women, their children, and abusers. Prerequisite: graduate standing.

**SOC\_WK 7410. Law and Social Work Practice. 3 Credits.**

Legal processes relevant to Social Work Practice and Court procedures and study of decisions affecting social work across concentrations.

**SOC\_WK 7420. Social Work and Disasters. 3 Credits.**

Focuses on social work practice, policy and research related to response, recovery and mitigation of technological and natural disasters. Prerequisites: graduate standing, consent required.

**SOC\_WK 7430. Community Organization for Social Welfare. 3 Credits.**

The theory and practice of community organization as a social work problem solving method. Approaches emphasized include locality development, social planning and social action. Prerequisite: graduate standing; consent required.

**SOC\_WK 7450. Professional Perspectives on Child Welfare Services in the 21st Century. 3 Credits.**

This course examines the development and current state of child welfare services in America with an emphasis on the role of the public child welfare agency in delivery of those services. It is an overview course which addresses the relationship between practice issues in service delivery and administrative policy issues which enable and constrain service delivery activities. The overarching concepts of child safety, family stability, permanency for the child, and well-being of the child as a long term outcome will be used to examine the five focal service delivery areas in child welfare; family support, preservation and reunification, child protection, foster placement, residential care, and adoptive services. This is a dual level BSW/MSW course and is an elective within either program's curricular structure. The differentiating objectives and assignments for the MSW members of the class are noted in the appropriate areas of the syllabus.

**SOC\_WK 7455. Latino/a Immigrants and Receiving Communities. 3 Credits.**

This course is designed to educate students about the Latino/a immigrants who come to communities America to work and to seek better lives for themselves and their families whether in the U.S. or in their sending communities. It is also designed to examine the impacts of this immigration on long-time residents of these receiving communities. Special attention will be given to rural areas and social justice issues as they pertain to the newcomers as well as the long-term residents. It will examine the historical and current issues related to Latino/a immigration in the U.S. and in receiving communities in particular. The content will

draw on research, policy, and practice theories and skills relative to the social and environmental context of this phenomenon. This course will address issues related to micro, mezzo, and macro systems pertaining to the Latino/a immigrants and their receiving communities.

**SOC\_WK 7460. Advanced Social Group Work. 3 Credits.**

An intensive exposure to the theories and models of social group work practice through cognitive, affective and experiential (laboratory) methods of teaching/learning. Prerequisites: graduate standing; consent required.

**SOC\_WK 7470. Organizational Issues in Social Work Practices in Child Welfare. 3 Credits.**

Intensive seminar in meso-level practice in the field of child welfare. Examines communication theory, team building, and interorganizational dynamics as they affect professional practice in child welfare. Prerequisites: graduate standing; consent required.

**SOC\_WK 7480. Helping Strategies with Older Persons. 3 Credits.**

Focus on interdisciplinary methods of assessment and intervention strategies designed to optimize healthy functioning for older persons and their families. Prerequisites: graduate standing; consent required.

**SOC\_WK 7485. Military Social Work. 3 Credits.**

An introduction to social work practice with military personnel, veterans, and their families. Content draws on theories strategies, and research relevant to effective social work Practice with this population. Prerequisite: graduate standing. Graded on A/F basis only.

**SOC\_WK 7490. Family Treatment. 3 Credits.**

Comparative study of theories and methods required for work with problems of family functioning. Both conjoint and subsystem approaches to family treatment are examined. Prerequisite: graduate standing; consent required.

**SOC\_WK 7500. Child Custody and Visitation Mediation in Social Work. 3 Credits.**

The course will focus on the social work skills and knowledge required for effective mediation in child custody and visitation. Prerequisites: graduate standing; consent required.

**SOC\_WK 7510. Supervision, Consultation and Staff Training. 3 Credits.**

Philosophy, objectives, principles and methods of social work supervision, staff development and consultation with emphasis on the commonality of the teaching-learning-evaluating functions. Prerequisite: graduate standing; consent required.

**SOC\_WK 7710. Social Policy and Service Delivery in Social Work. 3 Credits.**

Covers historic and contemporary issues in social welfare policy. Focuses on relationships among social problems, public policies, private actions, poverty, racism, sexism and social work practice/values. Graded on A/F basis only. Prerequisites: graduate standing; consent required.

**SOC\_WK 7720. Foundations of Human Behavior. 3 Credits.**

Substantive sources from behavioral sciences used in social work toward understanding the biosocial processes and constraints of human development. Prerequisite: graduate standing; consent required.

**SOC\_WK 7730. Direct Practice. 3 Credits.**

Introduces theory and application of strengths-based generalist practice. Develops knowledge, values, and techniques of professional social work practice at micro, mezzo, and macro levels, emphasizing assessment and interaction skills with individuals and families. Prerequisite: graduate standing in Social Work.

**SOC\_WK 7740. Community and Organization Dynamics. 3 Credits.**

Examination of social environment in which social work is practiced with particular emphasis on development of analytic framework for understanding formal organizations and communities. Prerequisite: graduate standing in Social Work; consent required.

**SOC\_WK 7750. Advanced Interaction Skills Workshop. 3 Credits.**

Advanced class in social processes and interaction skills basic to generalist social work practice. Learning in cognitive, behavioral and affective domains: including group dynamics, communication and social influence theory. Prerequisite: graduate standing in social work; consent required.

**SOC\_WK 7751. Psychosocial Function and Older Adults. 3 Credits.**

(same as Architectural Studies [ARCHST] 7650, Family Community Medicine [F\_C\_MD] 7751, Human Development and Family Studies [H\_D\_FS] 7751, Nursing [NURSE] 7751, Public Health [P\_HLTH], 7751 and Health Management and Informatics [HMI] 7751). This course takes an Interdisciplinary approach to understanding the psychosocial function of older adults and explores approaches to alleviate disabling conditions that interfere with psychosocial function and quality of life in old age. Graded on A/F basis only.

**SOC\_WK 7752. Physical Function and Older Adults. 3 Credits.**

(Same as Family and Community Medicine [F\_C\_MD] 7750, Architectural Studies [ARCHST] 7640, Health Management and Informatics [HMI] 7750, Human Development and Family Studies [H\_D\_FS] 7750, Nursing [NURSE] 7750, and Public Health [P\_HLTH] 7750. This course takes an interdisciplinary approach to understanding and improving the physical function and independence of older adults and explores approaches to alleviate disabling conditions that interfere with physical function and quality of life in old age. Graded A-F only. Graduate Standing Required.

**SOC\_WK 7760. Foundations of Justice. 3 Credits.**

This class will examine the impact of power, oppression and discrimination upon individuals, families, communities, and cultures within a historical and contemporary context and will assist students in examining personal and professional values and ethics related to justice. Graded on A/F basis only.

**SOC\_WK 7770. Strategies of Clinical Social Work Intervention. 3 Credits.**

Strategies of social treatment with individuals and small groups applicable to practice in public and private social agency settings. Prerequisites: graduate standing in social work; consent required.

**SOC\_WK 7780. Fundamentals of Social Work Administration. 3 Credits.**

Basic managerial skills which social workers need for supervision, planning, staff development and administrative positions in social agencies; focus on individual management functions and skills associated with them. Prerequisite: graduate standing; consent required.

**SOC\_WK 7790. Practicum in Cultural Diversity I. 1 Credit.**

A practicum conducted on a workshop with content focused on racial, cultural and gender dynamics in social work practice. Graded on a S/U basis only. Prerequisites: graduate standing; consent required.

**SOC\_WK 7791. Practicum in Cultural Diversity II. 1 Credit.**

Continuation of Social Work [SOC\_WK] 7790. A practicum conducted as a workshop with content focused on racial, cultural and gender dynamics in social work practice. Graded on a S/U basis only. Prerequisites: graduate standing; consent required.



**SOC\_WK 7820. DSM IV and Psychopathology. 3 Credits.**

Examines psychopathology of human behavior within social work context, prevailing diagnostic models (Diagnostic and Statistical Manual of Mental Disorders IV), and historically oppressive categorizations. Prerequisites: Graduate standing; consent required.

**SOC\_WK 7920. Advanced Foundations of Human Behavior for Administrators. 3 Credits.**

Examination of relevant theoretical and behavioral foundations in order that students can acquire the knowledge to function as a social work administrator. Prerequisites: graduate standing; consent required.

**SOC\_WK 7952. Research Methods in Social Work. 3 Credits.**

Examines research methodology and design as applied to the study of social work techniques and problems. Emphasizes differential uses of scientific observation and techniques for developing knowledge and improving practice. Prerequisite: graduate standing; consent required.

**SOC\_WK 7971. Graduate Field Practicum I. 3-6 Credit.**

Supervised social work practice in a school-approved agency providing a full range of interventive experiences. Graded on S/U basis only. Prerequisites: admission to MSW program; Social Work [SOC\_WK] 7710, 7720, 7730, 7740, 7760. Graduate Standing Required. Consent Required.

**SOC\_WK 7981. Professional Development Workshop. 8 Credits.**

Field practicum under intensive faculty instruction for eight weeks prepares the student for entry into the accelerated graduate degree program. Prerequisites: BSW degree and dean's consent.

**SOC\_WK 8000. Issues in Health Care Policy. 3 Credits.**

Graduate seminar focusing on development of skills in social policy analysis. Emphasizes knowledge and analytical perspectives about social policies and health and impacts on various populations. Graded on A/F basis only. Prerequisites: second year graduate standing; consent required.

**SOC\_WK 8001. Topics in Social Work. 1-3 Credit.**

Special and emerging topics in social work and social welfare. Subject, content, and credit varies depending on available faculty and student interest. Prerequisites: graduate standing; instructor's consent. May be repeated for credit.

**SOC\_WK 8010. Child Abuse and Neglect Assessment and Intervention. 3 Credits.**

In-depth exploration of identification of and interventions with abused/neglected children and their families. Examines roles for social work with both victims and perpetrators. Examines how environmental factors affect successful intervention. Prerequisite: Social Work [SOC\_WK] 7770; graduate standing; instructor's consent for non MSW students.

**SOC\_WK 8020. Children's Mental Health and Social Services in Schools. 3 Credits.**

Focuses on diagnosis and assessment of childhood disorders in the DSM-IV-R and appropriate intervention strategies for these disorders. Focuses on interventions in educational settings. Prerequisites: Social Work [SOC\_WK] 7820, 7770; graduate standing and instructor's consent. Graded on A/F basis only.

**SOC\_WK 8030. Client Case Management, Networking, and Advocacy. 3 Credits.**

Examines the key role of clinical case management across all social work client populations. Models of case management for and techniques applicable to those populations will be developed for effective practice.

Prerequisite: Social Work [SOC\_WK] 7770; graduate standing; instructor's consent for non-MSW students. Graded on A/F basis only.

**SOC\_WK 8040. Narrative Approaches to Social Work Practice. 3 Credits.**

This class will enable students to gain knowledge of theory and basic practice skills grounded in narrative therapy. The use of narratives with vulnerable and oppressed populations and creative strategies to evoke narratives are highlighted in this course. Prerequisites: Social Work [SOC\_WK] 7770; graduate standing, departmental consent. Graded on A/F basis only.

**SOC\_WK 8050. Resiliency and Solution-Focused Practice. 3 Credits.**

Focuses on brief therapy approaches to dealing with clinical problems in a time-efficient, clinically effective method. Various approaches to solution-oriented work based in resiliency theory are presented. Stresses client empowerment across the lifespan. Prerequisites: Social Work [SOC\_WK] 7770; graduate level Social Work Majors only. Graded on A/F basis only.

**SOC\_WK 8060. Trauma Practice and Crisis Intervention. 3 Credits.**

Focuses on clinical techniques for social work with trauma survivors. Addressing effects of disasters, personal violence and war are included. Resiliency in survivors is presented as basis for interventions. Prerequisites: Social Work [SOC\_WK] 7770; graduate level Social Work majors only.

**SOC\_WK 8070. Cognitive Behavioral Practice. 3 Credits.**

Focuses on the theory, concepts, and techniques of cognitive behavioral therapies, with a particular emphasis on clinical intervention methods that may be used by the social worker to address specific client needs. Prerequisites Social Work [SOC\_WK] 7770, graduate standing; consent required. Graded on A/F basis only.

**SOC\_WK 8090. Master's Research in Social Work. 1-6 Credit.**

Independently conducted research that includes concept development, data collection, statistical analysis and social policy implications prepared in a format suitable for publication. Graded on S/U basis only. Prerequisite: graduate standing; consent required.

**SOC\_WK 8100. Mental Health Policies and Programs. 3 Credits.**

Focus is on knowledge of the content, context, history and current trends in mental health policymaking at federal and state levels, and skill building in policy analysis. Graded on A/F basis only. Prerequisite: graduate standing; consent required.

**SOC\_WK 8200. Family and Child Welfare Policies and Programs. 3 Credits.**

Graduate seminar on policies and programs relevant to social work practice in the family and child welfare field, including policies on aging. Prerequisite: graduate standing; consent required.

**SOC\_WK 8210. Disability Rights Advocacy. 3 Credits.**

Highlights historical views of disabilities in relationship to contemporary policies, programs and services. This cross-disability focus examines the shift in focus from cure, care, and treatment to participation, capabilities, adapting environments, and building community. Prerequisite: graduate standing. Graded on A/F basis only.

**SOC\_WK 8220. Integrated Health Policy and Services. 3 Credits.**

The course focuses on the role of social workers as social policy practitioners within an Integrated Behavioral Health environment. Strategies to influence policies and promote change in the interest of service consumer, agency, and society will be presented. Graded on A-F basis only.

**SOC\_WK 8230. Women, Poverty, and Mental Health. 3 Credits.**

Highlights the historical regulations of women's lives in the U.S. Examines women's poverty, mental health, and work, particularly the impact mental health has on the ability of poor women to be breadwinner and nurturer. Compares and contrasts related social welfare policies. Prerequisite: graduate standing. Graded on A/F basis only.

**SOC\_WK 8250. Equity and Disparities in Health. 3 Credits.**

(same as Public Health [P\_HLTH] 8250). This course is designed to provide students with knowledge about the distribution, causes, and consequences of health inequalities. The course will examine how multiple predictors such as socioeconomic status, behavioral risk factors, and cultural factors such as perceived discrimination and acculturation, gender and marriage, stigma, and health care inequalities are related with racial/ethnic, socioeconomic, and gender disparities in health. This course will also discuss implications that may contribute substantively toward the elimination of health inequalities. Prerequisites: Social Work [SOC\_WK] 7710, 7720, 7730, 7740 and 7760; Instructor's consent. Graded on A/F basis only.

**SOC\_WK 8300. Advanced Social Policy for Planning and Administration. 3 Credits.**

Focus on integration of cognitive and skill components of policy development, analysis and change with special emphasis on utility by social work administrators and planners. Prerequisite: Social Work [SOC\_WK] 7920; graduate standing; consent required.

**SOC\_WK 8350. Management of a Social Agency. 3 Credits.**

Basic resource management and control techniques common to social agencies with emphasis on personnel management, information and data management, and fiscal management. Prerequisites: graduate standing; consent required.

**SOC\_WK 8952. Evaluative Research in Clinical Social Work Practice. 3 Credits.**

Develop ability to systematically evaluate effectiveness of interventive strategies designed to produce positive change in clients' environment and/or cognitive, affective and behavioral functioning. Prerequisite: Social Work [SOC\_WK] 7952; graduate standing; consent required.

**SOC\_WK 8953. Evaluative Research in Social Work Planning and Administration. 3 Credits.**

Develop ability to design and implement appropriate evaluative research methods and strategies employed in social and human service program planning and management. Prerequisite: Social Work [SOC\_WK] 7952; graduate standing; consent required.

**SOC\_WK 8955. Independent Study in Social Work. 1-6 Credit.**

Intensive investigation of phenomena germane to area of concentration carried out with guidance of faculty. May include data collection; leads to a written report in publishable format. Prerequisite: graduate standing and consent required.

**SOC\_WK 8970. Professional Practice Seminar I. 3 Credits.**

Provides integrative learning experience in social work practice in an area of beginning specialization in autonomous social work practice. Prerequisites: graduate standing; consent required. Corequisite: Social Work [SOC\_WK] 8971.

**SOC\_WK 8971. Graduate Field Practicum II. 1-13 Credit.**

Field instruction tailored to concentration interests, developing depth in clinical skills in direct service or in planning and administration. Graded on S/U basis only. Prerequisites: completion of all required graduate

coursework except Social Work [SOC\_WK] 8970; consent required. Co-requisite: SOC\_WK 8970.

**SOC\_WK 8990. Topics in Advanced Social Welfare. 3 Credits.**

Topics in Advanced Social Welfare. Consent of instructor required. Graduate standing required.

**SOC\_WK 9001. Topics in Social Work. 1-3 Credit.**

Special and emerging topics in social work and social welfare. Subject, content, and credit varies depending on available faculty and student interest. Prerequisite: graduate standing; consent required. May be repeated for credit.

**SOC\_WK 9090. Research in Social Work. 1-12 Credit.**

Graded on S/U basis only.

**SOC\_WK 9100. Knowledge Building I. 3 Credits.**

Advanced systemic review of theories requisite for study and implementation of practice and policy centered research in social welfare and development; emphasis placed on critical analysis of theories needed for research and study of integrated social development. Prerequisite: graduate standing; consent required.

**SOC\_WK 9200. Knowledge Building IIA. 3 Credits.**

Building on the foundation laid in Social Work [SOC\_WK] 9100, in depth examination of human development and social environment theories appropriate to scientific examination of social welfare practice with individuals, families, formed and natural groups. Prerequisite: graduate standing; consent required.

**SOC\_WK 9300. Research Methodology and Design Seminar. 3 Credits.**

Review of historical development of social welfare and social work research with emphasis on critical analysis of seminal studies; examination of "state-of-the-art" social welfare and development initiatives, designs and methodology. Prerequisite: graduate standing; consent required.

**SOC\_WK 9400. Macro Social Theory. 3 Credits.**

(Same as Nursing [NURSE] 9400). Building on the foundation laid in Social Work [SOC\_WK] 9100, in depth examination of human development and social environment theories appropriate to scientific examination of social welfare practice with formal organizations, interorganizational combinations, communities and larger political entities. Prerequisite: graduate standing; consent required.

**SOC\_WK 9500. Pro Seminar I. 3 Credits.**

Joint student-faculty exercise in intellectual discovery focusing on current and emerging issues in the field of social work and social development; emphasis on integration of multi-disciplinary perspectives. Prerequisite: graduate standing; consent required.

**SOC\_WK 9560. Qualitative Systematic Reviews. 3 Credits.**

(Same as Nursing [NURSE] 9560 and Human Development and Family Studies [H\_D\_FS] 9560) Examine and carry out elements of qualitative systematic reviews: topic/problem identification, data collection, and analysis. Understand how to limit threats to validity and maximize generalizability. Prerequisite: Nursing [NURSE] 9420 or equivalent.

**SOC\_WK 9600. Professional Seminar II. 3 Credits.**

Professional Seminar II.

**SOC\_WK 9700. Social Welfare Policy Seminar. 3 Credits.**

(Same as Nursing [NURSE] 9700) Critical examination of comparative models of social policy development; preparation of a professional social work policy analysis in the student's area of interest/specialization that is

suitable for submission to an appropriate referred journal. Prerequisite: graduate standing; consent required.

**SOC\_WK 9800. Research Application I. 3 Credits.**

Research practicum for Social Work doctoral students. Prerequisites: graduate standing; consent required.

**SOC\_WK 9850. Research Application II. 3 Credits.**

Research Practicum. In most cases it will be a second research practicum but may also be a continuation of the research conducted in Social Work [SOC\_WK] 9800. Prerequisite: graduate standing; consent required.

**SOC\_WK 9890. Dissertation Seminar. 3 Credits.**

This course will assist doctoral students in planning and writing the dissertation. Prerequisite: graduate standing; consent required.

**SOC\_WK 9900. Doctoral Dissertation Research in Social Work. 1-99 Credit.**

Independently conducted research that includes concept development, data collection, statistical analysis and social policy implications prepared in a format suitable for publication. Graded on S/U basis only. Prerequisite: graduate standing; consent required.

## Sociology (SOCIOL)

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**SOCIOL 410RE. AGING CONTEMPORARY SOC. 1-99 Credit.**

**SOCIOL 1000. Introduction to Sociology. 1-3 Credit.**

Nature of organization and activities of human groupings-family, community, crowd, social class, etc.; structure, function of institutions; social influences shaping personality, behavior, social change. No credit for both Sociology [SOCIOL] 1000 and Rural Sociology [RU\_SOC] 1000.

**SOCIOL 1000H. Introduction to Sociology Honors. 3 Credits.**

Nature of organization and activities of human groupings-family, community, crowd, social class, etc.; structure, function of institutions; social influences shaping personality, behavior, social change. No credit for both Sociology [SOCIOL] 1000 and Rural Sociology [RU\_SOC] 1000. Honors eligibility required.

**SOCIOL 1120. Population and Ecology. 3 Credits.**

(same as Rural Sociology [RU\_SOC] and Peace Studies [PEA\_ST] 1120). Changes in the structure and characteristics of population groups and their relationship to both human and non-human aspects of the biophysical environment.

**SOCIOL 1360. The Female Experience: Body, Identity, Culture. 3 Credits.**

(same as Women's and Gender Studies [WGST] 1360). Study of the experience of being female in American culture. Course will focus on development of women's identities through such topics as: sexuality, reproduction, self-image, rape and health care.

**SOCIOL 1650. Social Deviance. 3 Credits.**

Survey of approaches to the study of behaviors commonly regarded as deviant such as crime, sexual abuse, substance abuse, mental illness, etc.

**SOCIOL 2103. Topics in Sociology-Behavioral Science. 1-3 Credit.**

Organized study of selected topics. Particular topics may vary from semester to semester. Departmental consent for repetition.

**SOCIOL 2182. Critical Dialogues: Nonviolence in Peace/Democracy Movements. 3 Credits.**

(same as Peace Studies [PEA\_ST] 2182). History and theory of nonviolent action. Study of such cases as Gandhi's Independence, American Civil Rights and Polish Solidarity movements. Prerequisites: PEA\_ST 1050 or instructor's consent.

**SOCIOL 2200. Social Inequalities. 3 Credits.**

(same as Black Studies [BL\_STU] 2200). Survey of inequalities based upon criteria such as race, ethnicity, sex, age, religion and social class in contemporary societies. Focus on dynamics by which privilege and inequalities are structured.

**SOCIOL 2210. The Black Americans. 3 Credits.**

(same as Black Studies [BL\_STU] 2210). Analysis of history of blacks in the United States. Assessment of contemporary black community in terms of its institutions, styles of life, patterns of work and intergroup relations.

**SOCIOL 2230. Social Perspectives on Aging. 3 Credits.**

Survey of basic knowledge in social gerontology, aging and old age in American society. Analysis of changes as individuals age, differences among old people, social problems of the aged. Prerequisites: Sociology [SOCIOL] 1000 or equivalent.

**SOCIOL 2280. Race, Democracy, and Violence in Cuba and Haiti. 3 Credits.**

(same as PEA\_ST 2280). A sociological approach to understand race/ethnicity, identity, citizenship, human rights, violence, and political and economic systems in the Caribbean. Comparisons of the culture, politics, and historical trajectories of Cuba and Haiti using Post-Colonial and Feminist theories. Graded on A-F basis only.

**SOCIOL 2281. Nuclear Weapons: Environmental, Health and Social Effects. 3 Credits.**

(same as HLTH\_SCI 2200 and PEA\_ST 2200). Environmental consequences of the nuclear arms race, "regional" nuclear war, and weapons testing for human health, agriculture, and society. Examining "a world without nuclear weapons"; political dialogue on proliferation; Iran, North Korea, and nuclear weapons conventions. Graded on A-F basis only.

**SOCIOL 2284. Critical Dialogs: Global Environmental Policy Conflicts. 3 Credits.**

(same as Peace Studies [PEA\_ST] 2284). Climate change, water supplies, food, sustainability, industrialization, and chemical, oil, radioactive pollution. Activity of transnational corporations, social harm, and formulation of international policies. Analysis of alternatives using criteria of justice: distribution, recognition, participation, legality.

**SOCIOL 2285. Large Corporations, Economic Crisis, Social Responsibility. 3 Credits.**

(same as PEA\_ST 2285). Institutional power of the corporate CEO; ethical regulatory restraint. Historical contexts of economic crisis. Theories of justice, alternative concepts of justice in popular culture. Politics of policy issues in prosecution and criminalization of corporate behavior. Graded on A-F basis only.

**SOCIOL 2300. Self and Society. 3 Credits.**

Analysis of the self in modern society. Topics covered include social interaction, social perception, language and learning, the sociology of emotions and the social construction of identity.

**SOCIOL 2310. Culture and Mass Media. 3 Credits.**

Sociological study of modern folk, local, popular and mass cultural production and consumption; mass media, diffusion, change, differentiation.

**SOCIOL 2950. Social Research I. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 2950). Introduction to principles of methodology; theory and research; survey of basic research designs and perspectives; preparation for understanding and conducting social research. Required for Sociology majors.

**SOCIOL 3000. Urban Sociology. 3 Credits.**

Urbanism as a world phenomenon; ecological, demographic characteristics of cities; organization of urban society including status systems, occupational structure, formal and informal associations, racial and cultural relations, forms of communication, housing, city planning.

**SOCIOL 3010. Social Problems. 3 Credits.**

Trends in modern societies: urbanization, occupational structure, technological change, etc. as these have produced alienation and legitimacy problems. Political, economic, health, welfare, military, justice institutions may be considered. Counter movements and policy issues.

**SOCIOL 3100. Recent Theories in Sociology. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 3100). Introduction to major theoretical positions and issues in contemporary American sociology. Logical and intellectual structure of major theoretical schools: functionalism, conflict, exchange, symbolic interaction, phenomenological-ethnomethodological theories. Prerequisite: Sociology [SOCIO] 2200.

**SOCIOL 3200. Class, Status, and Power. 3 Credits.**

Study of the structure of wealth, poverty, prestige, and power. Concepts of social justice in political, economic and legal issues and policies. Provides student engagement in research.

**SOCIOL 3210. Sociology of Globalization. 3 Credits.**

Globalization's origin and dynamics; the social and political effects of globalization: countervailing forces to economic globalization, in particular reassertions of "traditional" identities, labor movements, new social movements, and the global democracy movement.

**SOCIOL 3230. Education and Social Inequalities. 3 Credits.**

Examination of the ways in which inequalities are constructed, reproduced, maintained or transformed by and within educational institutions. Particular attention will be given to inequalities based on gender, race, and social class.

**SOCIOL 3255. Youth in Today's World. 3 Credits.**

Study of what factors influence the development of youth in today's society. Examined are types of behavior such as mating, deviance and the role of schools, parents, TV and friendship groups.

**SOCIOL 3300. Queer Theories/Identities. 3 Credits.**

(same as Women's and Gender Studies [WGST] 3300). Analysis of gay, lesbian, bisexual, transgender (glbt) and queer identities in culture and society with an emphasis on the contributions of queer theory and other glbt standpoint theories to sociology and the study of society. Prerequisite: Sociology [SOCIO] 2200 or instructor's consent.

**SOCIOL 3310. Social Psychology. 3 Credits.**

Survey of theories and research concerned with the ways in which individuals construct social situations and are affected by them. Topics covered include self-identities, social influence, personal relationships, prejudice and discrimination.

**SOCIOL 3320. Sociology of Gender. 3 Credits.**

(same as Women's and Gender Studies [WGST] 3320). Study of the ways in which femininities and masculinities are constructed in American society with particular attention to gender ideologies and the gendered nature of the social structure.

**SOCIOL 3330. Environmental Justice. 3 Credits.**

Environmental justice refers to the ways in which the "cost and benefits" of modern industrial society are distributed among social groups. This course is concerned with justice, not as an abstract concept, and inequality not in terms of numbers in a bank account. Social justice or inequality are lived, embodied experiences. An individual's likelihood of experiencing environmental harm is related to intersecting gender, race and class formations, among other things. Justice or inequality is not only embodied, it also happens in places--national and regional differences matter. In this course we will look at some of the extensive literature documenting the ways in which communities of color and poor communities are subject to disproportionate environmental risks. In addition, we will focus on gender as an important category in understanding environmental inequality.

**SOCIOL 3400. Politics of the Media. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3400). In this course we study critical thinking skills and use them to compare and contrast U.S. media coverage of current issues with media in other parts of the world. Graded on A/F basis only.

**SOCIOL 3420. The Family. 3 Credits.**

Families, kin and households as interacting groups; roles, socialization, problems, structural change; family in relation to other social institutions; historical, cultural and class variations.

**SOCIOL 3430. The Sociology of Sport. 3 Credits.**

The role of sport in modern society. Includes violence in sport; politics and economics of sport; male, female, and racial inequalities; and international comparisons of sport structures.

**SOCIOL 3440. Sociology of Health. 3 Credits.**

A survey of sociological thinking and research on health, health problems, health occupations and health services. How these are shaped by the society. Problems faced by individuals and the system. Potential solutions to problems.

**SOCIOL 3450. The Sociology of Religion. 3 Credits.**

Sociology of religious experience, action, organization, movements and social change; contemporary trends, including mainline and new religions, civil religion, secularization.

**SOCIOL 3460. Technology and Society. 3 Credits.**

In the last few decades science and technology have permeated our lives as never before. This has led to wide ranging intellectual debates and social movements in and around the issue of relationship between science, technology, and society. This course, which is organized on a lecture-seminar format, will critically investigate different aspects of the relationship between science, technology, and society. Graded on A/F basis only.

**SOCIOL 3510. Public Opinion and Communication. 3 Credits.**

Nature of public opinion; processes of opinion formation; special publics, pressure groups; effects of communication through personal contacts and mass media; propaganda, censorship; opinion surveying.

**SOCIOL 3520. Collective Behavior. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3520). Analysis of crowd behavior and related phenomena: rumors, disasters, fashions. Social responses

to unclear, dangerous or unjust conditions. The dynamics of conflict, consensus and change.

**SOCIOL 3522. New Media, Conflict and Control. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3522). This course will explore the increasing role of new media tools in conflict and surveillance. Examples from recent conflicts will illustrate how citizens and regimes use new media to communicate, report, mobilize, monitor, and/or control. Students will utilize new media as they research instances of democracy and control.

**SOCIOL 3600. Criminology. 3 Credits.**

(same as Peace Studies [PEA\_ST] 3600). Sociology of law; constitutional, psychological, sociological theories of criminal behavior; process of criminal justice; treatment of corrections; control of crime.

**SOCIOL 3700. Organizations and Institutions. 3 Credits.**

Social organization of modern societies with focus on complex organizations (corporations, bureaucracies) within institutional arrangements (economy, polity, education, religion); organizational structure; interorganizational networks; interrelations of institutional sectors.

**SOCIOL 3710. The Sociology of Work. 3 Credits.**

Analysis of occupational, professional aspects of American society. Division of labor; occupational mobility; work and the self; collegueship and informal organizations of work. Prerequisites: Sociology [SOCIOL] 1000 or 1650.

**SOCIOL 4100. Expert Systems. 3 Credits.**

Introduction to the use of expert system shells, designed for graduate students from any department. Students create prototype expert systems under close supervision by faculty experts. Prerequisite: junior standing or instructor's consent.

**SOCIOL 4104. Topics in Sociology-Social Science. 3 Credits.**

Organized study of selected topics. Particular topics may vary from semester to semester. Departmental consent for repetition.

**SOCIOL 4110. Feminist Research and Criticism. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4110). Examination of both feminist critiques of traditional social research and recent, feminist-oriented research that attempts to answer these criticisms. Prerequisites: Sociology [SOCIOL] 2950 or equivalent.

**SOCIOL 4120. Social Statistics. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 4120). Descriptive statistics and bivariate quantitative analysis techniques commonly used by social scientists. Includes coverage of parametric and non-parametric methods. Introduction to computer analysis. Prerequisite: Sociology [SOCIOL] 2950 or graduate standing.

**SOCIOL 4200. Social Inequalities. 3 Credits.**

Examination of theories and research concerned with inequalities based on social class, gender, and race-ethnicity. M.A. core course for sociology students. Prerequisite: graduate standing or instructor's consent.

**SOCIOL 4210. Sociology of Aging. 3 Credits.**

Sociological research and theories of aging and old age; historical, demographic, comparative, social psychological and structural topics are studied in depth. Prerequisites: 6 hours of Sociology and junior standing.

**SOCIOL 4220. Race and Ethnic Relations. 3 Credits.**

The experience of racial and ethnic minorities; inequality, assimilation, ethnic and racial conflict, accommodation. Prerequisite: junior standing or instructor's consent.

**SOCIOL 4230. Women, Development, and Globalization. 3 Credits.**

(same as Black Studies [BL\_STU] 4230 and Women's and Gender Studies [WGST] 4230 and Peace Studies [PEA\_ST] 4230). Examines the history and structure of "development" discourse and practices. Stresses the interconnections and impact on women globally. Reviews women's strategies in defining and instituting programs to improve quality of life in communities. Prerequisites: BL\_STU 1332, 2200; SOCIOL 2200; WGST 1332 or 2010.

**SOCIOL 4300. Death and Dying. 3 Credits.**

Death and dying explored from demographic, sociological and social psychological perspectives. Topics: trends and differentials; definitions of death; dying as a social process; funerals and survivors; cultural solutions to problems of death. Prerequisite: junior standing or instructor's consent.

**SOCIOL 4310. Advanced Social Psychology. 3 Credits.**

Major theoretical fields and their application to human problems. M.A. core course. Prerequisite: Sociology [SOCIOL] 3310 or graduate standing.

**SOCIOL 4315. Social Demography. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 4315). General demographic theories; age, sex, and ethnic composition of population; fertility, mortality and migration as components of population change; social, economic and political implications of demographic trends. Prerequisites: Sociology [SOCIOL] 1000 or RU\_SOC 1000 and junior standing.

**SOCIOL 4320. Culture, Identity and Interaction. 3 Credits.**

Examines the interplay between culture, identity, and interaction as these intersect with issues of social inequality, social control, social change, and the everyday production of subjectivities. Prerequisites: Sociology [SOCIOL] 3310 graduate standing or instructor's consent.

**SOCIOL 4335. Social Change and Development. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 4335). Nature of social change and development. Emphasizes sociological theories of social change and development contrasting them with approaches from the disciplines. Prerequisites: Rural Sociology [RU\_SOC] or Sociology [SOCIOL] 1000 and junior standing.

**SOCIOL 4370. Environment and Society. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 4370). An interdisciplinary examination of domestic and international environmental issues focusing on social, cultural, and policy dimensions. Perspectives of the social sciences and humanities are included. Prerequisites: junior, senior or graduate standing.

**SOCIOL 4400. Sociology of Health Systems. 3 Credits.**

Analyzes organization of U.S. health system and systems in the developed and developing world. Special attention to reform movements, universality, effectiveness, quality, and efficiency. Prerequisite: Sociology [SOCIOL] 2950, 3440, and 3100 or graduate standing.

**SOCIOL 4410. Sociology of Education. 3 Credits.**

(same as Educational Leadership and Policy Analysis [ED\_LPA] 7458). Contexts, structures and processes of schooling; effects on class, race, ethnicity and gender; social change, educational policy, and organizational dynamics; higher education and the economy. Prerequisites: Sociology [SOCIOL] 1000 or equivalent.

**SOCIOL 4500. Sociology of Social Policy. 3 Credits.**

Sociological theories and methodologies focused on social policy; policy as process; contextual and critical policy analyses; assessing policy effects and consequences. Prerequisite: senior standing.

**SOCIOL 4510. Social Movements and Conflicts. 3 Credits.**

Survey of approaches and research on social movements and social change. Historical and contemporary social movements in the U.S.; collective protest and violence; political revolutions. MA core course. Prerequisite: Sociology [SOCIOL] 3520, 3700, or 3320 or graduate standing.

**SOCIOL 4520. Political Sociology. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4520). Social bases of power and politics, economic and political elites, the political economy of the advanced societies, sources of political conflict and change. Prerequisite: Sociology [SOCIOL] 3200, 3510, 3520, or 3700.

**SOCIOL 4530. Social Organization of the Industrial Societies. 3 Credits.**

The organizational and interorganizational structure of modern capitalist and socialist societies, including examination of alternative models such as technocracy, bureaucratic society, state capitalism, state socialism, organized capitalism. Prerequisites: Sociology [SOCIOL] 3700 or 3710.

**SOCIOL 4550. Gender and Human Rights in Cross Cultural Perspective. 3 Credits.**

(same as Women's and Gender Studies [WGST] 4550 and Peace Studies [PEA\_ST] 4550). This course focuses on the global discourse on human rights and gender, emphasizing cross-cultural theories. Course includes the meaning of rights, Western and nonwestern perspectives, feminist contributions, important substantive debates, violations, policymaking and activism. Prerequisites: WGST 1120 or Sociology [SOCIOL] 2200; senior standing required.

**SOCIOL 4600. Contemporary Corrections. 3 Credits.**

Development of concepts of punishment, treatment. Contemporary penal and correctional institutions; problems of custody, classification, education, industry and treatment program; probation, parole. Prerequisites: Sociology [SOCIOL] 2200 and 3600.

**SOCIOL 4610. Society and Social Control. 3 Credits.**

The concept of social control is analyzed from both micro and macro theoretical perspectives. Focus is on patterns of social domination. Prerequisite: Sociology [SOCIOL] 3700 or 3710.

**SOCIOL 4620. Drugs and Society. 3 Credits.**

Course will examine the social, political, and economic aspects of legal and illegal drug use in American society. Issues include: theories of drug use, the social correlates of drug use, the war on drugs and policy alternatives, and the rise of the pharmaceuticals industry. Graded on A/F basis only.

**SOCIOL 4630. Sociology of Mental Health. 3 Credits.**

Course examines the social aspects of mental health and illness. Topics include: stress and mental health, medicalization of behavior, stigma and labeling, mental health care systems, social correlates of mental health (such as gender, childhood, work status, and social support). Prerequisites: 1000 level sociology course or 1000 level Psychology course.

**SOCIOL 4700. Social Organization. 3 Credits.**

Survey of approaches to the analysis of social organization emphasizing complex organizations, division of labor, social inequality, politics and the state, social change. MA core course. Prerequisite: Sociology [SOCIOL] 3700 or 3710 or graduate standing or instructor's consent.

**SOCIOL 4940. Internship in Sociology. 1-9 Credit.**

Professional experience under faculty supervision. Project must be arranged by student and faculty member prior to registration. Prerequisites: junior standing and instructor's consent.

**SOCIOL 4942. Service Learning in Sociology. 3 Credits.**

Students participate in a variety of research-oriented, community service projects which illuminate and reinforce concepts introduced in various sociology courses. Repeatable twice for credit. Does not meet A&S general education requirements. Prerequisite: instructor's consent.

**SOCIOL 4960. Special Readings in Sociology. 1-99 Credit.**

Extensive reading in selected area or special field. Prerequisites: 12 hours Sociology & departmental consent.

**SOCIOL 4970. Senior Seminar. 3 Credits.**

Integrates perspectives, methods, substantive foci of undergraduate courses. Analysis of sociology as a discipline and profession. Discussion of opportunities for graduate study, employment. Prerequisite: Sociology [SOCIOL] 2950 and 3100 and senior sociology major.

**SOCIOL 4995. Honors in Sociology. 3 Credits.**

Intensive work in a selected field within sociology, including readings and research. Repeatable up to 6 hours with departmental consent. Prerequisites: for honors candidates; Sociology [SOCIOL] 2950 and 3100.

**SOCIOL 7004. Topics in Sociology-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated with departmental consent. Prerequisites: junior standing and instructor's consent.

**SOCIOL 7085. Problems in Sociology. 1-99 Credit.**

Directed research not leading to thesis or dissertation. Prerequisites: 12 hours Sociology & departmental consent.

**SOCIOL 7100. Expert Systems. 3 Credits.**

Introduction to the use of expert system shells, designed for graduate students from any department. Students create prototype expert systems under close supervision by faculty experts. Prerequisite: graduate standing and departmental consent.

**SOCIOL 7110. Feminist Research and Criticism. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7110). Examination of both feminist critiques of traditional social research and recent, feminist-oriented research that attempts to answer these criticisms. Prerequisites: graduate standing.

**SOCIOL 7120. Social Statistics. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 7120). Descriptive statistics and bivariate quantitative analysis techniques commonly used by social scientists. Includes coverage of parametric and non-parametric methods. Introduction to computer analysis. Prerequisite: Sociology [SOCIOL] 2950 and graduate standing.

**SOCIOL 7200. Social Inequalities. 3 Credits.**

Examination of theories and research concerned with inequalities based on social class, gender, and race-ethnicity. M.A. core course for sociology students. Prerequisite: graduate standing or instructor's consent.

**SOCIOL 7210. Sociology of Aging. 3 Credits.**

Sociological research and theories of aging and old age; historical, demographic, comparative, social psychological and structural topics are studied in depth. Prerequisites: 6 hours of Sociology and graduate standing.

**SOCIOL 7220. Race and Ethnic Relations. 3 Credits.**

The experience of racial and ethnic minorities; inequality, assimilation, ethnic and racial conflict, accommodation. Prerequisites: Sociology [SOCIOL] 1000 or equivalent and graduate standing.

**SOCIOL 7230. Women, Development and Globalization. 3 Credits.**

(same as Women's and Gender Studies [WGST] 7230). Examines the history and structure of "development" discourse and practices. Stresses the interconnections and impact on women globally. Reviews women's strategies in defining and instituting programs to improve quality of life in communities. Prerequisites: graduate standing.

**SOCIOL 7287. Seminar in Comparative Social Institutions. 3 Credits.**

Analysis of selected social institutions such as agriculture, family, economy, education, health care, law, polity, religion. Inter-institutional and international comparisons. Prerequisites: Sociology [SOCIOL] 4700 or instructor's consent.

**SOCIOL 7300. Death and Dying. 3 Credits.**

Death and dying explored from demographic, sociological and social psychological perspectives. Topics: trends and differentials; definitions of death; dying as a social process; funerals and survivors; cultural solutions to problems of death. Prerequisite: graduate standing and instructor's consent.

**SOCIOL 7310. Advanced Social Psychology. 3 Credits.**

Major theoretical fields and their application to human problems. Prerequisite: Sociology [SOCIOL] 3310 or graduate standing.

**SOCIOL 7315. Social Demography. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 7315). General demographic theories; age, sex, and ethnic composition of population; fertility, mortality and migration as components of population change; social, economic and political implications of demographic trends. Prerequisites: Sociology [SOCIOL] 1000 or Rural Sociology [RU\_SOC] 1000 and graduate standing.

**SOCIOL 7320. Culture, Identity and Interaction. 3 Credits.**

Examines the interplay between culture, identity, and interaction as these intersect with issues of social inequality, social control, social change, and the everyday production of subjectives. Prerequisites: Sociology [SOCIOL] 3310 graduate standing or instructor's consent.

**SOCIOL 7335. Social Change and Development. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 7335). Nature of social change and development. Emphasizes sociological theories of social change and development contrasting them with approaches from the disciplines. Prerequisite: Rural Sociology [RU\_SOC] or Sociology [SOCIOL] 1000 and graduate standing.

**SOCIOL 7340. Self, Language, and Social Life. 3 Credits.**

Examines the interplay between self, language, and social life. Particular attention is paid to how the everyday construction of inner lives relates to diverse social worlds. The effects of situational and institutional conditions as they shape identity and social interactions are important considerations. Prerequisite: graduate standing.

**SOCIOL 7370. Environment and Society. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 7370). An interdisciplinary examination of domestic and international environmental issues focusing on social, cultural, and policy dimensions. Perspectives of the social sciences and humanities are included. Prerequisites: graduate standing.

**SOCIOL 7387. Seminar in Sociology of Work. 3 Credits.**

Recent developments in the sociological study of occupations and professions. Surveys alternative theoretical perspectives

and methodological approaches. Deals with rationalization, professionalization, alienation, class consciousness, self management.

**SOCIOL 7400. Sociology of Health. 3 Credits.**

Comparative study of disease, illness and health care systems in the US and other nations. Prerequisites: Sociology [SOCIOL] 3100 and 3440 or Graduate Standing. Graded A-F only.

**SOCIOL 7410. Sociology of Education. 3 Credits.**

(same as Educational Leadership and Policy Analysis [ED\_LPA] 7458). Contexts, structures and processes of schooling; effects on class, race, ethnicity and gender; social change, educational policy, and organizational dynamics; higher education and the economy.

**SOCIOL 7446. Community Social Structure. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 7446). A comparative study of communities in different nations and in urban and rural areas. A primary focus of the course will be on social change in communities, in response to changing economic, political, social, cultural, and ecological factors.

**SOCIOL 7487. Seminar in Sociology of Organizations. 3 Credits.**

Recent developments in the sociological analysis of complex organizations, including corporations, public bureaucracies, educational organizations, religious organizations, etc. Surveys alternative theoretical perspectives and methodological approaches.

**SOCIOL 7500. Sociology of Social Policy. 3 Credits.**

Sociological theories and methodologies focused on social policy; policy as process; contextual and critical policy analyses; assessing policy effects and consequences. Prerequisite: graduate standing.

**SOCIOL 7510. Social Movements and Conflicts. 3 Credits.**

Survey of approaches and research on social movements and social change. Historical and contemporary social movements in the U.S.; collective protest and violence; political revolutions. Prerequisite: graduate standing or instructor's consent.

**SOCIOL 7520. Political Sociology. 3 Credits.**

(same as Peace Studies [PEA\_ST] 7520). Social bases of power and politics, economic and political elites, the political economy of the advanced societies, sources of political conflict and change. Prerequisite: graduate standing or instructor's consent.

**SOCIOL 7530. Social Organization of the Industrial Societies. 3 Credits.**

The organizational and interorganizational structure of modern capitalist and socialist societies, including examination of alternative models such as technocracy, bureaucratic society, state capitalism, state socialism, organized capitalism. Prerequisites: Sociology [SOCIOL] 3700 or 3710 or graduate standing.

**SOCIOL 7550. Gender and Human Rights in Cross Cultural Perspective. 3 Credits.**

(same as Peace Studies [PEA\_ST] / Women and Gender Studies [WGST] 7550). Focuses on the global discourse on human rights and gender, emphasizing cross-cultural theories. Course includes the meaning of human rights, western and nonwestern perspectives, feminist contributions, important substantive debates, violations, policymaking and activism. Prerequisites: graduate standing.

**SOCIOL 7587. Seminar in Culture and Mass Media. 3 Credits.**

Sociological examination of culture and mass media, including institutional character, production and distribution, audience effects, relation of social structures. Current research, theories, methods.

**SOCIOL 7600. Contemporary Corrections. 3 Credits.**

Development of concepts of punishment, treatment. Contemporary penal and correctional institutions; problems of custody, classification, education, industry and treatment program; probation, parole. Prerequisites: Sociology [SOCIOL] 2200 and 3600 or graduate standing.

**SOCIOL 7610. Society and Social Control. 3 Credits.**

The concept of social control is analyzed from both micro and macro theoretical perspectives. Focus is on patterns of social domination. Prerequisite: Sociology [SOCIOL] 3700 or 3710 and graduate standing.

**SOCIOL 7687. Seminar in Family Sociology. 3 Credits.**

Research and theory on family structure and family life; in-depth study of a selection of topics and issues. Prerequisites: Sociology [SOCIOL] 4210 or instructor's consent.

**SOCIOL 7700. Social Organization. 3 Credits.**

Survey of approaches to the analysis of social organization emphasizing complex organizations, division of labor, social inequality, politics and the state, social change. MA core course. Prerequisite: Sociology [SOCIOL] 3700 or 3710 or graduate standing or instructor's consent.

**SOCIOL 7960. Special Readings in Sociology for the Graduate Level. 1-99 Credit.**

Extensive reading in selected area or special field. Prerequisite: graduate standing and instructor's consent. Graded on A/F basis only.

**SOCIOL 8086. Teaching Sociology. 1 Credit.**

Pedagogical and practical issues in autonomously teaching sociology in a university setting. Prerequisite: graduate standing in Sociology Department. Graded on A/F basis only.

**SOCIOL 8087. Critical Race Theory. 3 Credits.**

Critical examination of key sociological theories of race, racialization, and racism in contemporary society.

**SOCIOL 8100. Theoretical Thinking in Sociology. 3 Credits.**

Close analysis of the texts of classical and contemporary social theory. Key concepts will be elaborated in the context of intellectual history, and will be applied to deepening the theoretical significance of an empirical research question on the student's emerging agenda. Required for all entering graduate students in Sociology. Prerequisites: graduate standing or instructor's consent.

**SOCIOL 8110. Research in Sociology. 1-6 Credit.**

Research not expected to terminate in thesis or dissertation. Prerequisite: instructor's consent.

**SOCIOL 8120. The Logic of Social Research. 3 Credits.**

Meta-theoretical and conceptual issues at the core of design decision making, questionnaire construction, qualitative field techniques, interviewing, scaling, panel analysis, computer applications to qualitative data; experimental, survey and case study designs, ethics. Required for Ph.D. students.

**SOCIOL 8130. Advanced Social Statistics. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 8130). Introduction to multivariate analysis for social scientists. Emphasis on non-experimental applications of analysis of variance and correlation-regression. Computer applications emphasized. Prerequisite: Sociology [SOCIOL] 7120 or equivalent.

**SOCIOL 8140. Seminar in Population Health. 3 Credits.**

Graduate Seminar on the social distribution of morbidity and mortality. Covers major theoretical perspectives and the state of empirical evidence regarding several individuals and contextual explanations of health

disparities. Prerequisite: graduate standing and instructor permission. Graded on A/F basis only.

**SOCIOL 8150. Graduate Seminar in Urban Sociology. 3 Credits.**

In this course we will survey the field of urban sociology. Urban sociology is the study of human social relations in cities and urbanized communities. We will consider urbanization in its preindustrial, industrial, and postindustrial forms in the U.S. and elsewhere. Graduate Standing Required. Graded A-F only.

**SOCIOL 8187. Seminar on Interview Theory and Technique. 3 Credits.**

The seminar has three goals: First is the consideration of literature dealing with recent theoretical formulations of the interview. This will provide a basis, second, for critically examining a number of popular interview guidebooks. The third goal is to offer the opportunity to put theory and technique into practice by analyzing selected interview material. Prerequisite: doctoral standing.

**SOCIOL 8250. Media and Power in Comparative Perspective Seminar. 3 Credits.**

This course traces the historical development of U.S. and selected international media systems. We analyze and debate the relationship of differing media systems to political power, popular culture, and the facilitation or inhibition of democratic practices. Students do comparative analyses of international media institutions and related analyzes of media content. Prerequisites: Graduate standing or undergraduate seniors with instructor's consent.

**SOCIOL 8277. Race, Ethnicity, and Transnational Inequalities. 3 Credits.**

(same as Black Studies [BL\_STU] 8277). This graduate seminar examines the global contest of our radicalized modern world system. How do people develop and give meaning to race/ethnicity in different regions? Focus on the construction of bodies Creole identities, gender, sexualities, citizenships and immigration. Restricted to graduate students only. Graded on A/F basis only.

**SOCIOL 8287. Seminar on Sustainable Development. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 8287). An interdisciplinary examination of sustainable development focusing on social, economic, cultural and environmental dimensions of development. International and domestic issues and approaches to sustainable development are included.

**SOCIOL 8387. Seminar on Narrative and Identity. 3 Credits.**

Prerequisite: graduate standing required; instructor's consent required.

**SOCIOL 8425. Social Processes of Information/Knowledge Utilization. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 8425). Factors conditioning communication and diffusion of ideas and practices; exercise of personal influence; role of change agents and agencies in the process of change.

**SOCIOL 8435. Graduate Seminar in Medicine, Technology, and Globalization. 3 Credits.**

In the last two hundred years medicine and technology have transformed our day-to-day living as never before. They have permeated our social and personal imagination, our epistemological bearing, disciplinary practices, and not to forget national and global agendas. A key aspect of such transformations, which we are going to investigate in this course, has been the intertwining of medicine and technology in a variety of ways, resulting in wide ranging impact - from the emergence of medical gaze, transformation of healthcare practices, to present day



transnationalization and globalization of medical practices. This course would utilize recent theoretical developments to interrogate different interrelated facets of medicine, technology, and globalization. Graded on A/F basis only.

**SOCIOL 8525. Culture, Difference, and Inequality. 3 Credits.**

This course is an examination of exemplary, interdisciplinary texts employing a variety of cultural approaches to understanding difference and inequality. In this seminar, we will think about what is gained from various cultural approaches to difference and inequality, how such approaches can be achieved methodologically, and how students can apply such approaches to their own research. The main focus of the course is on cultural studies and poststructural feminist studies, but readings will also be included from intersectionality studies, affect studies, critical race studies and cultural sociology. Prerequisite: graduate standing or instructor's consent.

**SOCIOL 8687. Seminar in Criminology and Deviant Behavior. 3 Credits.**

Survey of empirical research and sociological theory in criminology and deviant behavior. May be repeated once with instructor's consent. Prerequisites: Sociology [SOCIOL] 3600 and graduate standing or instructor's consent.

**SOCIOL 8987. Seminar on the Sociology of Health and Sickness. 3 Credits.**

Topical seminar dealing with one of three subject areas: (1) Health problems, disease, illness, sickness; (2) Occupations, and Organizations in the health field, or (3) Comparative Health Care Systems. Course may be repeated for different topics. Prerequisite: graduate standing.

**SOCIOL 9090. Research. 1-99 Credit.**

Advanced work leading to thesis or dissertation. Prerequisite: consent of major advisor. Graded on a S/U basis only.

**SOCIOL 9187. Seminar in Sociological Theory I. 3 Credits.**

Traces development of sociological theory from the "generation of 1890" through the 1940s, including the work of Durkheim, Weber, Parsons and others. Prerequisite: Sociology [SOCIOL] 8100 or equivalent.

**SOCIOL 9287. Seminar in Qualitative Methods in Sociology. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 9287). Examination of various qualitative methods of research, including problem-formulation, access and interpretation of data, theory-generation, and preparation of research reports. Prerequisites: Sociology [SOCIOL] 8120 and instructor's consent.

**SOCIOL 9288. Ethnographic Fieldwork. 3 Credits.**

History of sociological ethnography, the analysis of key ethnographic texts, forms of ethnographic fieldwork, and recent debates related to representational practices. Applications to participant observation, field interviewing, and strategies of discourse analysis in various social settings. Prerequisite: Sociology [SOCIOL] 9287, graduate standing; instructor's consent.

**SOCIOL 9300. Social Interaction Research. 3 Credits.**

Seminar on research methods in social interaction. Prerequisites: Psychology [PSYCH] 8310 or instructor's consent.

**SOCIOL 9350. Graduate Seminar in Environmental Discourses. 3 Credits.**

This seminar explores human cultural interactions with nature: how we understand ourselves in relation to space, how we interact with and learn about nature, and how we use nature. Readings will include exemplary

texts from sociology, geography and anthropology, science studies and cultural studies. Graduate Standing required.

**SOCIOL 9387. Seminar in Social Gerontology. 2-3 Credit.**

Analysis of selected topics in the sociological study of age; critical issues; research literature and methodologies; development of theory. Prerequisites: Sociology [SOCIOL] 4210 or instructor's consent.

**SOCIOL 9487. Seminar in Sociological Theory II. 3 Credits.**

Theoretical developments in sociology in Europe and United States since 1950. Recent formulations, controversies. Prerequisite: Sociology [SOCIOL] 8100 or equivalent.

**SOCIOL 9500. Seminar in State and Economy. 3 Credits.**

Analysis of public policy and economic change in contemporary political-economic systems; growth of welfare state, capitalist planning, state socialist economics.

**SOCIOL 9587. Topical Seminar in Contemporary Sociological Theory. 3 Credits.**

Critical evaluation of selected points of view in current sociological theory. May be repeated with departmental consent. Prerequisite: Sociology [SOCIOL] 8100 or equivalent.

**SOCIOL 9687. Topical Seminar in Historical Sociology. 3 Credits.**

Methodological approaches to sociological explanation of historical phenomena; related sociological theories of historical development, including Weberian, Marxist and other perspectives applied to a topical historical problem. Prerequisite: Sociology [SOCIOL] 8100 or equivalent.

**SOCIOL 9777. Graduate Seminar in Body and Society. 3 Credits.**

The course is organized around three major themes - body as a site of personal and political experience; the social body, emphasizing the relationship between society, culture, and individuals; and the body as a site and instrument of politics. Readings assigned for the course are aimed at critical engagement with the "body: within and across these themes. Graded on A/F basis only.

**SOCIOL 9837. Seminar in Multivariate Analysis Techniques. 3 Credits.**

(same as Rural Sociology [RU\_SOC] 9837). Examination of various qualitative techniques of data analysis. Prerequisites: Sociology [SOCIOL] 8120 or instructor's consent.

**SOCIOL 9887. Seminar in Sociology of Gender. 3 Credits.**

Analysis of recent research in which gender is a major focus. This research is chosen to exemplify a variety of theoretical perspectives, research strategies, and substantive topics.

**SOCIOL 9920. Independent Readings in Preparation for Comprehensive Examinations. 1-6 Credit.**

Independent readings for PhD comprehensives. Open only to PhD candidates who have passed qualifying examinations. Prerequisite: consent of major advisor.

**SOCIOL 9987. Seminar in Sociological Reasoning and Research Development. 3 Credits.**

Systematic development of sociological research integrating theory, method, and contributions to knowledge. Formulations of sociological problems, conceptual frameworks, research programs analytical strategies. Prerequisites: Sociology [SOCIOL] 8120 or equivalent, doctoral standing.

## Soil Science (SOIL)

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**SOIL 2100. Introduction to Soils. 3 Credits.**

(same as Plant Science [PLNT\_S] 2100). Introduction to soil sciences with emphasis placed on physical, biological, and chemical properties and application to land use, plant growth and environmental problems. Prerequisites: 3 hours of Chemistry.

**SOIL 2106. Soil Science Laboratory. 2 Credits.**

Laboratory application of fundamental soil science concepts. Prerequisites: concurrent enrollment in Soil Science [SOIL] 2100.

**SOIL 3001. Topics in Soil Science. 1-99 Credit.**

Organized study of selected topics in soil science.

**SOIL 3085. Problems in Soil Science. 1-99 Credit.**

Special individualized research projects or readings in soil science.

**SOIL 3290. Soils and the Environment. 3 Credits.**

(same as Environmental Science [ENV\_SC] 3290). Addresses the role of soils and soil properties on environmental pollution and management. Emphasis will be placed on carbon, nitrogen, phosphorus, and sulfur transformations and transport in natural and disturbed ecosystems and soil management practices and technology to prevent or remediate environmental pollution. Prerequisites: Soil Science [SOIL] 2100, 3 hours of chemistry, English [ENGLISH] 1000 or instructor's consent.

**SOIL 4001. Topics in Soil Science. 1-99 Credit.**

Organized study of selected topics in soil science.

**SOIL 4085. Problems in Soil Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in soil science.

**SOIL 4305. Environmental Soil Physics. 3 Credits.**

(same as Environmental Science [ENV\_SC] 4305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat. Prerequisites: Soil Science [SOIL] 2100, Physics [PHYSICS] 1210 or equivalent.

**SOIL 4306. Environmental Soil Physics Laboratory. 2 Credits.**

(same as Environmental Science [ENV\_SC] 4306). Introduction to the methodology and equipment for measurement of soil physical properties and processes. Prerequisites: concurrent or previous enrollment in Soil Science [SOIL] 4305.

**SOIL 4308. Soil Conservation. 3 Credits.**

Conservation of soil with respect to topsoil, soil productivity, and fertility. Prerequisite: Soil Science [SOIL] 2100. Recommended: Agricultural Systems Management [AG S M] 4420.

**SOIL 4312. Environmental Soil Microbiology. 3 Credits.**

(same as Environmental Science [ENV\_SC] 4312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic transformation bioremediation, etc. Prerequisites: general microbiology, Soil Science [SOIL] 2100, or instructor's consent.

**SOIL 4313. Soil Fertility and Plant Nutrition. 3 Credits.**

(same as Plant Science [PLNT\_S] 4313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of

soil amendments. Prerequisites: Soil Science [SOIL] 2100 or instructor's consent.

**SOIL 4314. Soil Fertility and Plant Nutrition Laboratory. 2 Credits.**

(same as Plant Science [PLNT\_S] 4314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants. Prerequisite: concurrent or previous enrollment in Soil Science [SOIL] 4313.

**SOIL 4318. Environmental Soil Chemistry. 3 Credits.**

(same as Environmental Science [ENV\_SC] 4318 and Geology [GEOL] 4318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes. Prerequisites: Soil Science [SOIL] 2100 or GEOL 2400, Chemistry [CHEM] 1320 and 1330. Junior level standing or consent of instructor.

**SOIL 4320. Genesis of Soil Landscapes. 4 Credits.**

The co-evolution of soil landscapes. The role of water in the accumulation of parent materials and development of soil horizons. Factors and processes of soil genesis. Distribution of soil in their natural settings. Prerequisites: introductory soil science or introductory geology or permission of instructor.

**SOIL 4360. Precision Agriculture Science and Technology. 3 Credits.**

(same as Agricultural Systems Management [AG\_S\_M] 4360 and Plant Science [PLNT\_S] 4360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management. Prerequisites: Soil Science [SOIL] 2100, PLNT\_S 2110 or instructor's consent.

**SOIL 4940. Soil Science Internship. 1-12 Credit.**

Supervised professional experience with an approved public or private organization. Prerequisite: Soil and Atmospheric Sciences majors only, instructor's consent. Course may be repeated for credit. Graded on S/U basis only.

**SOIL 4950. Undergraduate Research in Soil Science. 1-4 Credit.**

Research apprenticeship with a faculty mentor. Students are expected to develop initial concept for the research, design experiments, collect data, and analyze data with faculty input, oversight, and guidance. Prerequisites: Soil [SOIL] 2100 and 2106, Statistics [STAT] 2530, and 9 hours of Soil Science with at least 3 hours above the 3000-level, and instructor's consent.

**SOIL 7001. Topics in Soil Science. 1-99 Credit.**

Organized study of selected topics in soil science. Intended for graduate students.

**SOIL 7085. Problems in Soil Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in soil science. Prerequisite: graduate standing.

**SOIL 7305. Environmental Soil Physics. 3 Credits.**

(same as Environmental Science [ENV\_SC] 7305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat. Prerequisites: graduate standing, Soil Science [SOIL] 2100, Physics [PHYSICS] 1210 or equivalent.

**SOIL 7306. Environmental Soil Physics Laboratory. 2 Credits.**

(same as Environmental Science [ENV\_SC] 7306). Introduction to the methodology and equipment for measurement of soil physical properties and properties and processes. Prerequisites: graduate standing and concurrent or previous enrollment in Soil Science [SOIL] 4305.

**SOIL 7308. Soil Conservation. 3 Credits.**

Conservation of soil with respect to topsoil, soil productivity, and fertility. Prerequisite: graduate standing and Soil Science [SOIL] 2100. Recommended: Agriculture Systems Management [AG\_S\_M] 4420.

**SOIL 7312. Environmental Soil Microbiology. 3 Credits.**

(same as Environmental Science [ENV\_SC] 7312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic transformations bioremediation, etc. Prerequisites: graduate standing and general microbiology, Soil Science [SOIL] 2100, or instructor's consent.

**SOIL 7313. Soil Fertility and Plant Nutrition. 3 Credits.**

(same as Plant Science [PLNT\_S] 7313). Explanation of principles of delivery of plant nutrients to plants, discussion of the role of each essential nutrient in crop plants and introduction to the management of soil amendments. Prerequisites: graduate standing and Soil Science [SOIL] 2100 or instructor's consent.

**SOIL 7314. Soil Fertility and Plant Nutrition Laboratory. 2 Credits.**

(same as Plant Science [PLNT\_S] 7314). The application of elementary analytical procedures to the evaluation of the nutrient status of soils and crop plants. Prerequisite: graduate standing and concurrent or previous enrollment in Soil Science [SOIL] 7313.

**SOIL 7318. Environmental Soil Chemistry. 3 Credits.**

(same as Geology [GEOL] 7318 and Environmental Science [ENV\_SC] 7318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes. Prerequisites: Soil Science [SOIL] 2100 or GEOL 2400, Chemistry [CHEM] 1320 and 1330. Junior standing or instructor's consent.

**SOIL 7320. Genesis of Soil Landscape. 4 Credits.**

The co-evolution of soil landscapes. The role of water in the accumulation of parent materials and development of soil horizons. Factors and processes of soil genesis. Distribution of soil in their natural settings. Prerequisites: graduate standing and introductory soil science or introductory geology or permission of instructor.

**SOIL 7360. Precision Agriculture Science and Technology. 3 Credits.**

(same as Agricultural Systems Management [AG\_S\_M] 7360 and Plant Science [PLNT\_S] 7360). Precision agriculture is an information-based approach to farming whereby variability is managed to optimize crop production and reduce environmental pollution. This course provides an overview of precision agriculture technologies (like GIS, GPS, remote sensing), mapping methods, and case studies illustrating decisions and management. Prerequisites: graduate standing and Soil Science [SOIL] 2100, PLNT\_S 2110 or instructor's consent.

**SOIL 8001. Topics in Soil Science. 1-99 Credit.**

Organized study of selected topics in soil science. Intended for graduate students.

**SOIL 8085. Problems in Soil Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in soil science.

**SOIL 8090. Masters Research in Soil Science. 1-10 Credit.**

Original investigations in soil science for presentation in a thesis. Graded on S/U basis only.

**SOIL 8400. Solute Transport in the Vadose Zone. 3 Credits.**

(same as Environmental Science [ENV\_SC] 8400). Transport of water and solutes in geomeia with emphasis on development of the equations of flow. Evaluation of analytical and numerical solutions to equations describing transport phenomena. Prerequisites: ENV\_SC/ Soil Science [SOIL] 7305.

**SOIL 8450. Nonthesis Research in Soil Science. 1-9 Credit.**

Research not expected to terminate in dissertation.

**SOIL 8500. Chemistry of the Vadose Zone. 3 Credits.**

(same as Environmental Science [ENV\_SC] 8500). Chemical reactions occurring in geomeia with emphasis on understanding molecular scale processes occurring at the solid-water interface, aqueous geochemistry, and soil organic matter. Prerequisites: Soil Science [SOIL] 7318 or Geology [GEOL] 7300 or instructor's consent.

**SOIL 9001. Topics in Soil Science. 1-99 Credit.**

Organized study of selected topics in soil science. Intended for graduate students.

**SOIL 9085. Problems in Soil Science. 1-99 Credit.**

Special individualized non-thesis research projects or readings in soil science.

**SOIL 9087. Seminar in Soil Science. 1 Credit.**

In-depth development of advanced aspects of soil science through reviews of results of research in progress and current scientific publications.

**SOIL 9090. Doctoral Research in Soil Science. 1-10 Credit.**

Original investigations in soil science for presentation in a dissertation. Graded on S/U basis only.

**SOIL 9407. Advanced Environmental Soil Physics. 3 Credits.**

(same as Environmental Science [ENV\_SC] 9407). Transport of mass and energy through soil with emphasis on development of the equations of flow. Evaluation of analytical and numerical solutions to differential equations describing transport phenomena. Prerequisites: Soil Science [SOIL] 7305, Mathematics [MATH] 4100/7100, or equivalent.

**SOIL 9414. Advanced Soil Fertility. 3 Credits.**

History and application of concepts of fertility and plant nutrition. Prerequisites: Soil Science [SOIL] 7313 and Plant Science [PLNT\_S] 7315 or equivalent, 14 hours of college chemistry and five hours of calculus.

**SOIL 9418. Advanced Environmental Soil Chemistry. 3 Credits.**

(same as Environmental Science [ENV\_SC] 9418). Linking molecular-scale solution-phase and surface reactions with macroscopic chemical processes. Fundamentals of aqueous surface and colloid chemistry will be discussed. Prerequisites: Soil Science [SOIL] 7318 or Geology [GEOL] 7300, and Chemistry [CHEM] 3300.

**SOIL 9422. Pedology. 3 Credits.**

Three one-hour lectures. Detailed study of processes of soil horizonization and current topics in soil genesis including quantitative assessment of spatial and temporal variability and application of GIS in landuse planning. Prerequisites: Soil Science [SOIL] 7320, one statistics course beyond ANOVA.

## South Asia Studies (S\_A\_ST)

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### **S\_A\_ST 1004. Topics in South Asian Studies. 3 Credits.**

Special topics.

### **S\_A\_ST 1100. Elementary Hindi I. 5 Credits.**

Oral-aural and structural approach. Devanagari script.

### **S\_A\_ST 1152. Asian Humanities. 3 Credits.**

(same as Religious Studies [REL\_ST] 1820, History [HIST] 1820 and Art History and Archeology [AR\_H\_A] 1230). This course is an introduction to the literature and visual arts of Asia through selected master works.

It focuses principally on India and China and investigates the distinctive features of their cultures.

### **S\_A\_ST 1200. Elementary Hindi II. 5 Credits.**

Continuation of South Asian Studies [S\_A\_ST] 1100. Spoken and written Hindi. Prerequisite: grade of C or better in S\_A\_ST 1100.

### **S\_A\_ST 1860. History of Ancient India. 3 Credits.**

(same as History [HIST] 1860). This course surveys the history of South Asian history. The course begins with the Indus Valley Civilization (fl. 2600-1900B.C.) and ends with an analysis of Islamic impact on Indic culture around 1200-1350. Emphasis will be placed on cultural and social history, religion, arts and literature, and the sources used for the study of permodern civilizations. Students will develop a basic knowledge and vocabulary necessary to pursue additional South Asian courses.

### **S\_A\_ST 1861. History of Modern India. 3 Credits.**

(same as History [HIST] 1861). This course surveys the history of the South Asian subcontinent from the early seventeenth through the twentieth century. Emphasis will be placed on cultural and social history, religion, arts and literature, imperialism and colonialism, and the sources used for the study of modern civilizations. Students will develop a basic knowledge and vocabulary necessary to pursue additional South Asian courses.

### **S\_A\_ST 1862. History of India: 1000-1750. 3 Credits.**

(Same as History [HIST] 1862) This course surveys the history of the South Asian subcontinent from the eleventh through mid-eighteenth centuries. Emphasis will be placed on cultural and social history, religion, arts and literature, and the sources used to study civilization. Students will develop a basic knowledge and vocabulary necessary to pursue additional South Asian courses.

### **S\_A\_ST 2005. Topics in South Asian Studies-Humanities. 3 Credits.**

Special Topics. May be repeated for credit.

### **S\_A\_ST 2100. Philosophy: East and West. 3 Credits.**

(same as Philosophy [PHIL] 2100). Compares the interpretation and role of philosophical concepts such as experience, reason permanence, change, immortality, soul, God, etc., in Indian, Chinese and European traditions. Prerequisite: sophomore standing.

### **S\_A\_ST 2110. Elementary Hindi III. 3 Credits.**

Continuation of South Asian Studies [S\_A\_ST] 1200. Prerequisite: S\_A\_ST 1100, 1200 or equivalent.

### **S\_A\_ST 2270. Geography of Asia. 3 Credits.**

(same as Geography [GEOG] 2270). An introductory survey of the geography of Asia from India through Southeast Asia to China and Japan, emphasizing factors contributing to cultural similarities and variations, conflicts of interest, and current development. Prerequisites: sophomore standing or one Introductory Geography course.

### **S\_A\_ST 2800. Women in Indian History. 3 Credits.**

(same as History [HIST] 2800). This course examines the role of women in Indian (South Asian) history, focusing on women in British India from the eighteenth century up to the Partition of 1947. While previous knowledge of South Asian history may be beneficial, it is not required for this course.

### **S\_A\_ST 3130. Advanced Hindi Readings I. 4 Credits.**

Directed readings in the literature of the student's area of concentration, and advanced conversation. Prerequisite: instructor's consent.

### **S\_A\_ST 3160. Advanced Hindi Readings II in South Asian Studies. 4 Credits.**

Continuation of South Asian Studies [S\_A\_ST] 3160. Prerequisite: instructor's consent.

### **S\_A\_ST 3200. Hinduism. 3 Credits.**

(same as Religious Studies [REL\_ST] 3200). Origin and development of central themes of traditional Hinduism from earliest times to the modern period. Topics include: the Vedic tradition, rituals and practice, varieties of yoga and meditation, Indian religious thought and devotional Hinduism.

### **S\_A\_ST 3230. Buddhism and Environmental Ethics. 3 Credits.**

(same as Religious Studies [REL\_ST] 3230). Global environmental crisis is associated with rapidly expanding human population. Buddhist teachings about the interdependent aspects of existence and interrelatedness of all life may provide critical insights for how humanity can achieve balance and reciprocity with nature.

### **S\_A\_ST 3240. Buddhism of South and Southeast Asia. 3 Credits.**

(same as Religious Studies [REL\_ST] 3240). Examines the origins of Buddhism in India, the narratives of the life of the Buddha, the development of early Buddhist schools, the extension of Buddhism into Central and Southeast Asia, and the current practice of Buddhism in south and Southeast Asia.

### **S\_A\_ST 3245. Nonviolence in the Modern World. 3 Credits.**

(same as History [HIST] 3840 and Peace Studies [PEA\_ST] 3840). Readings on recent world history, emphasis on Gandhi and nonviolent tradition in America, Europe and the Third World.

### **S\_A\_ST 3260. Southeast Asia. 3 Credits.**

(same as Geography [GEOG] 3260). Physical, cultural, historical and regional geography of Southeast Asia, with an introduction to East Asian geography. Emphasizes the problems of tradition and development. Prerequisite: GEOG 2270 or junior standing.

### **S\_A\_ST 3280. Geography of South Asia. 3 Credits.**

(same as Geography [GEOG] 3280). Topical and regional analysis of India, Pakistan, Sri Lanka. Historical development of distinctive cultural regions. Relations with neighboring areas. Impact of Westernization on economic activities, settlements, population. Prerequisite: junior standing.

### **S\_A\_ST 4004. Topics in South Asian Studies. 3 Credits.**

Special topics.

### **S\_A\_ST 4300. Religious Narratives of South Asia. 3 Credits.**

(same as Religious Studies [REL\_ST] 4300). Study of major narratives of India and their interpretation in literature and art. Topics include: Vedic and Epic mythology, stories of Krishna, myths and images of Shiva, and forms of the Goddess.

### **S\_A\_ST 4620. Politics in India and South Asia. 3 Credits.**

(same as Political Science [POL\_SC] 4620). Contemporary political and governmental patterns of India, Pakistan, Sri Lanka, Nepal, and Bangladesh.

**S\_A\_ST 4630. Sanskrit I. 3 Credits.**

(same as Religious Studies [REL\_ST] 4630). This course is intended as a "sampler" of Sanskrit literature. We will read Sanskrit texts in the original. The objectives of the course are 1) Expanding the students' knowledge of the Sanskrit language, 2) To acquaint the students with a broad range of textual genres in Sanskrit literature, and 3) To acquaint the students with some central ideas of Hindu and Buddhist philosophy.

**S\_A\_ST 4640. Sanskrit II. 3 Credits.**

(same as Religious Studies [REL\_ST] 4640). This course is intended as a "sampler" of Sanskrit literature. We will read Sanskrit texts in the original. The objectives of the course are 1) Expanding the students' knowledge of the Sanskrit language, 2) To acquaint the students with a broad range of textual genres in Sanskrit literature, and 3) To acquaint the students with some central ideas of Hindu and Buddhist philosophy.

**S\_A\_ST 4790. Culture and Society in South Asia. 3 Credits.**

(same as Anthropology [ANTHRO] 4790). Survey of the cultures, social organizations, and lived experience of people from across the Indian subcontinent. Major topics include caste, kinship, gender, religion, village life, urbanization, public culture, popular culture, social change, and the South Asian diaspora. Prerequisite: junior standing.

**S\_A\_ST 4800. Asian Philosophy. 3 Credits.**

(same as Philosophy [PHIL] 4800). This course traces the origins of Indian and Chinese philosophical world views. Included are the major ideas in Hindu, Jaina, and Buddhist thought in India, and Taoism and Confucianism in China. Emphasis is placed on the diverse, assimilative, and pragmatic nature of Indian thought and its impact on contemporary Asian philosophy. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**S\_A\_ST 4810. Philosophy of India. 3 Credits.**

(same as Philosophy [PHIL] 4810). General development of Indian Philosophy. Prerequisite: sophomore standing and one course in Philosophy; or instructor's consent.

**S\_A\_ST 4820. Contemporary Indian Philosophy. 3 Credits.**

(same as Philosophy [PHIL] 4820). Indian philosophical traditions as represented in backgrounds of Gandhi, Tagore, Tagore, Tagore, and philosophical systems of Radhakrishnan, Aurobindo, etc. Prerequisite: junior standing.

**S\_A\_ST 4850. Traversing the Muslim World. 3 Credits.**

(same as History [HIST] 4850) The traveler's tale formed an important part of the medieval world's system of knowledge. The writing intensive discussion-based course examines a wide array of the most influential travelers in Muslim lands such as Ibn Fadlan, Ibn Buttuta, Benjamin of Tudela and Marco Polo.

**S\_A\_ST 4860. Indian Army as Colonial Army. 3 Credits.**

(same as History [HIST] 4860). This writing intensive discussion-based course examines how the Indian Army acted as a colonial army in the British Empire, including Africa, the Boxer Rebellion, and the World Wars. Focus is on the role of the Indian Army, impact of the Sepoy Mutiny on a martial race ideology.

**S\_A\_ST 7004. Topics in South Asian Studies. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: instructor's consent.

**S\_A\_ST 7200. Religious Texts and Interpretation: The Veda. 3 Credits.**

(same as Religious Studies [REL\_ST] 8200). This course examines the Veda, the foundational scripture of Hinduism. It includes close study of

Vedic texts and rituals and the influence, interpretation, and application of the Veda in the later Hinduism.

**S\_A\_ST 7350. Special Readings in South Asian Studies Languages. 1-6 Credit.**

Individual advanced study of desired South Asian language. Prerequisite: instructor's consent.

**S\_A\_ST 7630. Sanskrit I. 3 Credits.**

(same as Religious Studies [REL\_ST] 7630). This course is intended as a "sampler" of Sanskrit literature. We will read Sanskrit texts in the original. The objectives of the course are 1) Expanding the students' knowledge of the Sanskrit language, 2) To acquaint the students with a broad range of textual genres in Sanskrit literature, and 3) To acquaint the students with some central ideas of Hindu and Buddhist philosophy. Prerequisite: graduate standing.

**S\_A\_ST 7640. Sanskrit II. 3 Credits.**

(same as Religious Studies [REL\_ST] 7640). This course is intended as a "sampler" of Sanskrit literature. We will read Sanskrit texts in the original. The objectives of the course are 1) Expanding the students' knowledge of the Sanskrit language, 2) To acquaint the students with a broad range of textual genres in Sanskrit literature, and 3) To acquaint the students with some central ideas of Hindu and Buddhist philosophy. Prerequisite: graduate standing.

**S\_A\_ST 7700. Religious Narratives of South Asia. 3 Credits.**

(same as Religious Studies [REL\_ST] 7700). Study of major narratives of India and their interpretation in literature and art. Topics include: Vedic and Epic mythology, stories of Krishna, myths and images of Shiva, and forms of the Goddess.

**S\_A\_ST 7790. Cultures and Society in South Asia. 3 Credits.**

(same as Anthropology [ANTHRO] 7790). Survey of the cultures, social organizations, and lived experience of people from across the Indian subcontinent. Major topics include cast, kinship, gender, religion, village life, urbanization, public culture, popular culture, social change, and the South Asian diaspora. Prerequisite: graduate standing.

**S\_A\_ST 8085. Problems in South Asian Studies. 3 Credits.**

(same as History [HIST] 8085). Prerequisite: instructor's consent.

**S\_A\_ST 9040. Indian Philosophy. 3 Credits.**

Reality, levels of being, status of the world, nature of knowledge in Indian philosophy in relation the Advaita Vedanta system of Samkara.

## Spanish (SPAN)

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**SPAN 1100. Elementary Spanish I. 5 Credits.**

An introductory course for students who wish to begin their study of Spanish. It teaches the four skills - listening, speaking, reading, and writing. The class meets four days a week and one day in the lab. Classtime is used to practice the structures and vocabulary.

**SPAN 1100H. Elementary Spanish I - Honors. 5 Credits.**

This designated honors section of Elementary Spanish 1100 will challenge students to explore more deeply the currently existing thematic units of the Spanish 1100 curriculum. Students will participate in group discussions, creative projects, independent study and use of authentic written and aural material from primary sources. Honors Spanish 1100 will integrate cultural events outside the classroom such as movies, guest lectures, art exhibits, seminars or concerts as available. Once a semester, Honors Spanish 1100 will meet with Honors Spanish

1200 and 2100 as a cohort group for further intellectual exchange and enrichment. Honors eligibility required. Graded on A/F basis only.

**SPAN 1200. Elementary Spanish II. 5 Credits.**

The second course of the beginning sequence in the continuation of Spanish [SPAN] 1100. It places equal emphasis on the four skills; listening, speaking, reading, and writing. Students who have prior knowledge of Spanish are encouraged to take this course. Prerequisite: Grade of C or better in SPAN 1100 or equivalent. NO credit for both SPAN 1200 and 1250.

**SPAN 1200H. Elementary Spanish II - Honors. 5 Credits.**

This course, designed for students who have taken Spanish 1100 or an equivalent course and enrolled in the Honors College, offers an introduction to the Spanish language and the many cultures it encompasses. Your course work will allow you to develop all four language skills: reading, speaking, listening and writing along with the cultural background necessary to help you to communicate effectively in Spanish. With the honors designation section, the course will allow students to access greater challenges in the existing thematic units in the curriculum through group discussion, creative projects and authentic situations. Prerequisites: grade of C or better in SPAN 1100; Honors eligibility required. Graded on A/F basis only.

**SPAN 1250. Accelerated Beginning Spanish. 5 Credits.**

Course is designed for students who have taken more than two years of High School Spanish. It offers a reinforcement of the beginning concepts of the Spanish language and the many cultures it encompasses. Course allows students to further develop all language skills. NO credit for both Spanish [SPAN] 1200 and 1250.

**SPAN 2001. Undergraduate Topics in Spanish-General. 1-3 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester. May be repeated with consent of department. Prerequisite: Spanish [SPAN] 1200 with a grade of C or better.

**SPAN 2005. Undergraduate Topics in Spanish-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects may vary from semester to semester. May be repeated with consent of department. Prerequisite: Spanish [SPAN] 1200 with a grade of C or better.

**SPAN 2100. Elementary Spanish III. 3 Credits.**

A multi-skill course following Spanish [SPAN] 1200, centering on cultural/literary readings, and including a grammar review, practice in the spoken language, as well as some practice in written expression. Prerequisite: grade of C or better in SPAN 1200 or 1250, or their equivalent courses.

**SPAN 2100H. Elementary Spanish III - Honors. 3 Credits.**

A multi-skill course following Spanish [SPAN] 1200, centering on cultural/literary readings, and including a grammar review, practice in the spoken language, as well as some practice in written expression. The course seeks to improve student's fluency in Spanish and to expose them to the many cultures it encompasses. This course will integrate cultural events outside the classroom as well such as movies, guest lectures, art exhibits, seminars or concerts as available. Prerequisite: grade of C or better in SPAN 1200 or 1250, or their equivalent courses. Honors eligibility required. Graded on A/F basis only.

**SPAN 2160. Intermediate Spanish Composition and Conversation. 3 Credits.**

First course following required elementary sequence. Designed specifically to correct any remaining weaknesses in gross writing skills and to develop further conversational ability with equal emphasis on

both of these aspects. Classwork involves written compositions and oral presentations. Prerequisites: Spanish [SPAN] 2100 or equivalent.

**SPAN 2160H. Intermediate Spanish Composition and Conversation - Honors. 3 Credits.**

First course following required elementary sequence. Designed specifically to correct any remaining weaknesses in gross writing skills and to develop further conversational ability with equal emphasis on both of these aspects. Classwork involves written compositions and oral presentations. Prerequisites: SPAN 2100 or equivalent. Honors eligibility required.

**SPAN 2310. Spanish Civilization. 3 Credits.**

Survey of Spanish history, arts and culture. Open to any student interested. No knowledge of Spanish required. May not be included in area of concentration in Spanish.

**SPAN 2320. Spanish Literature in Translation. 3 Credits.**

(same as Peace Studies [PEA\_ST] 2320). May not be included in area of concentration in Spanish. Subject, such as the literature of the Spanish Civil War, varies with instructor. Prerequisite: sophomore standing.

**SPAN 2330. Latin American Civilization. 3 Credits.**

Survey of Latin American history, arts and culture. Open to any student interested. No knowledge of Spanish required. May not be included in area of concentration in Spanish.

**SPAN 2340. Hispanic Minority Literature. 3 Credits.**

This course studies the literature of Hispanic minorities in the United States: Chicanos (Mexican American), Mainland Puerto Ricans, and Cuban exile writers. It explores the question of minority versus majority literatures and the creation of a Hispanic minority discourse. No knowledge of Spanish required. Prerequisite: English [ENGLSH] 1000.

**SPAN 3001. Topics in Spanish-General. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing. Departmental consent for repetition.

**SPAN 3004. Topics in Spanish-Social Science. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing. Departmental consent for repetition.

**SPAN 3005. Topics in Spanish-Humanities/Fine Arts. 1-3 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: sophomore standing. Departmental consent for repetition.

**SPAN 3150. Advanced Spanish Conversation. 3 Credits.**

Course puts into practice the linguistic skills learned at intermediate levels. It develops and increases the capacity for comprehension and oral expression in the language. Focus is on practice of certain syntactic structures and idiomatic expressions, and on acquisition of new vocabulary. Prerequisite: Spanish [SPAN] 2160 or equivalent.

**SPAN 3160. Advanced Spanish Composition. 3 Credits.**

Course emphasizes writing at an advanced level, with a certain degree of sophistication about varied subjects and using different techniques of composition. Classwork consists mainly of the discussion of both the ideas and techniques used in different textual forms. Prerequisite: Spanish [SPAN] 2160 or equivalent.

**SPAN 3170. Conversational Spanish Practice. 3 Credits.**

Study Abroad Conversational Spanish course for students who have already completed 3150, but want more practice. Does not count for

majors/minors. Prerequisite: Spanish [SPAN] 3150 and instructor's consent. Graded on A/F basis only.

**SPAN 3280. Commercial Spanish. 3 Credits.**

Business terminology and forms. Translate and compose business letters and documents for advertising and promotion, trade and commerce, imports and exports, money and banking. Prerequisite: Spanish [SPAN] 2160 or equivalent.

**SPAN 3400. Mexican Culture and Civilization. 2-3 Credit.**

Study of Mexican culture and civilization through field trips, excursions and selected readings in Mexican history and literature. No knowledge of Spanish required. Open only to participants in UMC's study programs in Mexico. Prerequisites: sophomore standing or instructor's consent.

**SPAN 3420. Introduction to Hispanic Literature I. 3 Credits.**

Selected prose fiction and nonfiction prose of Spain and Spanish America. Prerequisite: Spanish [SPAN] 3160 or equivalent.

**SPAN 3430. Introduction to Hispanic Literature II. 3 Credits.**

Selected plays and poetry of Spain and Spanish America. Prerequisite: Spanish [SPAN] 3160 or equivalent.

**SPAN 3710. Survey of Minority & Creole Languages of the U.S. & the Caribbean. 3 Credits.**

(same as French [FRENCH] 3710 and Linguistics [LINGST] 3710). Analysis of the state of the minority languages of the U.S. and the Creole languages of the Caribbean with particular attention to the social status of these languages and speakers' attitudes toward them in the context of ethnic, culture and national identity (taught in Eng.). Prerequisite: sophomore standing.

**SPAN 3721. Spanish Phonetics. 3 Credits.**

(same as Linguistics [LINGST] 3721). Introductory course to the study of Spanish phonological, phonetic and spelling systems, practice of pronunciation, phonetic transcriptions, and introduction to the variation of Spanish pronunciation in the Hispanic world. The course is conducted in Spanish. Prerequisite: Spanish [SPAN] 2160 or equivalent.

**SPAN 4070. Intensive Beginning Spanish. 3 Credits.**

Designed for rapid acquisition of a reading knowledge of Spanish. Cannot be taken to fulfill undergraduate language requirement. Prerequisite: instructor's consent.

**SPAN 4120. Foreign Language Teaching Methodology. 3 Credits.**

(same as French [FRENCH] 4120). Theory and techniques of current foreign language methodology and their application in the classroom. Presentation of instructional projects, classroom observations, and strategies for classroom management. Prerequisite: department consent. May not be used towards Arts & Science major.

**SPAN 4130. Stylistics. 3 Credits.**

Advanced composition class. Discussion of complex grammatical structures necessary for formal writing. Examination of stylistic devices and structures beyond sentence level, in order to learn to organize discourse level production. Prerequisite: Spanish [SPAN] 2160 or equivalent. Recommended: SPAN 3420 and 3430.

**SPAN 4410. Spanish Medieval Literature. 3 Credits.**

The principal periods, schools, and genres of Spanish medieval literature are surveyed through representative masterworks. Lectures and periodic student reports help relate works read to the rest of contemporary Spanish and European literature. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4420. Golden Age Poetry. 3 Credits.**

Poetry of the principal Spanish poets of the 16th and 17th centuries and of literary criticism devoted to it. Special emphasis is placed on the works of Garcilaso de la Vega, Fray Luis de Leon, among others. Short papers and explications are generally required. Prerequisite: Spanish [SPAN] 3420 and 3430.

**SPAN 4421. Renaissance and Golden Age Prose. 3 Credits.**

Representative prose works from various genres are read as well as literary criticism devoted to them. Among the authors studied are Fernando de Rojas, Jorje Montemayor, Miguel de Cervantes, Francisco de Quevedo, and Maria de Zayas. Prerequisite: Spanish [SPAN] 3420 and 3430.

**SPAN 4422. Spanish Theatre in the Golden Age. 3 Credits.**

Dramatists to be studied include Lope de Vega, Calderon, Ruiz de Alarcon, Tirso de Molina, Guillen de Castro, Velez de Guevara, and some of Cervantes' theatre. Prerequisite: Spanish [SPAN] 3420 and 3430.

**SPAN 4423. Don Quijote. 3 Credits.**

In this course students read the two parts of Don Quijote in the original Spanish. Analysis and class discussion highlight elements of literary interest. Neo-positivist methodology, factual background, formalist considerations and psychoanalytic approaches are used in this course. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4441. Twentieth-Century Spanish Novel. 3 Credits.**

Reading and critical analysis of representative novels written in Spain from early century to the post-Franco period. The objectives of the course are to develop critical skills in dealing with these fictional works and to understand the major trends of the contemporary Spanish novel. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4442. Advanced Contemporary Culture of Spain. 3 Credits.**

Study of Spanish culture and civilization through field trips, excursions, and selected readings in history, literature, and contemporary print media. Prerequisite: Spanish [SPAN] 3150, 3160, 3721 or equivalent. Open only to participants in the UMC's summer study in Spain.

**SPAN 4450. Hispanic Literature of Resistance. 3 Credits.**

A study of the literature of commitment in the Hispanic world: literature in its historical and political contexts that makes a conscious effort to change social conditions. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4460. Advanced Contemporary Culture of Spanish America. 3 Credits.**

A study of Spanish-American culture and civilization through selected readings in history and literature, and the use of visual media. Graded on A/F basis only. Prerequisites: Spanish [SPAN] 3150 and 3160.

**SPAN 4461. Advanced Spanish Civilization. 3 Credits.**

A survey of Spanish culture and Spanish history from the Middle Ages to the present with special emphasis on contemporary culture. Students will be provided with knowledge of chronology, geography and contemporary issues from readings of journals, novels and Internet news. Prerequisites: Spanish [SPAN] 3150 and 3160.

**SPAN 4470. Survey of Spanish American Literature I. 3 Credits.**

This is an introductory course in Spanish American literature. The reading material in prose and verse is studied in chronological order from the early 16th to the early 20th century. Readings include selections from 22 major Spanish American authors. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4471. Survey of Spanish American Literature II. 3 Credits.**

Survey of contemporary Latin American literature from approximately 1910 to the present. Close analysis and reading of representative major texts of Latin American literature. Students read complete selections and short excerpts from a standard anthology, and three complete novels. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4480. Mexican Literature. 3 Credits.**

Analysis of selected poetry, prose, and drama of contemporary Mexico. Course examines the writings of major and minor figures from several critical perspectives. Works by Agustin, Aviles, Fabila, Carballido, Castellanos, Fuentes, Paz, and others are read. Prerequisites: SPAN 3420 and 3430.

**SPAN 4490. Hispanic Oral Traditions. 3 Credits.**

This course proposes to examine the Hispanic Oral Tradition through a study of romances and related genres, the corrido, decima and folktale. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4520. Modernista and Contemporary Poetry. 3 Credits.**

Careful study and analysis of selected poems by major figures in Hispanic poetry. The period covered includes the modernist movement to the present. Particular attention is given to the following figures: Ruben Dario, Octavio Paz, Pablo Neruda, and Nicolas Guillen. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4530. The Spanish American Theatre. 3 Credits.**

Intended as an overview of a vital genre in contemporary Spanish American studies, this survey introduces dramatists whose works are the focus of increasing attention from international specialists. The works of Emilio Carballido, Egon Wolff, Griselda Gambaro and Osvald Dragun, among others are discussed. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4540. Afro-Hispanic Literature. 3 Credits.**

A study of prose, poetry, and drama, in Spanish, written by authors of African descent in the Americas. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4550. Nobel Laureates in Spanish American Literature. 3 Credits.**

Analyzes the creative expression of five Nobel laureates from Spanish America. Selected works of Gabriela Mistral, Pablo Neruda, Miguel Angel Asturias, Octavio Paz and Gabriel Garcia Marquez are read in relation to contemporary theory. Prerequisites: Spanish [SPAN] 3420 and 3430.

**SPAN 4711. History of the Spanish Language. 3 Credits.**

(same as Linguistics [LINGST] 4711). Diachronic analysis of phonological, morphological, and syntactical systems of Spanish, from Vulgar Latin to contemporary dialects. Prerequisite: Completed with passing grade any Linguistics course 3000 or above or by consent of instructor. Recommended: Spanish [SPAN] 3420 and 3430.

**SPAN 4721. Structure of Modern Spanish. 3 Credits.**

(same as Linguistics [LINGST] 4721). Synchronic analysis of phonology, morphology and syntax of spoken Spanish dialects. Prerequisites: four 3000-level courses in Spanish.

**SPAN 4722. Spanish Across the Continents. 3 Credits.**

(same as Linguistics [LINGST] 4722). This course focuses on the effects of migratory movements on language change, considering the Spanish spoken in Latin America, Puerto Rico, Spain and the USA. The class sharpens awareness and recognition of the linguistic diversity of the Spanish-speaking regions of the world. Graded on A/F basis only. Prerequisites: four 3000-level courses in Spanish.

**SPAN 4723. Language and Society: Spanish in the U.S.. 3 Credits.**

(same as Linguistics [LINGST] 4723). This class surveys linguistic and social issues pertaining to Spanish in the U.S. (past, present and future). Topics include bilingualism, code switching (a.k.a. Spanglish), first language attrition, linguistic identity, and the role of Spanish in education, services and media. Graded on A/F basis only. Prerequisites: four 3000-level courses in Spanish.

**SPAN 4940. Service Learning in Spanish. 1 Credit.**

(same as Romance Languages [RM\_LAN] 4940). Course offers our majors and advanced minors the opportunity to use their language skills in real-life community settings. Graded on S/U basis only. Does not meet A&S general education requirements. May be repeated once for credit. Prerequisites: junior or senior standing and departmental consent.

**SPAN 4960. Special Readings in Spanish. 1-3 Credit.**

Independent study through readings, conferences, reports. Prerequisites: Spanish [SPAN] 3420 and 3430 and departmental consent.

**SPAN 4980. Special Themes in Spanish. 3 Credits.**

Subject varies according to instructor. Prerequisites: Spanish [SPAN] 3420 and 3430. May be repeated for credit.

**SPAN 4993. The Capstone Experience in Spanish. 3 Credits.**

This course is required of all majors. Topics vary but all courses synthesize and review essential components of the major: speaking, writing, reading in Spanish, and the ability to think critically and analytically.

**SPAN 7004. Topics in Spanish-Social Science. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Prerequisite: graduate standing, departmental consent for repetition.

**SPAN 7120. Foreign Language Teaching Methodology. 3 Credits.**

(same as French [FRENCH] 7120). Theory and techniques of current foreign language methodology and their application in the classroom. Presentation of instructional projects, classroom observations, and strategies for classroom management. Prerequisite: graduate standing or departmental consent. May not be used towards Arts & Science major.

**SPAN 7130. Stylistics. 3 Credits.**

Prerequisite: Spanish [SPAN] 3160. Recommended: SPAN 3420 and 3430.

**SPAN 7410. Spanish Medieval Literature. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7420. Golden Age Poetry. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7421. Renaissance and Golden Age Prose. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7422. Spanish Theatre in the Golden Age. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7423. Don Quijote. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7441. Twentieth-Century Spanish Novel. 3 Credits.**

Prerequisites: graduate standing Spanish [SPAN] 3420 and 3430.

**SPAN 7442. Advanced Contemporary Culture of Spain. 3 Credits.**

Study of Spanish culture and civilization through field trips, excursions, and selected readings in history, literature, and contemporary print media. Prerequisite: graduate standing and Spanish [SPAN] 3150, 3160, 3721



or equivalent. Open only to participants in the UMC's summer study in Spain.

**SPAN 7450. Hispanic Literature of Resistance. 3 Credits.**

A study of the literature of commitment in the Hispanic world: literature in its historical and political contexts that makes a conscious effort to change social conditions. Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7460. Advanced Contemporary Culture of Spanish America. 3 Credits.**

A study of Spanish-American culture and civilization through selected readings in history and literature, and the use of visual media. Graded on A/F basis only. Prerequisites: Spanish [SPAN] 3150 and 3160.

**SPAN 7461. Advanced Spanish Civilization. 3 Credits.**

A survey of Spanish culture and Spanish history from the Middle Ages to the present with special emphasis on contemporary culture. Students will be provided with knowledge of chronology, geography and contemporary issues from readings of journals, novels and Internet news. Prerequisites: graduate standing and Spanish [SPAN] 3150 and 3160.

**SPAN 7470. Survey of Spanish American Literature I. 3 Credits.**

From beginning to 1880. Prerequisites: graduate standing Spanish [SPAN] 3420 and 3430.

**SPAN 7471. Survey of Spanish American Literature II. 3 Credits.**

From 1880 to present. Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7480. Mexican Literature. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7490. Hispanic Oral Traditions. 3 Credits.**

This course proposes to examine the Hispanic Oral Tradition through a study of romances and related genres, the corrido, decima and folktale. Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7520. Modernista and Contemporary Poetry. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7530. The Spanish American Theatre. 3 Credits.**

Prerequisites: graduate standing and Spanish [SPAN] 3420 and 3430.

**SPAN 7540. Afro-Hispanic Literature. 3 Credits.**

A study of prose, poetry, and drama, in Spanish, written by authors of African descent in the Americas. Prerequisites: graduate standing Spanish [SPAN] 3420 and 3430.

**SPAN 7550. Nobel Laureates in Spanish American Literature. 3 Credits.**

Analyzes the creative expression of five Nobel laureates from Spanish America. Selected works of Gabriela Mistral, Pablo Neruda, Miguel Angel Asturias, Octavio Paz and Gabriel Garcia Marquez are read in relation to contemporary theory. Prerequisites: graduate standing.

**SPAN 7711. History of the Spanish Language. 3 Credits.**

(same as Linguistics [LINGST] 7711). Diachronic analysis of phonology, morphology, and syntax from Vulgar Latin to modern period. Prerequisite: completed with passing grade any Linguistic course 3000 or above or by instructor's consent.

**SPAN 7721. Structure of Modern Spanish. 3 Credits.**

(same as Linguistics [LINGST] 7721). Synchronic analysis of phonology, morphology and syntax of spoken Spanish dialects. Prerequisites: graduate standing; four 3000-level courses in Spanish.

**SPAN 7722. Spanish Across the Continents. 3 Credits.**

(same as Linguistics [LINGST] 4722). This course focuses on the effects of migratory movements on language change, considering the Spanish spoken in Latin America, Puerto Rico, Spain and the USA. The class sharpens awareness and recognition of the linguistic diversity of the Spanish-speaking regions of the world. Prerequisite: four 3000-level courses in Spanish. Graded A-F only. Graduate Standing Required.

**SPAN 7723. Language and Society: Spanish in the US. 3 Credits.**

This class surveys linguistic and social issues pertaining to Spanish in the US (past, present and future). Topics include bilingualism, code switching (a.k.a. Spanglish), first language attrition, linguistic identity, and the role of Spanish in education, services and media. Prerequisites: four 3000-level courses in Spanish. Graded A-F only. Graduate standing required.

**SPAN 7960. Special Readings in Spanish. 1-3 Credit.**

Independent study through readings, conferences, reports. Prerequisites: departmental consent.

**SPAN 7980. Special Themes in Spanish. 3 Credits.**

Subject varies according to instructor.

**SPAN 7993. The Capstone Experience in Spanish. 3 Credits.**

Topics vary but all courses synthesize and review essential components of the major: speaking, writing, reading in Spanish, and the ability to think critically and analytically.

**SPAN 8080. Readings in Spanish. 1-99 Credit.**

Independent readings in preparation for MA or MALT comprehensive examination in Spanish. Graded on A/F basis only.

**SPAN 8085. Problems in Spanish. 1-99 Credit.**

Prerequisite: graduate standing.

**SPAN 8087. Seminar in Spanish. 2-3 Credit.**

Subject varies according to instructor. Prerequisite: graduate standing.

**SPAN 8090. Research in Spanish. 1-99 Credit.**

Leads to preparation of MA or MALT thesis. Graded on S/U basis only.

**SPAN 8120. Bilingualism and Language Contact. 3 Credits.**

(same as French [FRENCH] 8120 and Linguistics [LINGST] 8120). Global analysis of the study of Bilingualism from a combined sociocultural, sociolinguistic and psycholinguistic perspective based on current research and examination of various phenomena of language contact (taught in Eng.). Prerequisite: graduate standing.

**SPAN 8412. Studies in Spanish Literature of the Medieval Period. 3 Credits.**

Prerequisite: graduate standing. Recommended Spanish [SPAN] 8460.

**SPAN 8415. Studies in Spanish Literature of the Renaissance. 3 Credits.**

Prerequisite: graduate standing.

**SPAN 8416. Studies in Spanish Literature in the Golden Age. 3 Credits.**

Prerequisite: graduate standing.

**SPAN 8419. Studies in Nineteenth-Century Spanish Literature. 3 Credits.**

Prerequisite: graduate standing.

**SPAN 8420. Studies in Twentieth-Century Spanish Literature. 3 Credits.**

Prerequisite: graduate standing.

**SPAN 8427. Studies in Colonial Spanish American Literature. 3 Credits.**

Analysis of seminal literary and "Historical" texts interpreting the Encounter, Conquest and Colonization of Spanish America.

**SPAN 8431. Studies in Spanish-American Fiction. 3 Credits.**

Prerequisite: graduate standing.

**SPAN 8433. Studies in Latin American Literature. 3 Credits.**

Prerequisite: graduate standing.

**SPAN 8460. Old Spanish--Phonology, Morphology and Syntax. 3 Credits.**

Prerequisite: knowledge of Latin, to be demonstrated by passing departmental written examination or by completing Latin [LATIN] 7110 with grade of B or better.

**SPAN 9080. Readings in Spanish. 3-6 Credit.**

Independent readings in preparation for Ph.D. comprehensive examination in Spanish.

**SPAN 9090. Research in Spanish. 1-99 Credit.**

Leads to preparation of PhD dissertation in Spanish. Graded on S/U basis only.

## **Special Education (SPC\_ED)**

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**SPC\_ED 3300. Special Readings in Special Education. 1-3 Credit.**

Directed study of literature and research reports in special education.

**SPC\_ED 3310. Aiding: Special Education. 1-3 Credit.**

Supervised observational and instructionally-related activities in special education.

**SPC\_ED 3500. Student Teaching in Special Education. 1-99 Credit.**

Ten-week, full-time placement in Special Education classroom; field-based opportunity for the application of competencies developed in initial certification area(s). Prerequisite: advisor's consent.

**SPC\_ED 4020. Inquiry into Learning II. 3 Credits.**

Inquiring into Learning II addresses topics in the foundations of pedagogy including classroom management, behavior management, and students with special needs. Prerequisite: Progression into Phase II. Graded on A/F basis only.

**SPC\_ED 4300. Introduction to Special Education. 3 Credits.**

Introductory overview of the field of special education; historical developments, characteristics of special populations, and compliance with state and federal regulations.

**SPC\_ED 4305. Introduction to Special Education for Regular Educators. 3 Credits.**

Introduction to the field of special education for other majors; survey of exceptionalities with emphasis on the mainstreaming exceptional students.

**SPC\_ED 4310. Behavioral Management for Exceptional Students. 3 Credits.**

Study of classroom management and applied behavior analysis strategies. Focus on teacher as decision-maker in the design, implementation, evaluation of individual and group management programs. Prerequisite: Special Education [SPC\_ED] 4300.

**SPC\_ED 4320. Assessment and Evaluation in Special Education. 3 Credits.**

Procedures and instruments used in the assessment of individual with disabilities, including standardized and non-standardized measures of intellectual ability, academic achievement, oral language, social/emotional behaviors, career/vocational needs. Prerequisite: Special Education [SPC\_ED] 4300.

**SPC\_ED 4325. Language Development of Exceptional Students. 3 Credits.**

Study of language and communication issues and disorders in special education; normal and atypical language development; language assessment and intervention models and programs. Prerequisite: Special Education [SPC\_ED] 4300.

**SPC\_ED 4330. Collaboration and Consultation in Special Education. 3 Credits.**

Study of communication, problem-solving, collaboration strategies. Application of strategies to work with exceptional students, their families, other professional members of interdisciplinary, interagency teams. Prerequisites: Special Education [SPC\_ED] 4300.

**SPC\_ED 4370. Literacy in Special Education. 3 Credits.**

Addresses specific literacy needs of special needs students with a focus on assessment and instruction for special needs students in regular classrooms. Pre/co-requisite: Special Education [SPC\_ED] 4300, Literacy Methods.

**SPC\_ED 4371. Literacy in Special Education II. 3 Credits.**

Advanced study in literacy methods and research for students with disabilities. Graded on A/F basis only. Prerequisites: Special Education [SPC\_ED] 4370 or 7370.

**SPC\_ED 4375. Cross Categorical Special Education. 3 Credits.**

Study of characteristics of students with cross categorical disabilities and other pertinent issues including inclusion, assessment, and evaluation practices. Prerequisite: professional standing in Phase II.

**SPC\_ED 4380. Methods in Cross-Categorical Special Education. 4 Credits.**

This course is designed to provide students with research-based instructional and behavior management methods for use with student with cross-categorical disabilities. Prerequisites: professional standing in Phase II, Special Education [SPC\_ED] 4375, 4940.

**SPC\_ED 4390. Methods in Vocational Education for the Disabled and Disadvantaged. 2-3 Credit.**

(same as Learning, Teaching and Curriculum-Vocational [LTC\_V] 4770). Study of legislation, interagency cooperation, curriculum, transition, evaluation/grading role of support personnel. For educators, counselors and administrators working in vocational settings with special needs students and students with disabilities. Prerequisite: Special Education [SPC\_ED] 4300.

**SPC\_ED 4401. Topics in Special Education. 3 Credits.**

In-depth study of certain developments, findings, trends and issues in one or more areas of special education.

**SPC\_ED 4940. Cross-Categorical Special Education: Practicum I. 1-4 Credit.**

Involvement in meaningful field-based activities that extend and/or apply content information from Special Education [SPC\_ED] 4375. Pre/co-requisites: SPC\_ED 4375, professional standing in Phase II.

**SPC\_ED 4941. Practicum in Cross-Categorical II. 3 Credits.**

The purpose of this course is to provide students with experience in applying the content of Special Education [SPC\_ED] 4380 (i.e. assessment and intervention strategies for use with students with cross categorical disabilities). Prerequisites: SPC\_ED 4375 and 4940. Pre/co-requisites: SPC\_ED 4380. This course may be repeated for credit.

**SPC\_ED 4972. Capstone Seminar and Portfolio in Special Education. 1 Credit.**

Students in final student teaching internship will meet weekly to examine and compare their internship experiences. Analysis, synthesis, evaluation and problem solving are the focus of the examination of various aspects of pedagogy and experience. Additionally, students will develop and submit for scoring their State mandated certification portfolio. Prerequisites: Learning, Teaching and Curriculum [LTC] 4971, concurrent enrollment in final semester of student teaching internship.

**SPC\_ED 7020. Foundation of Teacher Prep II. 3 Credits.**

Addresses topics in the foundations of pedagogy including classroom management, behavior management, and students with special needs. Graduate project required. Prerequisite: Education, School and Counseling Psychology [ESC\_PS] 7000. Graded on A-F basis only.

**SPC\_ED 7300. Introduction to Special Education. 3 Credits.**

Introductory overview of the field of special education; historical developments, characteristics of special populations, and compliance with state and federal regulations. Prerequisite: graduate standing.

**SPC\_ED 7305. Introduction to Special Education for Regular Educators. 3 Credits.**

Introduction to the field of special education for other majors; survey of exceptionalities with emphasis on the mainstreaming exceptional students. Prerequisite: graduate standing.

**SPC\_ED 7310. Behavioral Management for Exceptional Students. 3 Credits.**

Study of classroom management and applied behavior analysis strategies. Focus on teacher as decision-maker in the design, implementation, evaluation of individual and group management programs. Prerequisite: graduate standing and Special Education [SPC\_ED] 4300.

**SPC\_ED 7320. Assessment and Evaluation in Special Education. 3 Credits.**

Procedures and instruments used in the assessment of individual with disabilities, including standardized and non-standardized measures of intellectual ability, academic achievement, oral language, social/emotional behaviors, career/vocational needs. Prerequisite: graduate standing and Special Education [SPC\_ED] 4300.

**SPC\_ED 7325. Language Development of Exceptional Students. 3 Credits.**

Study of language and communication issues and disorders in special education; normal and atypical language development; language assessment and intervention models and programs. Prerequisite: graduate standing and Special Education [SPC\_ED] 4300.

**SPC\_ED 7330. Collaboration and Consultation in Special Education. 3 Credits.**

Study of communication, problem-solving, collaboration strategies. Application of strategies to work with exceptional students, their families, other professional members of interdisciplinary, interagency teams. Prerequisites: graduate standing and Special Education [SPC\_ED] 4300.

**SPC\_ED 7370. Literacy in Special Education. 3 Credits.**

Addresses specific literacy needs of special needs students with a focus on assessment and instruction for special needs students in regular classrooms. Pre co-requisite: graduate standing and Special Education [SPC\_ED] 4300, Literacy Methods.

**SPC\_ED 7371. Literacy in Special Education II. 3 Credits.**

Advanced study in literacy methods and research for students with disabilities. Graded A-F only. Prerequisites: Special Education [SPC\_ED] 4370 or 7370.

**SPC\_ED 7375. Cross Categorical Special Education. 3 Credits.**

Study of characteristics of students with cross categorical disabilities and other pertinent issues including inclusion, assessment, and evaluation practices. Prerequisite: graduate standing and professional standing in Phase II.

**SPC\_ED 7380. Methods in Cross-Categorical Special Education. 4 Credits.**

This course is designed to provide students with research-based instructional and behavior management methods for use with student with cross-categorical disabilities. Prerequisites: graduate standing and professional standing in Phase II, Special Education [SPC\_ED] 4375, 4940.

**SPC\_ED 7390. Methods in Vocational Education for the Disabled & Disadvantaged. 2-3 Credit.**

(same as Learning, Teaching and Curriculum-Vocational [LTC\_V] 7770). Study of legislation, interagency cooperation, curriculum, transition, evaluation/grading role of support personnel. For educators, counselors and administrators working in vocational settings with special needs students and students with disabilities. Prerequisite: graduate standing and Special Education [SPC\_ED] 4300.

**SPC\_ED 7401. Topics in Special Education. 3 Credits.**

In-depth study of certain developments, findings, trends and issues in one or more areas of special education. Prerequisite: graduate standing.

**SPC\_ED 7940. Cross-Categorical Special Education: Practicum I. 3 Credits.**

Involvement in meaningful field-based activities that extend and/or apply content information from Special Education [SPC\_ED] 4375. Pre/co-requisites: graduate standing and SPC\_ED 4375, professional standing in Phase II.

**SPC\_ED 7941. Practicum in Cross-Categorical II. 3 Credits.**

The purpose of this course is to provide students with experience in applying the content of Special Education [SPC\_ED] 4380 (i.e. assessment and intervention strategies for use with students with cross categorical disabilities). Prerequisites: graduate standing and SPC\_ED 4375 and 4940. Pre/co-requisites: SPC\_ED 4380. This course may be repeated for credit.

**SPC\_ED 8085. Problems in Special Education. 1-99 Credit.**

Prerequisite: instructor's consent.

**SPC\_ED 8090. Masters Thesis Research Hours. 3 Credits.**

Restricted to students enrolled in the graduate program. Graded S/U only.

**SPC\_ED 8210. Using Assessment to Guide Instruction. 3 Credits.**

This course is designed to present information on the evaluation of individual student skills and the effects of instruction on those skills. Prerequisite: graduate standing. Graded on A/F basis only.

**SPC\_ED 8220. School-Wide Positive Behavior Support. 3 Credits.**

Overview of theory, research, and methods related to establishing a system of positive behavior support in schools. Prerequisite: graduate standing. Graded on A/F basis only.

**SPC\_ED 8287. Professional Seminar in Special Education. 1 Credit.**

Designed to provide overview of Special Education, COE program requirements, and general graduate student expectations. Students STRONGLY encouraged to take course first semester in graduate program. Graded on S/U basis only. Prerequisites: acceptance into a master's degree program.

**SPC\_ED 8300. Students with Behavioral Disorders. 4 Credits.**

Study of characteristics of students with behavioral disorders as they relate to best practices for assessment, instruction, and intervention. Prerequisites: Special Education [SPC\_ED] 4300 and instructor's consent.

**SPC\_ED 8310. Students With Learning Disabilities. 4 Credits.**

Study of characteristics of students with learning disabilities as they relate to best practices for assessment, instruction, and intervention. Prerequisites: Special Education [SPC\_ED] 4300 and instructor's consent.

**SPC\_ED 8340. Advanced Studies in Developmental Disabilities. 3 Credits.**

Current theories and practices and their historic roots through examination of empirical and descriptive literature. Prerequisite: admission to graduate study and instructor's consent.

**SPC\_ED 8345. Trends and Issues in Special Education. 3 Credits.**

A study of the historical developments and related trends, issues and problems associated with the education of exceptional students. Prerequisites: admission to graduate study and instructor's consent.

**SPC\_ED 8350. Research with Exceptional Children. 3 Credits.**

Explores significant, historical, and current research in special education. Emphasizes the application of research, methodology, and findings relative to problems facing the practitioner. Prerequisites: instructor's consent.

**SPC\_ED 8353. Advanced Studies: Single Subject Design. 3 Credits.**

The course is for advanced graduate students in special education, k psychology, related fields and includes behavioral measurement, single subject research designs, data analysis methods, critical analysis and evaluation of single subject research and research proposal. Prerequisite: graduate standing and instructor's consent, Graded on A/F basis only.

**SPC\_ED 8355. Grant Writing. 3 Credits.**

Preparation of research, demonstration, training, or other grant proposals meeting the criteria for competitive funding by a federal agency; review and evaluation of proposals. Prerequisite: admission to graduate study and instructor's consent.

**SPC\_ED 8360. Special Education Administration. 3 Credits.**

Principles, protective safeguards, and general practices associated with the organization and administration of special education; legal foundations for special education; selection, training, and supervision of personnel. Prerequisite: instructor's consent.

**SPC\_ED 8365. Research Design in Special Education. 3 Credits.**

Overview of professional writing and intermediate research applications with a focus on knowledge and skills needed for higher level doctoral work in statistics and research design. Prerequisites: Educational School and Counseling Psychology [ESC\_PS] 4170 or equivalent, Special Education [SPC\_ED] 8150 or equivalent, and instructor's consent.

**SPC\_ED 8370. Foundations I: History, Law and Policy in Special Education. 3 Credits.**

The changing concept of disability will be viewed from the perspectives of history, legal issues, and policy traced from early Greek and European periods through contemporary times. Prerequisites: graduate standing and instructor's consent.

**SPC\_ED 8375. Foundations II: Pedagogical Theories in Special Education. 3 Credits.**

A study of theories of teaching as they apply to special education with emphases on empirically based practices, historical trends, current theories, and the relationship between theories of learning and teaching. Prerequisite: graduate standing and instructor's consent.

**SPC\_ED 8380. Nature and Needs of Gifted and Talented Students. 3 Credits.**

A conceptual and empirical examination for educational personnel of student identification procedures, special populations, programming issues, research topics and teacher competencies. Prerequisite: instructor's consent.

**SPC\_ED 8387. Seminar in Special Education. 1-3 Credit.**

Prerequisite: instructor's consent.

**SPC\_ED 8391. Curriculum Methods for Gifted and Talented Students. 3 Credits.**

A theoretical examination for educational personnel of specific instructional approaches including structure of intellect, enrichment triad, empirical research, and creative problem solving. Prerequisites: Special Education [SPC\_ED] 8380 or instructor's consent.

**SPC\_ED 8400. Affective Development of Gifted Students. 3 Credits.**

Psychosocial development of gifted students; theories, and practices in affective development; strategies to develop positive self-concept, successful coping strategies, and effective peer relationships by gifted students. Prerequisite: Special Education [SPC\_ED] 8380 or instructor's consent.

**SPC\_ED 8405. Assessment and Evaluation in Gifted Education. 3 Credits.**

Seminar focuses on practices for identifying students for gifted education programs, evaluation models applicable to school programs and strategies for grading and evaluation of gifted students. Prerequisite: Special Education [SPC\_ED] 8380 or instructor's consent.

**SPC\_ED 8406. Differentiating Instruction: Reaching Gifted, Typical and Struggling Learners. 3 Credits.**

Explores various instructional approaches to help meet the learning needs of a range of learners from gifted through struggling and at-risk students. Prerequisite: Introduction to Special Education; graduate standing; instructor's consent. Graded on A/F basis only.

**SPC\_ED 8440. Advanced Behavior Management: Applied Behavior Analysis. 3 Credits.**

This course will provide graduate students with advanced theory and knowledge in behavior management. Emphasis will be placed on understanding and using the principles of applied behavior analysis. Prerequisite: Special Education [SPC\_ED] 4310 and instructor's consent.

**SPC\_ED 8455. Advanced Studies in Behavioral Disorders. 3 Credits.**

Contemporary issues a historical perspective; theoretical perspectives or models which guide research, policy, and intervention approaches. Prerequisite: admission to graduate study and instructor's consent.

**SPC\_ED 8470. Advanced Literacy in Special Education. 3 Credits.**

Study of literacy assessment and instruction methods specific to special education; formal and informal assessment: language and instructional strategies to improve literacy for students with disabilities. Prerequisites: Special Education [SPC\_ED] 4300, Literacy Methods. Graduate standing required.

**SPC\_ED 8475. Advanced Studies in Learning Disabilities. 3 Credits.**

Major current issues, trends, and controversies in learning disabilities; theories, research, and practices in learning disabilities. Prerequisite: admission to graduate study and instructor's consent.

**SPC\_ED 8485. Introduction and Methods of Early Intervention. 3 Credits.**

This course will enhance individual knowledge and skills necessary to design, implement, and evaluate research-based strategies and practices in home and center-based programs for infants and toddlers with disabilities, consistent with the philosophical and legal requirements of IDEA Part C.

**SPC\_ED 8490. Assessment in Early Childhood Special Education. 3 Credits.**

Procedures and instruments used in assessment of children with special needs, including screening, diagnosis, interpretation of diagnostic findings, and application to instructional plans. Prerequisite: Special Education [SPC\_ED] 8375.

**SPC\_ED 8495. Introduction and Methods of Early Childhood Special Education. 2-3 Credit.**

This course will enhance individual knowledge and skills necessary to design, implement, and evaluate research-based strategies and practices in community or public school integrated programs for preschools with disabilities, consistent with the philosophical and legal requirements of IDEA Part B Section 619.

**SPC\_ED 8505. Advanced Studies in Early Childhood Special Education. 3 Credits.**

Origins, theoretical perspectives, issues, scope and efficacy of the field of early childhood special education. Prerequisite: graduate standing and instructor's consent.

**SPC\_ED 8520. Meeting the Needs of all Learners. 3 Credits.**

The purpose of this course is to provide information on current research and methodology on teaching students who are struggling or who have disabilities. Open only to teaching fellows. Graded on A/F basis only.

**SPC\_ED 8601. Introduction to Autism. 3 Credits.**

This course provides an introduction of children youth with autism spectrum disorders. Topics include: historical and theoretical foundations, diagnostic and assessment approaches, and characteristics. Prerequisites: Introduction to Special Education; graduate standing; instructor's consent. Graded on A/F basis only.

**SPC\_ED 8602. Methods of Instruction for Students with Autism. 3 Credits.**

Overview of interventions for individuals with autism spectrum disorders and strategies needed for teaching. Best practices and promising practices will be presented. Prerequisite: Special Education [SPC\_ED] 8601, Graduate standing required, Consent of instructor required. Course graded on A/F basis only.

**SPC\_ED 8603. Social Competency for Students with Autism. 3 Credits.**

Course provides a framework for addressing social competence deficits experienced by students with autism. Prerequisite: Special Education

[SPC\_ED] 8601, Graduate standing required, Consent of instructor required. Course graded on A/F basis only.

**SPC\_ED 8604. High Functioning Students with Autism. 3 Credits.**

The course is designed to increase understanding and ability to support individuals on the Autism Spectrum who have average to above average intelligence. Graduate Standing Required. Consent of Instructor Required. Course graded on A/F basis only.

**SPC\_ED 8605. Young Children with Autism. 3 Credits.**

Current research on characteristics, diagnosis, and intervention for very young children with autism. Strategies for support children and their families. Graduate Standing required. Consent of instructor required. Graded on A/F basis only.

**SPC\_ED 8940. Practicum: Students with Behavioral Disorders. 3 Credits.**

Graduate field experience in educational setting for students with behavioral disorders. Application of competencies from Special Education [SPC\_ED] 8300. Prerequisite: instructor's consent.

**SPC\_ED 8941. Practicum: Students with Learning Disabilities. 3 Credits.**

Graduate field experience in educational setting for students with learning disabilities. Application of competencies from Special Education [SPC\_ED] 8310. Prerequisite: instructor's consent.

**SPC\_ED 8942. Practicum: Students with Developmental Disabilities. 3 Credits.**

Graduate field experience in educational setting for students with mental retardation. Application of knowledge and skills from Special Education [SPC\_ED] 8320. Prerequisite: instructor's consent.

**SPC\_ED 8943. Practicum in Special Education. 1-10 Credit.**

Provides graduate practicum experience relevant to the education of exceptional students. Prerequisites: Special Education [SPC\_ED] 4300 and instructor's consent.

**SPC\_ED 8944. Practicum I: Cross-Categorical Special Education. 3 Credits.**

Graduate field-based experience focused on observation and participation in programming for students with mild-moderate disabilities. Prerequisite: instructor's and/or advisor's consent.

**SPC\_ED 8945. Practicum II: Cross-Categorical Special Education. 3-8 Credit.**

Advanced graduate field experience. Demonstration of required competencies with mild-moderate disabilities. Prerequisite: Special Education [SPC\_ED] 8944 and instructor and/or advisor's consent.

**SPC\_ED 8946. Practicum: Gifted Education. 3 Credits.**

Provides graduate field experience in the area of gifted education. Prerequisite: instructor or advisor's consent.

**SPC\_ED 8947. Practicum: Early Childhood Special Education. 1-10 Credit.**

Graduate field experience in an approved setting for young children with special needs. May be repeated. Prerequisite: instructor's consent.

**SPC\_ED 9090. Research in Special Education. 1-99 Credit.**

Graded on a S/U basis only. Prerequisite: instructor's consent.

**SPC\_ED 9387. Professional Seminar in Special Education. 1 Credit.**

Designed to provide overview of Special Education, COE program requirements, and general graduate student expectations. Students STRONGLY encouraged to take course first semester in graduate

program. Graded on S/U basis only. Prerequisites: acceptance into a master's degree program.

**SPC\_ED 9940. Internship: College Teaching in Special Education. 3 Credits.**

Individually guided and supervised college teaching experiences. Competency based activities using portfolio assessment methods. May be taken more than once. Graded on S/U basis only. Prerequisite: instructor's consent.

**SPC\_ED 9941. Internship: Special Education Research. 1-99 Credit.**

Individually guided research internship with doctoral advisor and/or faculty mentor(s). Opportunity to develop research competencies either on individual or collaborative projects. May be taken more than once. Graded on S/U basis only. Prerequisite: instructor's consent.

**SPC\_ED 9942. Internship: Professional Practice in Special Education. 1-99 Credit.**

Individually guided internship in the public schools and/or agencies serving students with special needs or exceptionalities. Focus on professional practices, administrative practices, and/or evaluation practices. Graded on S/U basis only. Prerequisite: instructor's consent.

## Statistics (STAT)

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**STAT 1200. Introductory Statistical Reasoning. 3 Credits.**

Statistical concepts for critically evaluation quantitative information. Descriptive statistics, probability, estimation, hypothesis testing, correlation and regression. Students may not receive credit if they have received or are concurrently receiving credit for a higher numbered course offered by the Statistics Department. Prerequisite: grade in C range or better in Mathematics [MATH] 1100, 1120, 1160 or 1180 or exemption from College Algebra by examination. Math Reasoning Proficiency Course.

**STAT 1300. Elementary Statistics. 3 Credits.**

Collection, presentation of data; averages; dispersion; introduction to statistical inference, correlation and regression. Students may not receive credit if they have received or are concurrently receiving credit for another course offered by the Statistics Department. Prerequisite: grade in C range or better in Mathematics [MATH] 1100, 1120, 1160, or 1180 or exemption from college algebra by examination. Math Reasoning Proficiency Course.

**STAT 1300H. Elementary Statistics - Honors. 3 Credits.**

Collection, presentation of data; averages; dispersion; introduction to statistical inference, correlation and regression. Students may not receive credit if they have received or are concurrently receiving credit for another course offered by the Statistics Department. Prerequisite: grade in C range or better in Mathematics [MATH] 1100, 1120, 1160, or 1180 or exemption from college algebra by examination. Honors eligibility required. Math Reasoning Proficiency course.

**STAT 1400. Elementary Statistics for Life Sciences. 3 Credits.**

Designed for students studying agriculture and other life sciences. Descriptive statistics, probability, estimation, hypothesis testing, correlation and regression. Students may not receive credit if they have received or are concurrently receiving credit for another course offered by the Statistics Department. Math Reasoning Proficiency Course. Prerequisite: grade in C range or better in Mathematics [MATH] 1100, 1120, 1160, or 1180 or exemption from college algebra by examination.

**STAT 2200. Introductory Statistical Methods. 1 Credit.**

Designed to upgrade the curriculum of Statistics [STAT] 1200 or 1300 or 1400 to the level of Statistics 2500. Students may not receive credit for Statistics 2200 if they have completed a course from the Department of Statistics numbered 2500 or higher. Prerequisites: grade in C range or better in STAT 1200, 1300, or 1400. Math Reasoning Proficiency Course.

**STAT 2500. Introduction to Probability and Statistics I. 3 Credits.**

Designed primarily for students in College of Business. Descriptive statistics, probability, random variables, sampling distributions, estimation, confidence intervals, hypothesis tests. Prerequisite: grade of C- or better in Mathematics [MATH] 1300, 1320, 1400 or 1500. Math Reasoning Proficiency course.

**STAT 2530. Statistical Methods in Natural Resources. 3 Credits.**

Statistical methods, with emphasis on applications to natural resources and including computer exercises. Prerequisite: a college-level computing course and a grade in the C range or better in Mathematics [MATH] 1100, 1120, 1160, or 1180. Math Reasoning Proficiency Course.

**STAT 3500. Introduction to Probability and Statistics II. 3 Credits.**

Continuation of 2500. Coverage of additional topics including: Regression; model building; ANOVA; nonparametric methods; use of a statistical computer package. Prerequisite: grade in the C range of Statistics [STAT] 2200, 2500, 2530, or concurrent enrollment in STAT 2200.

**STAT 4002. Topics in Statistics-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Repeatable with departmental consent. Prerequisites: junior standing and instructor's consent.

**STAT 4050. Connecting Statistics to Middle and Secondary Schools. 3 Credits.**

Primarily for middle and secondary mathematics education majors. Uses standards-based curricular materials to demonstrate connections between college-level statistics and content taught in middle and secondary schools. No credit toward a graduate degree in statistics. Prerequisite: an introductory course in statistics or Mathematics [MATH] 2320 or instructor's consent.

**STAT 4085. Problems in Statistics for Undergraduates. 1-3 Credit.**

Independent investigations. Reports on approved topics. Prerequisite: instructor's consent.

**STAT 4110. Statistical Software and Data Analysis. 3 Credits.**

Programming with major statistical packages emphasizing data management techniques and statistical analysis for regression, analysis of variance, categorical data, descriptive statistics, non-parametric analyses, and other selected topics. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4150. Applied Categorical Data Analysis. 3 Credits.**

The study of statistical models and methods used in analyzing categorical data. The use of computing is emphasized and calculus is not required. No credit for students who have previously completed Statistics [STAT] 4830. No credit toward a graduate degree in statistics. Prerequisite: STAT 3500, 7070, 4710/7710, or 4760/7760 or instructor's consent.

**STAT 4210. Applied Nonparametric Methods. 3 Credits.**

Statistical methods when the functional form of the population is unknown. Applications emphasized. Comparisons with parametric procedures. Goodness-of-fit, chi-square, comparison of several

populations, measures of correlation. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4310. Sampling Techniques. 3 Credits.**

Theory of probability sampling designs. Unrestricted random sampling. Stratified sampling. Cluster sampling. Multistage or subsampling. Ratio estimates. Regression estimates. Double sampling. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4410. Biostatistics. 3 Credits.**

Study of statistical techniques for the design and analysis of clinical trials, laboratory studies and epidemiology. Topics include randomization, power and sample size calculation, sequential monitoring, Carcinogenicity bioassay and case-cohort designs. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4420. Applied Survival Analysis. 3 Credits.**

Parametric models; Kaplan-Meier estimator; nonparametric estimation of survival and cumulative hazard functions; log-rank test; Cox model; Stratified Cox model; additive hazards model partial likelihood; regression diagnostics; multivariate survival data. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710 or 4760/7760 or consent of instructor.

**STAT 4430. Applied Longitudinal Data Analysis. 3 Credits.**

Repeated measurements; event history studies; linear and nonlinear mixed effects models; growth models; marginal mean and rate models; pattern-mixture models; selection models; non-informative and informative drop-out; joint analysis of longitudinal and survival data. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, or 4760/7760 or instructor's consent.

**STAT 4450. Applied Statistical Methods for Bioinformatics. 3 Credits.**

Random variables; Point estimation; Multiple t-test; Likelihood principle; Analysis of variance; Probabilistic methods for sequence modeling; Gene expression analysis; Protein structure prediction; Genome analysis; Hierarchical clustering and Gene classification. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4510. Applied Statistical Models I. 3 Credits.**

Introduction to applied linear models including regression (simple and multiple, subset selection, estimation and testing) and analysis of variance (fixed and random effects, multifactor models, contrasts, multiple testing). No credit toward a graduate degree in statistics. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4530. Analysis of Variance. 3 Credits.**

Study of analysis of variance and related modeling techniques for cases with fixed, random, and mixed effects. Exposure to designs other than completely randomized designs including factorial arrangements, repeated measures, nested, and unequal sample size designs. Prerequisite: Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 4540. Experimental Design. 3 Credits.**

Examination and analysis of modern statistical techniques applicable to experimentation in social, physical or biological sciences. Prerequisite: Statistics [STAT] 3500 or 4510/7510 or 4530/7530 or instructor's consent.

**STAT 4560. Applied Multivariate Data Analysis. 3 Credits.**

Testing mean vectors; Discriminant analysis; Principal components; Factor analysis; Cluster analysis; Structural equation modeling; Graphics.

Prerequisite: Statistics [STAT] 3500, 7070 4710/7710 or 4760/7760 or instructor's consent. No credit towards a graduate degree in statistics.

**STAT 4610. Applied Spatial Statistics. 3 Credits.**

Introduction to spatial random processes, spatial point patterns, kriging, simultaneous and conditional autoregression, and spatial data analysis. Prerequisite: Statistics [STAT] 4510 or instructor's consent. Recommended: basic knowledge of calculus and matrices.

**STAT 4640. Introduction to Bayesian Data Analysis. 3 Credits.**

Bayes formulas, choices of prior, empirical Bayesian methods, hierarchical Bayesian methods, statistical computation, Bayesian estimation, model selection, predictive analysis, applications, Bayesian software. Prerequisite: Statistics [STAT] 3500 or 4510/7510 or instructor's consent.

**STAT 4710. Introduction to Mathematical Statistics. 3 Credits.**

(same as Mathematics [MATH] 4315). Introduction to theory of probability and statistics using concepts and methods of calculus. Prerequisite: MATH 2300 or instructor's consent. No credit for MATH 4315.

**STAT 4750. Introduction to Probability Theory. 3 Credits.**

(same as Mathematics [MATH] 4320). Probability spaces; random variables and their distributions; repeated trials; probability limit theorems. Prerequisite: MATH 2300 or instructor's consent.

**STAT 4760. Statistical Inference. 3 Credits.**

(same as Mathematics [MATH] 4520). Sampling; point estimation; sampling distribution; tests of hypotheses; regression and linear hypotheses. Prerequisite: Statistics [STAT] 4750/7750.

**STAT 4810. Nonparametric Methods. 3 Credits.**

A first course in Non-parametric statistical methods based on ranks. Both theory and application are emphasized. Two-sample problems. K-sample problems. Tests for independence. Contingency tables. Goodness-of-fit tests. Prerequisite: Statistics [STAT] 4710/7710 or 4760/7760 or instructor's consent.

**STAT 4830. Categorical Data Analysis. 3 Credits.**

Discrete distributions, frequency data, multinomial data, chi-square and likelihood ratio tests, logistic regression, log linear models, rates, relative risks, random effects, case studies. Prerequisite: Statistics [STAT] 4710/7710 or 4760/7760 or instructor's consent.

**STAT 4850. Introduction to Stochastic Processes. 3 Credits.**

Study of random processes selected from: Markov chains, birth and death processes, random walks, Poisson processes, renewal theory, Brownian motion, Gaussian processes, white noise, spectral analysis, applications such as queuing theory, sequential tests. Prerequisite: Statistics [STAT] 4750/7750 or instructor's consent.

**STAT 4870. Time Series Analysis. 3 Credits.**

A study of univariate and multivariate time series models and techniques for their analyses. Emphasis is on methodology rather than theory. Examples are drawn from a variety of areas including business, economics and soil science. Prerequisite: Statistics [STAT] 4710/7710 or 4760/7760 or instructor's consent.

**STAT 4970. Senior Seminar. 3 Credits.**

A capstone course required of and open only to senior statistics majors. Students will participate in statistical consulting, attend colloquia, and review articles in professional journals. Writing of reports will be emphasized. Prerequisite: senior statistics major and 12 completed hours of statistics courses or instructor's consent.

**STAT 4999. Departmental Honors in Statistics. 1-3 Credit.**

Special work for Honors candidates in statistics. May be repeated for credit.

**STAT 7002. Topics in Statistics-Biological/Physical/Mathematics. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. Repeatable with departmental consent. Prerequisites: graduate standing and instructor's consent.

**STAT 7020. Statistical Methods in the Health Sciences. 3 Credits.**

Basic inference methods, both parametric and non-parametric, appropriate for answering questions arising in health sciences research. Computer exercises involving data from real experiments from health science area. Prerequisite: Mathematics [MATH] 1100 or 1120 and graduate standing or instructor's consent.

**STAT 7050. Connecting Statistics to Middle and Secondary Schools. 3 Credits.**

Primarily for middle and secondary mathematics education majors. Uses standards-based curricular materials to demonstrate connections between college-level statistics and content taught in middle and secondary schools. No credit toward a graduate degree in statistics. Prerequisite: graduate standing and an introductory course in statistics or Mathematics [MATH] 2320 or instructor's consent.

**STAT 7070. Statistical Methods for Research. 3 Credits.**

Designed for graduate students who have no previous training in statistics. Topics include descriptive statistics, probability distributions, estimation, hypothesis testing, regression, and ANOVA. No credit toward a degree in statistics. Prerequisites: graduate standing and either Mathematics [MATH] 1100 or 1120.

**STAT 7085. Problems in Statistics for Non-majors. 1-99 Credit.**

Approved reading and study, independent investigations, and reports on approved topics. Prerequisites: graduate standing and instructor's consent.

**STAT 7110. Statistical Software and Data Analysis. 3 Credits.**

Programming with major statistical packages emphasizing data management techniques and statistical analysis for regression, analysis of variance, categorical data, descriptive statistics, non-parametric analyses, and other selected topics. Prerequisite: graduate standing and Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7150. Applied Categorical Data Analysis. 3 Credits.**

The study of statistical models and methods used in analyzing categorical data. The use of computing is emphasized and calculus is not required. No credit for students who have previously completed Statistics [STAT] 4830. No credit toward a graduate degree in statistics. Prerequisite: graduate standing; STAT 3500, 7070, 4710/7710, or 4760/7760 or instructor's consent.

**STAT 7210. Applied Nonparametric Methods. 3 Credits.**

Statistical methods when the functional form of the population is unknown. Applications emphasized. Comparisons with parametric procedures. Goodness-of-fit, chi-square, comparison of several populations, measures of correlation. Prerequisite: graduate standing and Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7310. Sampling Techniques. 3 Credits.**

Theory of probability sampling designs. Unrestricted random sampling. Stratified sampling. Cluster sampling. Multistage or subsampling.

Ratio estimates. Regression estimates. Double sampling. Prerequisite: graduate standing Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7410. Biostatistics. 3 Credits.**

Study of statistical techniques for the design and analysis of clinical trials, laboratory studies and epidemiology. Topics include randomization, power and sample size calculation, sequential monitoring, carcinogenicity bioassay and case-cohort designs. Prerequisite: graduate standing and Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7420. Applied Survival Analysis. 3 Credits.**

Parametric models; Kaplan-Meier estimator; nonparametric estimation of survival and cumulative hazard functions; log-rank test; Cox model; Stratified Cox model; additive hazards model partial likelihood; regression diagnostics; multivariate survival data. Prerequisite: Statistics [STAT] 3500, STAT 7070, STAT 4710/7710 or STAT 4760/7760 or instructor's consent.

**STAT 7430. Applied Longitudinal Data Analysis. 3 Credits.**

Repeated measurements; event history studies; linear and nonlinear mixed effects models; growth models; marginal mean and rate models; pattern-mixture models; selection models; non-informative and informative drop-out; joint analysis of longitudinal and survival data. Prerequisite: Statistics [STAT] 3500, STAT 7070, STAT 4710/7710, or STAT 4760/7760 or instructor's consent.

**STAT 7450. Applied Statistical Methods for Bioinformatics. 3 Credits.**

Random variables; Point estimation; Multiple t-test; Likelihood principle; Analysis of variance; Probabilistic methods for sequence modeling; Gene expression analysis; Protein structure prediction; Genome analysis; Hierarchical clustering and Gene classification. Prerequisite: graduate standing and Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7510. Applied Statistical Models I. 3 Credits.**

Introduction to applied linear models including regression (simple and multiple, subset selection, estimation and testing) and analysis of variance (fixed and random effects, multifactor models, contrasts, multiple testing). No credit toward a graduate degree in statistics. Prerequisite: graduate standing and Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7530. Analysis of Variance. 3 Credits.**

Study of analysis of variance and related modeling techniques for cases with fixed, random, and mixed effects. Exposure to designs other than completely randomized designs including factorial arrangements, repeated measures, nested, and unequal sample size designs. Prerequisite: graduate standing and Statistics [STAT] 3500, 7070, 4710/7710, 4760/7760, or instructor's consent.

**STAT 7540. Experimental Design. 3 Credits.**

Examination and analysis of modern statistical techniques applicable to experimentation in social, physical or biological sciences. Prerequisite: Statistics [STAT] 3500 or 4510/7510 or 4530/7530 or instructor's consent.

**STAT 7560. Applied Multivariate Data Analysis. 3 Credits.**

Testing mean vectors; discriminant analysis; principal components; factor analysis; cluster analysis; structural equation modeling; graphics. Prerequisite: Statistics [STAT] 3500, STAT 7070, STAT 4710/7710 or STAT 4760/7760. No credit toward a graduate degree in statistics.



**STAT 7610. Applied Spatial Statistics. 3 Credits.**

Introduction to spatial random processes, spatial point patterns, kriging, simultaneous and conditional autoregression, and spatial data analysis. Prerequisites: Statistics [STAT] 4510/7510 or instructor's consent. Recommended: Basic knowledge of calculus and matrices.

**STAT 7640. Introduction to Bayesian Data Analysis. 3 Credits.**

Bayes formulas, choices of prior, empirical Bayesian methods, hierarchical Bayesian methods, statistical computation, Bayesian estimation, model selection, predictive analysis, applications, Bayesian software. Prerequisite: graduate standing; Statistics [STAT] 3500 or 4510/7510 or instructor's consent.

**STAT 7710. Introduction to Mathematical Statistics. 3 Credits.**

(same as Mathematics [MATH] 7315). Introduction to theory of probability and statistics using concepts and methods of calculus. Prerequisite: graduate standing and MATH 2300 or instructor's consent. No credit MATH 7315.

**STAT 7750. Introduction to Probability Theory. 3 Credits.**

(same as Mathematics [MATH] 7320). Probability spaces; random variables and their distributions; repeated trials; probability limit theorems. Prerequisite: graduate standing and MATH 2300 or instructor's consent.

**STAT 7760. Statistical Inference. 3 Credits.**

(same as Mathematics [MATH] 7520). Sampling; point estimation; sampling distribution; tests of hypotheses; regression and linear hypotheses. Prerequisite: Statistics [STAT] 4750/7750 or instructor's consent.

**STAT 7810. Nonparametric Methods. 3 Credits.**

A first course in Non-parametric statistical methods based on ranks. Both theory and application are emphasized. Two-sample problems. K-sample problems. Tests for independence. Contingency tables. Goodness-of-fit tests. Prerequisite: graduate standing and Statistics [STAT] 4710/7710 or instructor's consent.

**STAT 7830. Categorical Data Analysis. 3 Credits.**

Discrete distributions, frequency data, multinomial data, chi-square and likelihood ratio tests, logistic regression, log linear models, rates, relative risks, random effects, case studies. Prerequisite: graduate standing and Statistics [STAT] 4710/7710 or instructor's consent.

**STAT 7850. Introduction to Stochastic Processes. 3 Credits.**

Study of random processes selected from: Markov chains, birth and death processes, random walks, Poisson processes, renewal theory, Brownian motion, Gaussian processes, white noise, spectral analysis, applications such as queuing theory, sequential tests. Prerequisite: graduate standing and Statistics [STAT] 4750/7750 or instructor's consent.

**STAT 7870. Time Series Analysis. 3 Credits.**

A study of univariate and multivariate time series models and techniques for their analyses. Emphasis is on methodology rather than theory. Examples are drawn from a variety of areas including business, economics and soil science. Prerequisite: graduate standing Statistics [STAT] 7710 or 7760 or instructor's consent.

**STAT 8085. Problems in Statistics for Majors - Masters. 1-99 Credit.**

Approved reading and study, independent investigations, and reports on approved topics. Prerequisites: graduate standing and instructor's consent.

**STAT 8090. Master's Thesis Research in Statistics. 1-99 Credit.**

Graded on a S/U basis only.

**STAT 8100. Special Topics in Statistics. 1-99 Credit.**

Prerequisite: instructor's consent.

**STAT 8220. Applied Statistical Models II. 3 Credits.**

Advanced applied linear models including mixed linear mixed models (fixed and random effects, variance components, correlated errors, split-plot designs, repeated measures, heterogeneous variance), generalized linear models (logistic and Poisson regression), nonlinear regression. No credit toward a graduate degree in statistics. Prerequisites: Statistics [STAT] 4510/7510 or instructor's consent. Graduate standing required.

**STAT 8310. Data Analysis I. 3 Credits.**

Applications of linear models including regression (simple and multiple, subset selection, regression diagnostics), analysis of variance (fixed, random and mixed effects, contrasts, multiple comparisons) and analysis of covariance; alternative nonparametric methods. Prerequisite: Statistics [STAT] 4710/7710 or 4760/7760 or instructor's consent.

**STAT 8320. Data Analysis II. 3 Credits.**

Advanced applications including analysis of designs (e.g. repeated measures, hierarchical models, missing data), multivariate analysis (Hotelling's T<sub>2</sub>, MANOVA, discriminant analysis, principal components, factor analysis), nonlinear regression, generalized linear models, categorical data analysis. Prerequisite: Statistics [STAT] 8310 or instructor's consent.

**STAT 8370. Statistical Consulting. 3 Credits.**

Participation in statistical consulting under faculty supervision. Formulation of statistical problems. Planning of surveys and experiments. Statistical computing. Data analysis. Interpretation of results in statistical practice. Prerequisites: Statistics [STAT] 4760/7760 and 8320 or instructor's consent.

**STAT 8410. Statistical Theory of Bioinformatics. 3 Credits.**

Study of statistical theory and methods underpinning bioinformatics. Topics include statistical theory used in biotechnologies such as gene sequencing, gene alignments, microarrays, phylogenetic trees, evolutionary models, proteomics and imaging. Prerequisite: Statistics [STAT] 4760/7760.

**STAT 8640. Bayesian Analysis I. 3 Credits.**

Bayes' theorem, subjective probability, non-informative priors, conjugate prior, asymptotic properties, model selection, computation, hierarchical models, hypothesis testing, inference, predication, applications. Prerequisites: Statistics [STAT] 4760/7760 and Mathematics [MATH] 4140/7140 or instructor's consent.

**STAT 9085. Problems in Statistics for Majors - PhD. 1-99 Credit.**

Approved reading and study, independent investigations, and reports on approved topics. Prerequisites: graduate standing and instructor's consent.

**STAT 9090. Doctoral Dissertation Research in Statistics. 1-99 Credit.**

Graded on a S/U basis only.

**STAT 9100. Recent Developments in Statistics. 3 Credits.**

The content of the course which varies from semester to semester, will be the study of some statistical theories or methodologies which are currently under development, such as bootstrapping, missing data, non-parametric regression, statistical computing, etc. Prerequisites: Statistics [STAT] 4760/7760 and instructor's consent.

**STAT 9250. Statistical Computation and Simulation. 3 Credits.**

Random number generation, acceptance/rejection methods; Monte Carlo; Laplace approximation; the EM algorithm; importance sampling; Markov chain Monte Carlo; Metropolis-Hasting algorithm; Gibbs sampling,

marginal likelihood. Prerequisites: Statistics [STAT] 4760/7760 or instructor's consent. Graduate standing.

**STAT 9310. Theory of Linear Models. 3 Credits.**

Theory of multiple regression and analysis of variance including matrix representation of linear models, estimation, testing hypotheses, model building, contrasts, multiple comparisons and fixed and random effects. Prerequisites: Statistics [STAT] 4760/7760 and Mathematics [MATH] 4140/7140, and instructor's consent.

**STAT 9320. Advanced Linear Models. 3 Credits.**

Advanced topics in the theory and application of linear models. Specific content varies with instructor. Prerequisites: Statistics [STAT] 9310 or instructor's consent.

**STAT 9370. Multivariate Analysis. 3 Credits.**

Distribution of sample correlation coefficients. Derivation of generalized T-squared and Wishart distributions. Distribution of certain characteristic roots, vectors. Test of hypotheses about covariance matrices and mean vectors. Discriminant analysis. Prerequisites: Statistics [STAT] 4760/7760 and Mathematics [MATH] 4140/7140 or instructor's consent.

**STAT 9410. Survival Analysis. 3 Credits.**

Statistical failure models, Kaplan-Meier estimator, Log-rank test, Cox's regression model, Multivariate failure time data analysis, Counting process approaches. Prerequisites: Statistics [STAT] 4760/7760 or instructor's consent.

**STAT 9510. Theory of Nonparametric Statistics. 3 Credits.**

Estimation, hypothesis testing, confidence intervals, etc., when functional form of the population distribution is unknown. Prerequisites: Statistics [STAT] 4760/7760 or instructor's consent.

**STAT 9530. Data Mining and Machine Learning Methods. 3 Credits.**

Approaches to estimating unspecified relationships and findings unexpected patterns in high dimensional data. Computationally intensive methods including splines, classifications, tree-based and bagging methods, support vector machines. Prerequisites: Statistics [STAT] 4110/7110, 4760/7760 and 8320 or instructor's consent.

**STAT 9640. Bayesian Analysis II. 3 Credits.**

Likelihood principle, decision theory, asymptotic properties, advanced topics in Bayesian analysis at the instructor's discretion. Prerequisites: Statistics [STAT] 8640 and 9710 or instructor's consent.

**STAT 9710. Mathematical Statistics I. 3 Credits.**

Theory of estimation and tests of hypotheses including sufficiency, completeness and exponential families. Neyman-Pearson lemma, most powerful tests, similarity and invariance. Bayes and minimum variance unbiased estimates. Confidence intervals and ellipsoids. Prerequisite: Statistics [STAT] 4760/7760 or instructor's consent.

**STAT 9720. Mathematical Statistics II. 3 Credits.**

Asymptotic distributions of maximum likelihood estimators, chi-square and likelihood ratio test statistics. EM algorithm, bootstrap, and introduction to generalized linear models. Prerequisites: Statistics [STAT] 9710, Mathematics [MATH] 4700/7700 or instructor's consent.

**STAT 9810. Advanced Probability. 3 Credits.**

(same as Mathematics [MATH] 8480). Measure theoretic probability theory. Characteristic functions; conditional probability and expectation; sums of independent random variables including strong law of large numbers and central limit problem. Prerequisites: Statistics [STAT] 4750/7750 or MATH 4700/7700 or instructor's consent.

**STAT 9820. Stochastic Processes. 3 Credits.**

(same as Mathematics [MATH] 8680). Markov processes, martingales, orthogonal sequences, processes with independent and orthogonal increments, stationarity, linear prediction. Prerequisite: Statistics [STAT] 9810 or instructor's consent.

## Student Success Center (SSC)

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**SSC 1020. University Freshmen Seminar. 1 Credit.**

(same as INTDSC 1020). To maximize student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by collegiate life. Attainment of an appropriate balance between personal freedom and social responsibility underlies all seminar activities. Prerequisite: Restricted to first time college student. No credit for students who have earned credit for AFNR 1115, INTDSC 1001, IS\_LT 1110, ED\_LPA 3100 or an equivalent first-year orientation course at another institution. Credit restrictions that apply to orientation classes apply to this course. Students are not allowed to be enrolled in SSC 1020 and SSC 1150 in the same semester.

**SSC 1020H. University Freshmen Seminar - Honors. 1 Credit.**

(same as INTDSC 1020). To maximize student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by collegiate life. Attainment of an appropriate balance between personal freedom and social responsibility underlies all seminar activities. Prerequisite: Restricted to first time college student. No credit for students who have earned credit for AFNR 1115, INTDSC 1001, IS\_LT 1110, ED\_LPA 3100 or an equivalent first-year orientation course at another institution. Credit restrictions that apply to orientation classes apply to this course. Students are not allowed to be enrolled in Student Success Center SSC 1020 and SSC 1150 in the same semester. Honors eligibility required.

**SSC 1150. Learning Strategies for College Students. 1-3 Credit.**

Students' learning strategies are assessed, and their needs are given greatest emphasis. Learning through reading and listening are given major consideration as are the corollary skills of vocabulary expansion, studying and note taking.

**SSC 1151. Learning and Motivation. 3 Credits.**

To maximize student's potential to achieve academic success and to adjust responsibly to the individual and interpersonal challenges presented by collegiate life. Restricted to first time college students. No credit for students who have earned credit for Agriculture, Food and Natural Resources [AFNR] 1115; Interdisciplinary Studies [INTDSC] 1001; Information, Science Learning Technologies [IS\_LT] 1110; Education, Leadership and Policy Analysis [ED\_LPA] 3100, or an equivalent first-year orientation course at another institution. Credit restrictions that apply to orientation classes apply to this course. Students not allowed to be enrolled in Student Success Center [SSC] 1020, 1150 or 1151 in the same semester.

**SSC 1500. Disney Internship. 0 Credits.**

Internship: Experiential learning as a "cast member" of the Walt Disney World College Program. Students work for a semester at the Walt Disney World resort and have the option of taking Disney Classes. Prerequisites: instructor's consent; departmental signature. Graded on S/U basis only.

**SSC 2100. Career Explorations. 1-3 Credit.**

Contribution of career development theory to choice of career and/or major. Exploration of personal and social determinants of career choice.

Class consists of lecture, laboratory experiences, and use of facilities at the Career Planning and Placement Center.

**SSC 2150. Tutoring University Students: Theory & Practice. 3 Credits.**

An introduction to tutoring university students. Provides a pedagogical foundation for tutoring college students in content areas. Topics include but are not limited to diversity, the tutoring relationship, plagiarism, learning strategies, and best practices. Students will observe tutorials during the first part of the course and will conduct their own tutorials later in the semester. Graded on A/F basis only. Prerequisite: Instructor's consent.

**SSC 3100. Advanced Disney Internship. 0 Credits.**

Advanced Internship: Experiential learning opportunity with the Walt Disney World College Program. Students work for a semester at the Walt Disney World resort and have the option of taking Disney classes. This is a second internship that is more field-specific and carries with it more responsibilities. Prerequisite: instructor's consent, departmental signature. Graded on S/U basis only.

## **Surgery (SURGRY)**

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**SURGRY 6006. Surgery Clerkship. 6-10 Credit.**

Surgery Clerkship.

**SURGRY 6016. Rural Surgery Clerkship. 6 Credits.**

Rural Surgery Clerkship.

**SURGRY 6106. Remediation 6006 Surgery Clerkship. 6 Credits.**

Surgery Clerkship Remediation. Prerequisite: 6006 Surgery Clerkship, received unsatisfactory grade.

**SURGRY 6383. ABS Surgery Research. 5-10 Credit.**

ABS Surgery Research.

**SURGRY 6385. ABS Surgery Research and Review. 5 Credits.**

ABS Surgery Research and Review.

**SURGRY 6655. Surgical Off-Site Elective. 5 Credits.**

Surgical Off-Site Elective.

**SURGRY 6658. Burn Unit. 5 Credits.**

Burn Unit.

**SURGRY 6661. Surgery Research Elective. 5 Credits.**

Surgery Research Elective.

**SURGRY 6671. Oncology Multidisciplinary. 5 Credits.**

Oncology Multidisciplinary.

**SURGRY 6672. Neuro-Oncology/Radiosurgery. 5 Credits.**

Neuro-Oncology/Radiosurgery.

**SURGRY 6686. Neurosurgery B. 5 Credits.**

Neurosurgery B.

**SURGRY 6687. Advanced Neurosurgery. 5 Credits.**

Advanced Neurosurgery.

**SURGRY 6688. Orthopaedic Surgery Reserach Elective. 5 Credits.**

Student will identify interest in surgical clinical research and other topical areas of orthopaedic surgery. The research will define concepts relevant to the practice of orthopaedic surgery. The student will engage in self-directed learning and evaluation of new information. Prerequisite: Surgery [SURGRY] 6006; level M4.

**SURGRY 6759. General Surgery Externship - Rural. 5 Credits.**

General Surgery Externship - Rural.

**SURGRY 6770. Surgery Rural Elective. 5 Credits.**

The 4th year surgery student will function as a surgical extern and be integrated into the pre-operative, operative, and post-operative care of surgical patients. The student will function as surgical extern with close supervision and one-on-one instruction. Prerequisites: Surgery [SURGRY] 6002 and 6006.

**SURGRY 6774. Otolaryngology - Rural. 3 Credits.**

Otolaryngology - Rural.

**SURGRY 6780. Urology - Rural. 5 Credits.**

Urology - Rural.

**SURGRY 6781. Orthopaedic Surgery A - Rural. 5 Credits.**

Orthopaedic Surgery A - Rural.

**SURGRY 6860. EMERGENCY MEDICINE. 5 Credits.**

EMERGENCY MEDICINE.

**SURGRY 6955. Ambulatory ENT/Urology. 5 Credits.**

Goals/Objectives: This elective will offer students an exposure to ambulatory care in urology and otolaryngology. Students will see a broad range of patients and numerous outpatient procedures. Students will have close supervision during this experience. Both services have a combined outpatient population of 24,000 visits per year. Students will be exposed to numerous situations they would face in a primary care office. Clinic is offered five days per week by each service. Observation in the O.R. is available and attendance at teaching conferences is required. There will be a written exam given at the completion of the 2 weeks of ENT.

**SURGRY 6957. Cardiothoracic Surgery. 5 Credits.**

Cardiothoracic Surgery.

**SURGRY 6958. Surgical off-Site Selective. 5 Credits.**

Surgical off-Site Selective.

**SURGRY 6959. General Surgery Externship. 5 Credits.**

Prerequisites: Surgery AND Internal Medicine Clerkships. Goals/Objectives: 1. Provide the student with ability to function as a first year general surgery house officer with close supervision and one-on-one instruction. 2. Become familiar with pre-operative, operative, and post-operative care of general surgical patients. 3. Become familiar with the graded responsibility structure necessary to ethically conduct post-graduate surgical residency training. 4. Develop bedside patient care skills. 5. Develop reading and clinical research skills necessary for contemporary surgical care. SCHEDULE: Students will function as a first year surgical house officer and be involved in pre-operative, operative and post-operative care of general surgical patients. They will take call (accompanying another surgical house officer) no more frequently than every fourth night. They will attend and participate in general surgery conferences. They will present one case each week to a general surgery attending. This presentation will consist of history, physical exam findings, laboratory and radiology studies, treatments available, treatment chosen, and rationale for that approach (Three recent references regarding the topic are required). Evaluations: Evaluation will be based upon assessment of knowledge, reasoning, and development of clinical skills by faculty and resident staff. Notes: SUGGESTED RESOURCES: Scientific American Surgery, Scientific American, Inc. Sabiston Textbook of Surgery, 16th edition. WB Saunders, Inc. Schwartz Principles of Surgery, 6th edition. McGraw-Hill, Inc. Surgery,

A Problem-Solving Approach. Davis, HB and Sheldon, GF, ed., Mosby, Cameron, Contemporary Surgery.

**SURGRY 6971. Surgical Intensive Care Unit. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: 1. Understand the dynamics of cooperative critical care. 2. Understand the physiology underlying the patient's disease processes, mechanical ventilatory support and hemodynamic monitoring. 3. Be able to plan, deliver and assess a nutritional support regimen. 4. Become familiar with the monitoring techniques including line placement. 5. Develop the ability to write succinct physician progress notes clearly stating: the problems of the patient, the treatments undertaken to deal with those problems, and the effects or results of those treatments. 6. Recognize significant gaps in your medical knowledge and effectively use available resources (faculty, residents, nurses, pharmacists, respiratory therapists, dieticians, published materials) to fill these gaps. CURRICULUM: Students will take call one night per week. Weekends will be covered by participating in and attending morning rounds. The student will have one weekend off during the month. Students will be responsible for X-Ray rounds and keeping the SICU patient board up to date. The student will give an oral presentation to the team on a topic agreed upon by the Department Director. Evaluations: The student will be evaluated on assessment of perceived assets and/or possible weaknesses. Grading will be on the basis of clinical performance and the oral presentation. SUGGESTED RESOURCES: The ICU Book, 2nd ed., Marino, PL, Williams & Wilkins, 1998, 928 pg, and Fundamental Critical Care Support by Society of Critical Care Medicine.

**SURGRY 6972. Surgical Oncology. 5 Credits.**

Surgical Oncology.

**SURGRY 6973. Head and Neck Surgical Oncology. 5 Credits.**

Head and Neck Surgical Oncology.

**SURGRY 6974. Otolaryngology. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: The Otolaryngology student rotation offers learning through participation in daily care of patients, case discussion in conferences, and didactic conferences. All subspecialty areas are included on this rotation, including facial trauma, otology, neurotology, head and neck surgical oncology, facial reconstruction, sinus surgery, pediatric ENT and allergy. Significant outpatient experience is provided and the extent of operating room participation to the student's needs and preferences. The student sees a full spectrum of patients (adult and pediatric) at the University and the VA. The student sees and learns about a variety of outpatient problems during the outpatient segment of this rotation. A wide variety of surgical procedures are observed in the operating room. The residents and faculty encourage an individually tailored learning experience for the student. Supplemental texts and other teaching aids are encouraged. Clinical research projects are available for interested and committed students.

**SURGRY 6975. Pediatric Surgery. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: To gain a working knowledge of a) diagnosis, b) preoperative care, c) surgery, and d) postoperative care of the 1) congenital 2) traumatic 3) oncologic and 4) common surgical conditions affecting infants and children. This rotation is designed for the student planning a career that includes the care of infants and children. CURRICULUM: Attendance on daily rounds and participation in pediatric surgery clinic are mandatory. The student should also be present in radiology for all inpatient and outpatient contrast studies on surgical patients and consults. Operating room exposure can be individualized; the student is expected to be present, but not necessarily scrubbed, for the key portion of each case. Pediatric Surgical

texts can be found in the Medical Library under RD 137, in the Pediatric or Surgery libraries, in the bookstore. Rowe - Essentials of Pediatric Surgery, Holder - Pediatric Surgery, Welch - Pediatric Surgery (4th ed.), Coran - Surgery of the Neonate.

**SURGRY 6976. Plastic Surgery. 5 Credits.**

Prerequisites: Surgery Clerkship Goals/Objectives: The plastic surgery student rotation is considered "hands on" experience for the student rotating in the division of plastic surgery. This is a busy rotation with good opportunity for clinical exposure. The patient population includes all subspecialty areas of plastic surgery including hand and microsurgery, head and neck cancer surgery, congenital deformities, burns, facial trauma, and major reconstruction, as well as cosmetic surgery. On this rotation, the student is expected to have an in-depth opportunity to learn, practice, and hone surgical suturing techniques and to first or second assist on many major surgical procedures. The graphic specialty of plastic surgery is best appreciated by participation and observation and there will be ample opportunity for this. In addition to the ward and major operating room duties, the student will obtain ambulatory patient care exposure by participating in the clinics, in the evaluation of new patients, and the after care of surgery patients. In addition, a significant percentage of the surgery is done as an outpatient and the student should have the opportunity to gain appreciation of the nuances of surgery done in the ambulatory environment. Incumbent to these considerations are exposure and appreciation of cost containment in plastic surgical procedures. There is a series of practical and theoretical conferences including a unique preoperative conference in which all patients are reviewed in-depth with pre- and post-operative slides of the surgical procedures. This preoperative conference allows the opportunity to review all aspects of patient's surgical procedure including ethical issues, efficient expense management, and aspects of patient education attendant to the procedure. A journal club also provides an in-depth exposure to the plastic surgery literature and its evaluation. This rotation is probably best suited to students who desire an exposure in some detail to the technical aspects of surgery. Evaluations: Each student is responsible for presenting a talk during the month of their rotation. This is usually during the last week of your rotation. Grades will not be available until this requirement has been completed.

**SURGRY 6977. Trauma Surgery and Management. 5 Credits.**

Prerequisites: Surgery AND Internal Medicine Clerkship. Goals/Objectives: At the end of the rotation, the student will understand the fundamentals in evaluation of multiple trauma, resuscitation techniques and goals, and in-patient care for the injured patient. The student will be involved with the performance of invasive procedures under the guidance of the Attending and Resident Surgical staff as a member of the trauma team. SCHEDULE: The student will be present daily for morning radiology rounds throughout the work day. Some night and week-end call will be required. STUDENT EVALUATION: The student will be evaluated by the resident and faculty staff based upon their performance during the rotation. In addition, each student will participate in a discussion based oral exam designed to evaluate their understanding of the basics of trauma care. COURSE EVALUATION: Each student will have the opportunity to formally evaluate the course and faculty after completion of the rotation and evaluation process. These evaluations will be used to strengthen the course and its content. Notes: SUGGESTED RESOURCES: 2 1) American College of Surgeons Committee on Trauma: Advanced Trauma Life Support 2) Text Trauma by Moore, Mattox, Feliciano: Trauma, Apelton and Lang.

**SURGRY 6979. Vascular Surgery. 5 Credits.**

Vascular Surgery.

**SURGRY 6980. Urology. 5 Credits.**

Goals/Objectives: The goal of the rotation is to provide a comprehensive urologic experience for those students who may be interested in Urology as a career as well as those students who simply want a more in-depth experience before pursuing another specialty. At the conclusion of the rotation, the student will be able to competently manage common urologic conditions such as hematuria, incontinence, and erectile dysfunction and recognize those patients who need referral to a specialist. To accomplish this, emphasis is placed on the management of both outpatients and inpatients. Active participation in the operating room is expected and the student will assist in a wide variety of urologic procedures. Students will also participate in outpatient procedures such as cystoscopy and vasectomy. Basically, the student will function as an extern on the University Urologic Service with appropriate patient care responsibilities. Mornings will generally be spent on rounds and in the operating room. Students will participate in outpatient clinics in the afternoons followed by rounds. Teaching conferences are held throughout the week and the student will receive a schedule at the beginning of the rotation. Evaluations: There is no written exam at the end of the rotation. The student is evaluated by the faculty and residents based on their observations of the student on rounds, in the clinic, in the operating room and in conferences. Participation is accorded high value as is the demonstration of a basic fund of urologic knowledge. Notes: Conferences are held Monday evenings at 5:30 pm and Wednesday mornings at 8:00 am. Times are subject to change. Both conferences focus on uro-radiology. In addition, all operative cases for the upcoming week will be presented on Mondays. Didactic sessions will be held on Wednesdays in conjunction with conference. Students will meet with a faculty member on Wednesday following conference for a tutorial session. Prerequisites: Surgery Clerkship.

**SURGRY 6981. Orthopaedic Surgery Sub-Internship. 5 Credits.**

Goals/Objectives: Rotation for students actively interested (more aggressive) students in orthopaedics as a career. Emphasis will be placed on surgical indications, operative technique and post-operative care of orthopaedic patients. The student will be assigned by Ortho faculty to two different orthopaedic teams (sports medicine, foot and ankle, total joint, general, pediatrics, trauma, and hand) for two weeks at a time. Each student would be given an extensive reading schedule, a list of topics to be covered, given a written or oral examination including both services emphasized at the end of block. Brief oral presentation, to the residency or service on which they are working, on orthopaedic subject of choice pertaining to Ortho service/residency assigned. CURRICULUM: The student will spend two weeks on two different university teams during this rotation. The student will be expected to participate in all aspects of the orthopaedics services they are assigned. This will include outpatient clinics, elective and emergent OR time, routine day-to-day care of patients on the orthopaedic service, and consultations. The student will take four nights of call with the Ortho residents assigned to service. The student will be evaluated by the attending and residents on the two services to which they have been assigned. Prerequisites: Surgery Clerkship.

**SURGRY 6982. Introduction to Orthopaedic Surgery. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: Rotations for students interested in a career in primary care. The student will learn physical diagnosis and outpatient as well as surgical treatment of common orthopedic conditions. Each student will be given a list of topics that will be covered, a reading list to which the student would be obligated to read and given a short written and/or oral examination of the musculoskeletal system emphasized. Brief oral presentation, to the

residency or service on which they are working, on an orthopedic subject of choice pertaining to Ortho service/residency assigned. The student will be assigned for the four weeks by Ortho Faculty to a preceptor from one of the following areas: sports medicine, foot and ankle, total joint, general, pediatrics, trauma or hand. CURRICULUM: The student on this rotation will be expected to learn to diagnose and manage commonly seen orthopedic conditions in the assigned orthopedic area. The student will participate in outpatient clinics, OR cases, rounds and conferences. The student will take two call nights with the Ortho Resident assigned to service. Basic techniques of splinting and cast application will be learned by sessions with the orthopedic cast technician.

**SURGRY 6983. Advanced Orthopaedic Surgery. 5 Credits.**

Advanced Orthopaedic Surgery.

**SURGRY 6985. Neurosurgery A. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: This course will provide the conscientious student an opportunity to acquire the following: 1. The ability to perform comprehensive neurological evaluation of the patient including both history taking and physical examination. This will entail a review of basic neuroanatomy and neurophysiology and a correlation of that information with the requirements of clinical medicine. 2. A basic understanding of neurosurgical diseases and their evaluation and management. Of particular importance will be the emphasis placed upon the initial evaluation of patients with central and peripheral nervous system trauma and neoplasms, cerebrovascular disease, congenital diseases of the nervous system, pain problems, diseases of the spine and lumbar discs. CURRICULUM: In order to direct the objectives of this course, students will be exposed to the following: 1. Individualized teaching sessions with the faculty. 2. Combined conferences with neurology, neuroradiology and neuropathology. 3. Outpatient clinics at the UMHSC and EFCC (Ellis Fischel). 4. The inpatient services of neurosurgery at UMHSC. 5. The operating room at UMHSC. Evaluations: The progress of the student will be evaluated through personal interaction with the faculty and residents and through an oral examination at the end of the course.

**SURGRY 6986. Bariatric Surgery. 5 Credits.**

Bariatric Surgery.

**SURGRY 6988. Critical Care Neurosurgery. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: The student will gain experience with the clinical evaluation of patients with critical care neurosurgical problems such as head trauma, subarachnoid hemorrhage, and spinal cord injury. The student will perform neurologic assessments, evaluate laboratory data and participate in the decision making on patients with these disorders. CURRICULUM: 1. Daily inpatient rounds in the MNICU, SICU and CCU on the neurosurgical patients. 2. Individualized teaching with faculty. 3. Conferences: Neurosurgery Grand Rounds, Neuro-radiology, Neuro-pathology, Neuroscience. Evaluations: By interactions with faculty and residents and oral examination at the end of the rotation.

**SURGRY 6989. Pediatric Neurosurgery. 5 Credits.**

Prerequisites: Surgery Clerkship. Goals/Objectives: To provide interested students the opportunity to acquire exposure and knowledge in the field of pediatric neurosurgery. This elective will allow the student to learn about clinical entities such as craniofacial anomalies, hydrocephalus, neuroendoscopy, congenital and central nervous system anomalies, and trauma of the CNS. The student becomes part of a team and closely interacts with the attending physician, neurosurgery residents, and clinical nurse specialist. CURRICULUM: 1. Daily inpatient rounds. 2. Individualized teaching with faculty. 3. Clinics: Chiari and Pediatric

Neurosurgery. 4. Conferences: Neurosurgery Grand Rounds, Neuro-radiology, Neuro-pathology, Neuroscience.

## Textile And Apparel Management (T\_A\_M)

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### **T\_A\_M 1100. Introduction to the Textile and Apparel Industry. 3 Credits.**

Surveys the development, production and marketing of softgoods merchandise from concept to consumer.

### **T\_A\_M 1200. Basic Concepts of Apparel Design and Production. 3 Credits.**

Introduction to design techniques, coordination of fabric with design, selection of support materials, and basic understanding of garment assembly operations.

### **T\_A\_M 1300. Softgoods Retailing. 3 Credits.**

Surveys merchandising and retailing principles with specific applications to the softgoods industry.

### **T\_A\_M 2120. Professional Seminar. 1 Credit.**

Exploration of issues in professional activity/success including: evaluating opportunities, oral and written communication for presenting oneself, the articulation of professional/private life, and professional ethics.

### **T\_A\_M 2200. Science of Textiles. 3 Credits.**

Fundamental concepts of textiles. Chemical composition, molecular arrangement, and physical structure of natural and manufactured fibers. Yarn and fabric manufacturing and various finishing techniques. Impacts of such characteristics and techniques on function, performance, and quality. Graded A-F only.

### **T\_A\_M 2280. Apparel Production. 4 Credits.**

Introduction to sewn products industry applications in which students assemble sample garments and products on industrial equipment. Order of operations is emphasized and industry specific software is introduced. Prerequisite: T\_A\_M 1200, T\_A\_M 2200 or taking concurrently.

### **T\_A\_M 2300. Retail Finance and Merchandise Control. 3 Credits.**

Emphasizes assortment and financial planning utilizing computer applications in the retail environment. Prerequisites: Textile and Apparel Management [T\_A\_M] 1300 or Marketing [MRKTNG] 3000, Mathematics [MATH] 1100 and computer familiarity. Math Reasoning Proficiency Course.

### **T\_A\_M 2380. Integrated Apparel Design and Production I. 3 Credits.**

A beginning apparel product development course integrating patternmaking, apparel assembly decision-making and materials selection. Graded on A/F basis only. Prerequisites: Textile and Apparel Management [T\_A\_M] 2280 and instructor's consent.

### **T\_A\_M 2400. Global Consumers. 3 Credits.**

This course uses consumer behavior and cultural frameworks, integrated with critical and creative thinking processes to develop global perspective that is sensitive to diverse consumers' needs and preferences for products and services in the global marketplace. Graded on A/F basis only.

### **T\_A\_M 2480. Apparel and Textile Presentation Techniques. 3 Credits.**

Apparel and textile presentation processes. Introduction to a range of traditional and innovative presentation techniques using various media. Graded A-F basis only. Prerequisites: T\_A\_M 2380 or taken concurrently.

### **T\_A\_M 2500. Social Appearance in Time and Space. 3 Credits.**

An investigation of the motives and meanings that individuals negotiate through the use of dress in presenting themselves as players in complex social contexts. The emphasis is on cross-cultural, historical, and contemporary settings. Prerequisite: English [ENGLSH] 1000.

### **T\_A\_M 2580. Digital Textile and Apparel Applications. 3 Credits.**

Use of computer aided design technology to create designs for textiles and apparel. Includes portfolio development. Graded on A-F basis only. Prerequisite: T\_A\_M 2380 or taken concurrently.

### **T\_A\_M 3001. Recent Trends in Textiles and Apparel Management. 1-3 Credit.**

For upper-class students who wish additional knowledge and understanding in specific subject matter areas.

### **T\_A\_M 3110. Textiles and Apparel in the Global Economy. 3 Credits.**

Economic, social, and political dimensions of the textile complex and trade in a global economy; implications for production, distribution, and consumption of products. Prerequisite: Textile and Apparel Management [T\_A\_M] 1100 and 6 hours of economics.

### **T\_A\_M 3200. Softgoods Quality Evaluation. 3 Credits.**

Examination and evaluation of fabric and apparel structures with emphasis on principles of advanced textile performance and quality analysis. Includes end-use characteristics; price/quality relationships; textile and apparel product standards and specifications; and standard test methods to evaluate comfort, performance, and function of sewn products. Graded on A-F basis only. Prerequisite: T\_A\_M 2200.

### **T\_A\_M 3210. Computer Aided Design. 3 Credits.**

Use of computer aided design technology to create designs for textiles and apparel. Prerequisite: instructor's consent.

### **T\_A\_M 3280. Principles of Apparel Manufacturing. 3 Credits.**

A study of the apparel manufacturing industry including the decision making involved in marketing, merchandising, and producing apparel. Prerequisites: Textile and Apparel Management [T\_A\_M] 1200, T\_A\_M 2200 or instructor's consent.

### **T\_A\_M 3281. Principles Apparel Manufacturing Lab. 1 Credit.**

Emphasis on computer technology applications using industry based systems of digitizing and marker making. Should be taken concurrently with Textile and Apparel Management [T A M] 3280.

### **T\_A\_M 3300. Retail and Merchandising Analysis. 3 Credits.**

This course provides an opportunity to apply the concepts of merchandise planning, financial control, and promotions to real life buying situations. It will employ Problem Based Learning, approach that will allow students to learn through engagement in real problems. Graded on A-F basis only. Prerequisite: T\_A\_M 2300.

### **T\_A\_M 3380. Integrated Apparel Design and Production II. 3 Credits.**

An intermediate apparel product development course integrating patternmaking, apparel assembly decision-making and materials selection. Prerequisite: Textile and Apparel Management [T\_A\_M] 2380. Graded on A-F basis only.

**T\_A\_M 3410. The Clothing/Textile Consumer: Research and Analysis. 3 Credits.**

Examines the effects of economic, social and marketing factors on the clothing consumption process. Legislative and quality issues related to clothing and textiles are also discussed. Prerequisites: 3 hours of merchandising or marketing or microeconomics; 3 hours in statistics.

**T\_A\_M 3480. Technical Design. 3 Credits.**

Technical product development for the global sewn products industry. Graded on A-F only basis. Prerequisite: T\_A\_M 3380 and T\_A\_M 3281 or taken concurrently.

**T\_A\_M 3510. History of Western Dress. 3 Credits.**

Surveys the history of Western dress from prehistory through the 18th Century. Prerequisite: English [ENGLSH] 1000.

**T\_A\_M 3700. MultiChannel Retailing in the Digital World. 3 Credits.**

Overview of various channels of retail distribution including catalogs, e-commerce, and broadcast formats. Graded on A-F basis only. Prerequisite: junior standing.

**T\_A\_M 4001. Topics in Textiles and Apparel Management. 1-99 Credit.**

Selected current topics in field of interest.

**T\_A\_M 4085. Problems in Textiles and Apparel Management. 1-99 Credit.**

Selected current problems in field of interest. Prerequisites: junior standing and instructor's consent.

**T\_A\_M 4087. Seminar in Textiles and Apparel Management. 1-4 Credit.**

Reports and discussion of recent work in area of concentration.

**T\_A\_M 4100. Electronic Commerce Applications. 3 Credits.**

Integration of theory, design, management, and application processes used in Electronic Commerce. Prerequisite: Textile and Apparel Management [T\_A\_M] 3100.

**T\_A\_M 4110. Global Sourcing. 3 Credits.**

Global sourcing refers to how and where manufactured goods or components will be procured. In today's global softgoods industry, sourcing has become a major competitive strategy for both manufacturers and retailers. Graded on A/F basis only. Prerequisite: junior standing required.

**T\_A\_M 4130. Supply Chain Management. 3 Credits.**

This course examines how the supply chain management can be used to gain a competitive advantage in the softgoods industry. Prerequisite: Textile and Apparel Management [T\_A\_M] 3110 and junior standing.

**T\_A\_M 4200. Fundamentals of E-Commerce. 3 Credits.**

An overview of the development, present status, barriers, and future of e-commerce from a managerial point of view. Prerequisite: junior standing.

**T\_A\_M 4300. Softgoods Brand Management. 3 Credits.**

Management of branded product lines produced by textile and apparel firms; strategic implications of the development of brand equity toward increasing customer loyalty. Prerequisites: Textile and Apparel Management [T\_A\_M] 1100 or 1300 and Marketing [MRKTNG] 3000.

**T\_A\_M 4310. Global Retailing. 3 Credits.**

This course will examine how to apply retail concepts and activities to overseas markets, how to evaluate potential overseas markets, and how to develop global retail strategies. Prerequisite: Textile and Apparel Management [T\_A\_M] 1300.

**T\_A\_M 4480. Creativity and Problem Solving. 3 Credits.**

Exploration of the creative process and sources of inspiration. Emphasis on research, design development for a variety of markets. Prerequisite: Textile and Apparel Management [T\_A\_M] 3380. Graded A-F only.

**T\_A\_M 4500. History of Textile Manufacturing and Trade. 3 Credits.**

Focuses on changing issues affecting the textile and apparel industry today and examines those issues from both historic and current perspectives. Prerequisite: Textile and Apparel Management [T\_A\_M] 2500 or T\_A\_M 3510 or instructor's consent.

**T\_A\_M 4510. 19th and 20th Century Western Dress. 3 Credits.**

A study of nineteenth and twentieth century Western dress as influenced by time, place, and culture. Prerequisites: Textile and Apparel Management [T\_A\_M] 2500 or T\_A\_M 3510, or Theatre [THEATR] 1320 or instructor's consent.

**T\_A\_M 4549. International Experiential Learning in Textiles and Apparel. 1-99 Credit.**

International experience of textile and apparel management, including visitation of foreign industries, government agencies, and cultural/historical sites. Destination may vary. Course may be repeated up to 3 times. Prerequisite: instructor's consent; Minimum GPA of 2.5. Graded on A/F basis only.

**T\_A\_M 4820. Concluding Seminar, MU Global Connect. 3 Credits.**

This interdepartmental course serves as the concluding seminar for students pursuing the certificate of digital global studies. The course examines the ways in which people across the globe are affected every day by an unprecedented array of linkages that defy geographic and political boundaries.

**T\_A\_M 4949. Field Training in Textiles and Apparel Management. 1-99 Credit.**

Practical aspects of internship experience coordinated with the university curriculum. Available for various areas of emphasis. Prerequisites: 2.5 GPA, Textile and Apparel Management [T\_A\_M] 2120, instructor's consent, and necessary prerequisite for area of emphasis.

**T\_A\_M 4960. Readings in Textiles and Apparel Management. 1-99 Credit.**

Selected current readings in field of interest. Prerequisites: senior standing and instructor's consent.

**T\_A\_M 4980. Apparel Production Management. 4 Credits.**

Integration of consumer, trend and aesthetic research to develop and produce a competitive apparel product line using a multifunctional team approach. Graded on A/F basis only. Prerequisites: Textile and Apparel Management [T\_A\_M] 3840 or 4480 or taking currently.

**T\_A\_M 4990. Retail Marketing and Merchandising. 3 Credits.**

Analytical management techniques appropriate for evaluation of retailing productivity. Emphasis on the use of these techniques and others in the development of a comprehensive retail marketing strategy. Prerequisites: Textile and Apparel Management [T\_A\_M] 2300, Accounting [ACCTCY] 2036, Marketing [MRKTNG] 3000.

**T\_A\_M 4998. Experiential Learning in Textiles and Apparel. 1-99 Credit.**

This course is designed to provide students with hands-on-experiences in the softgood industry. The purpose is to link classroom learning to business cultural centers, museums, workshops, and/or service learning opportunities achieved through experiential study. Additional field study fees might be applicable, depending on experience. Prerequisite:

instructor's consent and minimum GPA of 2.5. May be repeated for credit. Graded on A/F basis only.

**T\_A\_M 7001. Topics in Clothing and Textiles. 1-99 Credit.**

Selected current topics in field of interest. Prerequisite: graduate standing.

**T\_A\_M 7085. Problems in Clothing and Textiles. 1-99 Credit.**

Selected current readings in field of interest. Prerequisites: 3000-level course in field of problems and instructor's consent.

**T\_A\_M 7087. Seminar in Clothing and Textiles. 1-99 Credit.**

Reports and discussion of recent work in area of concentration. Prerequisite: graduate standing.

**T\_A\_M 7110. Global Sourcing. 3 Credits.**

Global sourcing refers to how and where manufactured goods or components will be procured. In today's global softgoods industry, sourcing has become a major competitive strategy for both manufacturers and retailers. Prerequisite: graduate standing and Textile and Apparel Management [T\_A\_M] 3110 or 9100.

**T\_A\_M 7120. Electronic Commerce Applications. 3 Credits.**

Integration of theory, design, management, and application processes used in electronic commerce. Prerequisite: graduate standing and Textile and Apparel Management [T\_A\_M] 3100.

**T\_A\_M 7140. Web-Based Marketing Research. 3 Credits.**

This project-oriented course will focus on principles of marketing research applicable to textile/apparel online environments. Students will learn how to develop, utilize, and analyze web-based research. Prerequisites: 3 hours of statistics and graduate standing.

**T\_A\_M 7200. E-Commerce. 3 Credits.**

An overview of the development, present status, barriers, and future e-commerce from a managerial point of view. Prerequisite: graduate standing.

**T\_A\_M 7300. Branding. 3 Credits.**

Management of branding product lines produced by textile and apparel firms; strategic implications of the development of brand equity toward increasing customer loyalty. Prerequisites: graduate standing.

**T\_A\_M 7310. Global Retailing. 3 Credits.**

This course will examine how to apply retail concepts and activities to overseas markets, how to evaluate potential overseas markets, and how to develop global retail strategies. Prerequisite: graduate standing.

**T\_A\_M 7500. History of Textile Manufacturing and Trade. 3 Credits.**

Focuses on changing issues affecting the textile and apparel industry today and examines those issues from both historic and current perspectives. Prerequisite: graduate standing.

**T\_A\_M 7960. Readings in Clothing and Textiles. 1-99 Credit.**

Readings in recent research material in textiles and/or clothing. Prerequisites: graduate standing, 20 hours in Textile and Apparel Management [T\_A\_M], and instructor's consent.

**T\_A\_M 7980. Softgoods Product Development. 3 Credits.**

Integration of consumer, trend and aesthetic research to develop and produce a competitive apparel product line using a multi-functional team approach. Prerequisites: Textile and Apparel Management [T\_A\_M] 3480 or 4480 or taking concurrently.

**T\_A\_M 7990. Retail Marketing and Merchandising. 3 Credits.**

Analytical management techniques appropriate for evaluation of retailing productivity. Emphasis on the use of these techniques and others in the

development of a comprehensive retail marketing strategy. Prerequisites: Textile and Apparel Management [T\_A\_M] 2300, Accountancy [ACCTCY] 2036, Marketing [MRKTNG] 3000.

**T\_A\_M 7999. International Experiential Learning in Textiles and Apparel. 1-99 Credit.**

Investigation of the complex interaction of manufacturing, marketing, and merchandising in the apparel industry, achieved through instructional and experiential study. Includes international or domestic study trip. Graded on A/F basis only.

**T\_A\_M 8000. Readings in Textiles and Apparel Management. 1-99 Credit.**

Readings in recent research material in textiles and/or clothing. Prerequisites: graduate standing, 20 hours in Textile and Apparel Management [T\_A\_M], and instructor's consent.

**T\_A\_M 8001. Topics in Clothing and Textiles. 1-99 Credit.**

Selected current topics in field of interest. Prerequisite: graduate standing.

**T\_A\_M 8085. Problems in Textiles and Apparel Management. 1-99 Credit.**

Selected current readings in field of interest. Prerequisites: 4000-level course in field of problem and instructor's consent.

**T\_A\_M 8087. Seminar in Clothing and Textiles. 1-99 Credit.**

Reports and discussion of recent work in area of concentration. Prerequisite: graduate standing.

**T\_A\_M 8090. Research in Clothing and Textiles. 1-99 Credit.**

Independent research leading to a thesis. Report required. Graded on S/U basis only.

**T\_A\_M 8130. Supply Chain Management in the Global Softgoods Industry. 3 Credits.**

This course examines supply chain management strategies to gain a competitive advantages in the global softgoods industry. Prerequisite: graduate standing.

**T\_A\_M 8190. Survey of Research in Textile and Apparel Management. 1-6 Credit.**

A survey of current research in textiles and apparel management. Underlying theory, research design and empirical techniques will be analyzed and critiqued. Prerequisites: graduate standing, 3 hours in Statistics and 3 hours in Research Methods.

**T\_A\_M 8410. Applied Research Procedures and Analyses in Textiles and Apparel. 3 Credits.**

Investigation of applied research techniques and analyses used in the field of Textile and Apparel Management. Prerequisites: 3 credits of merchandising, marketing, or microeconomics; 3 credits in computer science [CMP\_SC] and 3 credits in statistics [STAT].

**T\_A\_M 8500. Qualitative Social Research Methods. 3 Credits.**

Focus is on the philosophical differences inherent in an interpretivist versus a positivist approach to social research, the strategies and methods of qualitative research, and qualitative research design and criticism. Prerequisite: graduate standing. May be repeated twice.

**T\_A\_M 8510. Perspectives of 19th and 20th Century Dress. 3 Credits.**

A study of nineteenth and twentieth century western dress as influenced by time, place, and culture. Prerequisites: graduate standing.



**T\_A\_M 8600. Sustainable Softgoods: Global Policies and Practices. 3 Credits.**

This course examines sustainability in the soft goods industry in the context of cultural, economic, environmental, social, and technological policies and procedures of soft goods industries. Includes ethics, government policies international labor standards, environmental regulations, company priorities, consumer responsibilities, economic impact, and worker rights. The importance of establishing leadership for social change will be incorporated. Prerequisite: graduate standing. Graded on A/F basis only.

**T\_A\_M 8960. Readings in Clothing and Textiles. 1-99 Credit.**

Readings in recent research material in textiles and/or clothing. Prerequisites: graduate standing, 20 hours in Textile and Apparel Management [T\_A\_M], and instructor's consent.

**T\_A\_M 9001. Topics in Clothing and Textiles. 1-99 Credit.**

Selected current topics in field of interest. Prerequisite: graduate standing.

**T\_A\_M 9085. Problems in Textiles and Apparel Management. 1-99 Credit.**

Selected current readings in field of interest. Prerequisites: 4000-level course in field of problem and instructor's consent.

**T\_A\_M 9087. Seminar in Clothing and Textiles. 1-99 Credit.**

Reports and discussion of recent work in area of concentration. Prerequisite: graduate standing.

**T\_A\_M 9090. Research in Textiles and Apparel Management. 1-99 Credit.**

Independent research leading to dissertation. Graded on a S/U basis only.

**T\_A\_M 9110. Advanced Textiles and Apparel in the Global Economy. 3 Credits.**

Advanced analysis of economic aspects of the domestic and international textile and apparel industries. Prerequisites: Textile and Apparel Management [T\_A\_M] 1100 and 6 hours of economics.

**T\_A\_M 9150. International Trade in Textiles and Apparel. 3 Credits.**

Economic, social, and political aspects of international production and trade of textiles and apparel. Prerequisites: Economics [ECONOM] 4326, and Textile and Apparel Management [T\_A\_M] 9110, or instructor's consent.

**T\_A\_M 9190. Theory Development and Evaluation in Textile and Apparel Research. 3 Credits.**

This class examines and analyzes extant theories in textiles and apparel research in systemic manner to be able to construct new theories. Prerequisite: graduate standing. Graded on A/F basis only.

**T\_A\_M 9500. Cloth and the Human Experience. 3 Credits.**

Examines the social context of dress and other intimate manifestations of daily life using culture as the level of analysis.

**T\_A\_M 9510. Textile History Seminar. 3 Credits.**

Investigation of research in textile and costume history with emphasis on developing questions, methods of analysis and interpretation appropriate for data sources used. Prerequisite: graduate standing.

**T\_A\_M 9960. Readings in Clothing and Textiles. 1-99 Credit.**

Readings in recent research material in textiles and/or clothing. Prerequisites: graduate standing, 20 hours in Textile and Apparel Management [T\_A\_M], and instructor's consent.

## Theatre (THEATR)

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**THEATR 1005. Topics in Theatre - Humanities/Fine Arts. 1-99 Credit.**

Organized study of selected topics. Subject and credit may vary from semester to semester. May be repeated with departmental consent. Prerequisite: instructor's consent.

**THEATR 1100. The Theatre in Society. 3 Credits.**

Examines the form and meaning of theatre in civilizations of the West from the ancient Greeks to modern times. Restricted to Freshman and Sophomores only.

**THEATR 1200. Voice and Articulation. 2 Credits.**

Techniques for improving speaking voice; theories underlying techniques. Attention to student's articulation, pronunciation, voice quality, general expressiveness.

**THEATR 1250. World Theatre Workshop. 2 Credits.**

(same as Black Studies [BL\_STU] 1250). Provides a diverse ensemble of student performers, writers, and technicians with an intensive immersion in the process of theatrical production through the public presentation of dramatic literature that focuses on global issues of ethnicity and culture.

**THEATR 1320. Beginning Scenic Construction Lab. 3 Credits.**

Practical experience constructing and rigging theatrical scenery, properties, and stage lighting. Requires evening crew assignment.

**THEATR 1340. Beginning Costume Construction Lab. 3 Credits.**

Learn the basic sewing skills used in costume construction, through lecture, demonstration and practical application. Requires evening crew assignment.

**THEATR 1360. Stage Makeup. 1 Credit.**

Character analysis, facial anatomy, color for stage and television makeup. Practice in application.

**THEATR 1400. Acting for Non-Majors. 3 Credits.**

Basic theory and practice of acting for the non theatre major. Restricted to Freshman and Sophomores only.

**THEATR 1420. Stage Movement for the Actor. 2 Credits.**

Basic work in the techniques that comprise movement training for the actor.

**THEATR 1720. African-American Theatre History. 3 Credits.**

(same as Black Studies [BL\_STU] 1720). A historical and critical analysis of the evolution of African American cultural performance in the American theatre and entertainment industry.

**THEATR 2005. Topics in Theatre. 3 Credits.**

Organized study of selected topics. Subject and credit may vary from semester to semester. May be repeated with department consent. Prerequisite: instructor's consent.

**THEATR 2150. African-American Cinema. 3 Credits.**

(same as Black Studies [BL\_STU] 2150). Study of the impact of cinema and the entertainment industry on the social perceptions of African-Americans and on African-American culture.

**THEATR 2200. Introduction to Performance Studies. 3 Credits.**

This course focuses on the writing of adaptations for the stage through performance. Students develop skills in critical reading, writing, listening, speaking and analysis of performance as they study oral and literary texts, autobiography and narratives.

**THEATR 2300. Production Workshop I. 1 Credit.**

Work backstage in support of university theatre productions. Scenery, lighting, costumes, properties or other responsibilities. May be repeated. Prerequisite: instructor's consent. Graded on a S/U basis only.

**THEATR 2330. Stage Management. 3 Credits.**

Study of the role of the theatre stage manager. Practice in becoming effective in planning and stage managing theatre productions. Graded on A/F basis only.

**THEATR 2360. Stagecraft. 3 Credits.**

Fundamentals of properties and scenic construction stressing terminology and practical production experience. Prerequisite: Theatre [THEATR] 1320.

**THEATR 2410. Performance Workshop. 1 Credit.**

Credit for performance in University Theatre Production. Must audition and be cast to receive credit. May be repeated. Graded on S/U basis only.

**THEATR 2510. Introduction to Theatre Design. 3 Credits.**

Design principles and elements as they relate to theatre performance. Use of drawing and creative 3-dimensional exercises to develop design concepts. Recommended to students interested in directing, playwriting, and design for the theatre.

**THEATR 2710. Introduction to Theatre History. 3 Credits.**

Survey of major periods emphasizing the produced play in its historical context.

**THEATR 2800. Principles of Script Analysis. 3 Credits.**

Methodologies of script analysis for theatrical purposes. Extensive writing will be required. Prerequisite: English [ENGLSH] 1000.

**THEATR 2920. Beginning Playwriting. 3 Credits.**

(same as English [ENGLSH] 2560). Study and practice of playwriting fundamentals; emphasizes the one-act play.

**THEATR 3005. Topics in Theatre. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated with departmental consent. Prerequisites: junior standing and instructor's consent.

**THEATR 3005H. Topics in Theatre - Honors. 1-99 Credit.**

Organized study of selected topics. Subjects and earnable credit may vary from semester to semester. May be repeated with departmental consent. Prerequisites: junior standing and instructor's consent. Honors eligibility required.

**THEATR 3100. Summer Repertory Theatre. 1-99 Credit.**

Participation in production of Summer Repertory Theatre. May be repeated. Prerequisite: instructor's consent.

**THEATR 3200. Performance of Literature. 3 Credits.**

(same as English [ENGLSH] 3570 and Communication [COMMUN] 3570). Analysis and oral interpretation of literary works. Graded on A/F basis only. Prerequisite: sophomore standing.

**THEATR 3230. Vocal Performance Technique. 3 Credits.**

This course develops the ability to use the voice as a creative and expressive instrument through a comprehensive study of speech and voice dynamics which include the exploration of proper breathing, relaxation, tonal placement, and non-regional articulation.

**THEATR 3300. Production Workshop II. 1 Credit.**

Credit earned in a technical project in support of a University Theatre production. Scenery, costumes, properties, or other responsibilities. May

be repeated to total of 3 hours. Prerequisite: instructor's consent. Graded on S/U basis only.

**THEATR 3310. Costume Crafts. 3 Credits.**

To develop the skills and techniques needed in executing costume crafts, including millinery, corsetry, painting and dyeing, and embellishment.

**THEATR 3320. Theatrical Patternmaking. 3 Credits.**

Patternmaking for the theatre. Basic knowledge of sewing required. Prerequisite: Theatre [THEATR] 1340 or Textile and Apparel Management [T\_A\_M] 1200.

**THEATR 3330. Advanced Costume Construction. 3 Credits.**

Learn advanced techniques in theatrical costuming through lecture, demonstration and practical application. Prerequisite: Theatre [THEATR] 1340 and instructor's consent.

**THEATR 3340. Scene Painting. 2 Credits.**

Studio practice in techniques of painting scenery for the Theatre. Prerequisite: instructor's consent.

**THEATR 3420. Acting I. 3 Credits.**

Basic theory, practice of acting, stage movement.

**THEATR 3430. Acting II. 3 Credits.**

Script analysis, character and role development in modern and contemporary non-realistic theatrical forms. Rehearsal and presentation of scenes, based on contemporary dramatic and performance theory. Prerequisite: Theatre [THEATR] 2800.

**THEATR 3530. Computer Graphics in Theatre Design. 3 Credits.**

The use of graphics and CAD software to create theatre designs. The course will progress from 2D CAD drafting to 3D image rendering. Prerequisite: sophomore standing.

**THEATR 3540. Advanced Stage Makeup. 2 Credits.**

Advanced practical experience in stage makeup techniques. Projects might include: mask making, ventilation, advanced character applications. Practice in application. Graded on A/F basis only. Prerequisite: Theatre [THEATR] 1360 and instructor's consent.

**THEATR 3550. Sound Design. 3 Credits.**

Beginning sound design for the theatre. Units include basics of researching, recording, and augmenting sound for the use in a theatrical production. Prerequisite: Theatre [THEATR] 1320 and instructor's consent.

**THEATR 3560. Scene Design. 3 Credits.**

Theory/practice of scenic design for the theatre with emphasis on the evolutionary process of design from concept to reality. Prerequisite: Theatre [THEATR] 2510, 3530, or instructor's consent.

**THEATR 3600. Theatrical Directing. 3 Credits.**

Theory and practice of play directing, script selection, casting, play analysis, rehearsal and performance. Prerequisite: Theatre [THEATR] 2800 and instructor's consent.

**THEATR 3700. World Dramatic Literature. 3 Credits.**

(same as English [ENGLSH] 3170). Survey of world drama from Greeks to present, focusing on structure, theory and performance. Prerequisite: Theatre [THEATR] 2710 and 2800.

**THEATR 3750. New American Theatre. 3 Credits.**

Survey of drama of the most recent decade as it documents contemporary mores and amplifies cultural themes. Prerequisite: Theatre [THEATR] 2800.

**THEATR 3770. The Theatre Experience: From Page to Stage and Screen. 3 Credits.**

Stimulates critical thinking about theatrical performance, its relationship to the society of which it is a part, and its past and present significance as an art form, a cultural resource, a social institution, and a commercial enterprise. Prerequisite: sophomore standing; restricted to Journalism Majors.

**THEATR 3920. Intermediate Playwriting. 3 Credits.**

(same as English [ENGLSH] 3560). Intermediate study of the writing process as applied to theatre, leading to the creation of a full-length play to be considered for production. Prerequisite: Theatre [THEATR] 2920 or ENGLSH 2560.

**THEATR 3930. Screenwriting for Television and Film. 3 Credits.**

(same as Film Studies [FILM\_S] 3930). Fundamentals of storytelling utilizing tools and structure used by television and film. Prerequisite: English [ENGLSH] 1000.

**THEATR 4005. Topics in Theatre. 1-99 Credit.**

Organized study of selected topics. Topic and credit may vary semester to semester. May be repeated with department consent. Prerequisite: instructor's consent.

**THEATR 4220. Acting III. 3 Credits.**

Period acting styles. Special projects in interpretation, rehearsal, creation of roles. Prerequisites: Theatre [THEATR] 2800 and 3420 or 3430.

**THEATR 4240. Theory and Practice of Theatre of the Oppressed. 3 Credits.**

(same as Peace Studies [PEA\_ST] 4240). Theory and practice of Augusto Boal's liberatory interactive theatre process, including application of techniques of specific social issues. Prerequisite: instructor's consent.

**THEATR 4460. Musical Theatre Performance. 3 Credits.**

A practical study for the actor of theatrical songs through character analysis, lyric interpretation and movement. A performance course. Prerequisite: instructor's consent.

**THEATR 4530. Stage Lighting Design. 3 Credits.**

Theory and practice of lighting for theatre production. Prerequisite: instructor's consent.

**THEATR 4570. Theatrical Costume Design. 3 Credits.**

Basic practice in costume rendering using charcoal, crayon, ink, watercolor and other media. Costume history, both theatrical and general, will be surveyed. Basic problems of theatre design will be considered. Prerequisite: Theatre [THEATR] 1320 or 1340.

**THEATR 4600. Advanced Directing. 3 Credits.**

Advanced principles of theatrical directing; emphasizes stylistic variations. May be repeated once. Prerequisite: Theatre [THEATR] 3600 and instructor's consent.

**THEATR 4650. Introduction to Dramaturgy. 3 Credits.**

The course focuses on the practice of dramaturgy and the various functions currently performed by the artist/scholar identified as "dramaturg" including research, dramatic criticism/interpretation, new play development, marketing and educational outreach, and textual adaptation.

**THEATR 4700. Studies in Theatre History. 3 Credits.**

Advanced survey of major periods, movements. Prerequisite: senior standing. Repeatable to a maximum of 6 hours with instructor's consent.

**THEATR 4720. American Musicals. 3 Credits.**

(same as Music-History and Literature [MUS\_H\_LI] 4376). Historical survey of the development of the 20th-Century American Musical in Theatre and Film.

**THEATR 4730. Theatre Architecture. 3 Credits.**

Examines the renovation of existing buildings into workable theatre spaces. Includes history of theatre architecture. Prerequisite: instructor's consent.

**THEATR 4800. Studies in Dramatic Theory. 3 Credits.**

Analysis of history, meaning and function of selected concepts of contemporary dramatic and performance theory. Prerequisite: senior standing.

**THEATR 4820. Studies in Dramatic Literature. 3 Credits.**

Advanced survey of major movements, periods, writers. Prerequisite: senior standing. Repeatable to a maximum of 6 hours with instructor's consent.

**THEATR 4830. Studies in Dramatic Criticism. 3 Credits.**

Survey of methods of criticism of scripts and performances. Prerequisite: senior standing.

**THEATR 4920. Advanced Playwriting: Problems. 3 Credits.**

(same as English [ENGLSH] 4560). Advanced study of the writing process as applied to theatre, including theory and practice of special playwriting problems and techniques. Prerequisite: Theatre [THEATR] 3920 or ENGLSH 3560.

**THEATR 4930. Adaptation of Literature for the Stage. 3 Credits.**

(same as English [ENGLSH] 4570). This upper-division course will explore adaptation principles and practices with a variety of forms of literature that were not originally written for the stage.

**THEATR 4935. Adaptation of Literature for Film. 3 Credits.**

(same as Film Studies [FILM\_S] 4935 and English [ENGLSH] 4935). This upper-division course will explore adaptation principles and practices with a variety of forms for literature that were not originally written for film.

**THEATR 4940. Internship in Theatre. 1-6 Credit.**

Internship: Experimental learning as an actor, designer, technician, publicist/manager, or dramaturg with an approved theatre company. Prerequisites: junior/senior standing and departmental consent. S/U graded only.

**THEATR 4960. Directed Readings in Theatre. 1-3 Credit.**

Independent reading, reports. Prerequisite: instructor's consent.

**THEATR 4990. Capstone in Theatre. 1 Credit.**

Theatre experiences and knowledge gained by students are connected through compilation of resume and portfolio. Student will meet with faculty jury to discuss his/her body of theatrical work. Required for senior theatre students. Prerequisite: instructor's consent. Graded on S/U basis only.

**THEATR 7005. Topics. 1-99 Credit.**

Organized study of selected topics. Topic and credit may vary semester to semester. May be repeated with department consent. Prerequisite: graduate standing and instructor's consent.

**THEATR 7220. Acting III. 3 Credits.**

Period acting styles. Special projects in interpretation, rehearsal, creation of roles. Prerequisites: graduate standing Theatre [THEATR] 2800 and 3420 or 3430.

**THEATR 7240. Theory and Practice of Theatre of the Oppressed. 3 Credits.**

(same as Peace Studies [PEA\_ST] 7240). Theory and practice of Augusto Boal's liberatory interactive theatre process, including application of techniques of specific social issues. Prerequisite: instructor's consent.

**THEATR 7530. Stage Lighting Design. 3 Credits.**

Theory and practice of lighting for theatre production. Prerequisite: graduate standing instructor's consent.

**THEATR 7600. Advanced Directing. 3 Credits.**

Advanced principles of theatrical directing; emphasizes stylistic variations. May be repeated once. Prerequisite: graduate standing and Theatre [THEATR] 3600 and instructor's consent.

**THEATR 7700. Studies in Theatre History. 3 Credits.**

Advanced survey of major periods, movements. Prerequisite: graduate standing. Repeatable to a maximum of 6 hours with instructor's consent.

**THEATR 7710. History of American Theatre I. 3 Credits.**

Examination of theatrical literature and production from the beginnings to World War One. Prerequisites: graduate standing and instructor's permission.

**THEATR 7720. History of the American Theatre II. 3 Credits.**

Examination of theatrical literature and production from World War One to the present. Prerequisite: graduate standing and instructor's permission.

**THEATR 7730. Theatre Architecture. 3 Credits.**

Examines the renovation of existing buildings into workable theatre spaces. Includes history of theatre architecture. Prerequisite: graduate standing and instructor's consent.

**THEATR 7800. Studies in Dramatic Theory. 3 Credits.**

Analysis of history, meaning and function of selected concepts of contemporary dramatic and performance theory. Prerequisite: graduate standing.

**THEATR 7820. Studies in Dramatic Literature. 3 Credits.**

Advanced survey of major movements, periods, writers. Prerequisite: graduate standing. Repeatable to a maximum of 6 hours with instructor's consent.

**THEATR 7830. Studies in Dramatic Criticism. 3 Credits.**

Survey of methods of criticism of scripts and performances. Prerequisite: graduate standing.

**THEATR 7920. Advanced Playwriting: Problems. 3 Credits.**

(same as English [ENGLSH] 7560). Advanced study of the writing process as applied to theatre, including theory and practice of special playwriting problems and techniques. Prerequisite: graduate standing and Theatre [THEATR] 3920 or English [ENGLSH] 3560.

**THEATR 7930. Adaptation of Literature for the Stage. 3 Credits.**

(same as English [ENGLSH] 7570). Explores adaptation principles and practices with a variety of forms of literature that were not originally written for the stage. Prerequisite: graduate standing and instructor's consent.

**THEATR 7935. Adaptation of Literature for Film. 3 Credits.**

(same as English [ENGLSH] 7580 and Film Studies [FILM\_S] 7935). This upper-division course will explore adaptation principles and practices with a variety of forms of literature that were not originally written for film.

**THEATR 7950. Introduction to Dramaturgy. 3 Credits.**

This course focuses on the practice of dramaturgy and the various functions currently performed by the artist/scholar identified as

"dramaturg" including research, dramatic criticism/interpretation, new play development, marketing and educational outreach, and textual adaptation. Graduate Standing Required. Graded on A/F basis only.

**THEATR 7960. Directed Readings in Theatre. 1-3 Credit.**

Independent reading, reports. Prerequisite: graduate standing and instructor's consent.

**THEATR 8005. Topics in Theatre. 1-99 Credit.**

Organized study of selected topics. Topic and credit may vary from semester to semester. May be repeated with department consent. Prerequisite: instructor's consent.

**THEATR 8090. Research in Theatre. 1-99 Credit.**

Independent research of advanced nature leading to report. Prerequisite: instructor's consent. Graded on S/U basis only.

**THEATR 8100. Theatre Scholarship. 3 Credits.**

History, goals, and techniques of academic writing in theatre including research, types of studies, primary materials, interpretation, writing techniques, and publication. Prerequisite: graduate standing.

**THEATR 8385. Problems in Theatre. 1-99 Credit.**

Individual study/project not leading to thesis or dissertation. Prerequisite: instructor's consent.

**THEATR 8720. Backgrounds of Modern Theatre Practice. 3 Credits.**

Survey of modern performance theory, aesthetics and practice. Emphasis on European theatre since 1875. May be repeated.

**THEATR 8787. Seminar in Theatre History. 3 Credits.**

Selected problems in theatre history. May be repeated.

**THEATR 8820. Graduate Seminar in Dramatic Literature. 3 Credits.**

This is a course that explores the influence of major playwrights and playwriting in society--specific playwrights and their works are determined by the course professor.

**THEATR 8887. Seminar in Dramatic Theory and Criticism. 3 Credits.**

Selected topics in dramatic theory and criticism. May be repeated.

**THEATR 8960. Directed Readings in Theatre. 1-3 Credit.**

Independent reading, reports. Prerequisite: graduate standing and instructor's consent.

**THEATR 8987. Graduate Seminar in Playwriting. 3 Credits.**

(same as English [ENGLSH] 8560). Seminar in theory, practice, and pedagogy of playwriting, students prepare a mid-term in playwriting theory, a full-length play, a research paper, and a syllabus and lesson plans for an undergraduate playwriting course.

**THEATR 9090. Research in Theatre. 1-99 Credit.**

Research leading to thesis or dissertation. Prerequisite: instructor's consent. Graded on a S/U basis only.

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## Veterinary Biomedical Science (V\_BSCI)

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**V\_BSCI 5011. Veterinary Anatomy. 3 Credits.**

In-depth study of the structure of the horse, ox, sheep, goat, pig and avian species. (Instructional periods 3 and 4).

**V\_BSCI 5012. Veterinary Anatomy with Laboratory. 3 Credits.**

Continuation of Veterinary Biomedical Science 5011. In-depth study of the structure of the horse, ox, sheep, goat, pig and avian species. (Instructional periods 3 and 4).

**V\_BSCI 5020. Developmental Anatomy. 0.5 Credits.**

Provides a comprehensive and rational interpretation of the intricate mechanisms of normal development to better understanding the complex anatomy of the adult. A substantial portion will be dedicated to commonly encountered congenital abnormalities for each major organ system. Prerequisites: 1st year Veterinary students.

**V\_BSCI 5021. Developmental Anatomy. 0.5 Credits.**

Provides a comprehensive and rational interpretation of the intricate mechanisms of normal development to better understanding the complex anatomy of the adult. A substantial portion will be dedicated to commonly encountered congenital abnormalities for each major organ system. Prerequisites: 1st year Veterinary students.

**V\_BSCI 5051. Veterinary Gastrointestinal. 2 Credits.**

Continuation of Veterinary Biomedical Science 5504. Physiology of the gastrointestinal tract, exocrine pancreas and liver. Lecture and lab designed to emphasize principles important to the practice of veterinary medicine.

**V\_BSCI 5052. Veterinary Endocrinology and Reproductive Physiology. 2 Credits.**

Continuation of Veterinary Biomedical Science 5051. Comparative endocrinology and reproductive biology.

**V\_BSCI 5100. Veterinary Neuroscience. 2 Credits.**

A laboratory and lecture-based course emphasizing the applied anatomy and physiology of the nervous system of domestic animals. Prerequisite: first year Veterinary students.

**V\_BSCI 5500. Veterinary Anatomy with Laboratory. 4 Credits.**

Correlative study of the anatomy of domestic and laboratory animals in which the developmental and gross anatomy are integrated. A segment is devoted to neuroanatomy. Dissection includes the dog, cat and common laboratory animals. (Instructional periods 1 and 2).

**V\_BSCI 5502. Veterinary Microscopic Anatomy with Laboratory. 3 Credits.**

A study of microscopic anatomy including cytology, histology of basic tissues and microscopic anatomy of cardiovascular, urinary, respiratory systems and the special senses and integument. (Instructional periods 1 and 2).

**V\_BSCI 5503. Veterinary Microscopic Anatomy. 2 Credits.**

Particular attention to digestive systems, endocrine organs and reproductive systems. (Instructional period 3).

**V\_BSCI 5504. Veterinary Physiology. 5 Credits.**

This course is designed to provide an opportunity and motivation for the student to acquire an understanding of the physiological principles on which rational therapy in medical practice is based. Topics include: Cellular Neurophysiology, Muscle, Cardiovascular, Renal and Respiratory Physiology. The course also encourages the student to apply these principles in solving problems so that it becomes habitual for him or her to think in terms of "mechanisms of action" as he or she approaches a problem in disturbed physiology.

**V\_BSCI 5506. Veterinary Molecular and Cellular Biology. 4 Credits.**

(same as Veterinary Biomedical Sciences [V\_BSCI] 7333) A comprehensive course overviewing molecular and biochemical issues

of cell function especially as related to medicine and the underlying molecular causes of disease.

**V\_BSCI 5507. Veterinary Pharmacology with Laboratory. 3 Credits.**

General principles of pharmacy, pharmacokinetics, and pharmacodynamics, with emphasis on drugs affecting the central and autonomic nervous system, cardiovascular and hematologic systems.

**V\_BSCI 5508. Veterinary Pharmacology. 2 Credits.**

Continuation of Veterinary Biomedical Science 5507. Antiseptics, autocoids, hemostatics and anticoagulants, fluid and electrolytes, reproductive, endocrine, and gastrointestinal drugs.

**V\_BSCI 5509. Veterinary Toxicology. 3 Credits.**

(Same as V\_BSCI 8509) Local and various systemic clinical responses of domestic animals to foreign chemicals including metals, pesticides, water-and food-borne agents, biotoxins, industrial and plant toxins. The principles, mechanism(s) of action, diagnosis, prevention and treatment of chemical intoxications are also presented.

**V\_BSCI 7010. Life Sciences Research: Models and Methods. 3 Credits.**

(same as Biomedical Sciences [BIOMED] 7010). A review of basic laboratory animal and non-animal research models and procedures commonly used in the life sciences area in academia and drug/chemical industry. Prerequisite: Biology or Cell Biology; graduate standing required. Graded on A/F basis only.

**V\_BSCI 7085. Problems in Veterinary Biomedical Science. 1-99 Credit.**

Assignment of special problems or topics for training in research.

**V\_BSCI 7302. Cytology, Histology, and Organology of Domestic Animals I. 3 Credits.**

Detailed study of the structure and function of the cell, basic tissues (epithelium, connective tissue, muscle, nervous tissue) and several organ systems (cardiovascular, lymphatic, integument, digestive, visual, auditory) of domestic mammals and birds. Prerequisites: graduate standing, background in biological sciences, instructor's consent.

**V\_BSCI 7303. Cytology, Histology and Organology of Domestic Animals II. 2 Credits.**

Detailed study of the liver, gallbladder, and pancreas, urinary system, respiratory system, endocrine glands, female reproductive system, placenta, male reproductive system, and integument (hoof and claw) of domestic mammals and birds. Prerequisites: Veterinary Biomedical Science [V\_BSCI] 7303 and instructor's consent.

**V\_BSCI 7307. Embryology and Development of Domestic Animals. 2 Credits.**

Developmental anatomy of domestic animals. Special written report and/or review required. Prerequisites: background in biological science and departmental consent.

**V\_BSCI 7333. Veterinary Cell Biology. 4 Credits.**

(same as Veterinary Biomedical Science [V\_BSCI] 5506). Course material stresses cell biology as related to animal health and medical issues. A comprehensive course overviewing molecular and biochemical issues of cell function especially as related to medicine and the underlying molecular causes of disease. Prerequisite: instructor's consent.

**V\_BSCI 8010. Comparative Anatomy of Cardiovascular System. 1 Credit.**

The systemic and pulmonary circulation. The heart and vessels in detail. One midterm exam and final paper. Laboratory included.

**V\_BSCI 8085. Problems in Veterinary Biomedical Science. 1-99 Credit.**

Selected problems and/or topics for advanced study in special areas to meet needs of individual students.

**V\_BSCI 8090. Research in Veterinary Biomedical Science. 1-99 Credit.**

Open to graduate students with requisite preparation. Research expected to be presented as a thesis. Graded on a S/U basis only.

**V\_BSCI 8100. Veterinary Neuroscience. 2 Credits.**

A laboratory and lecture based course emphasizing the applied anatomy and physiology of the nervous system of domestic animals. Restricted to first year veterinary students or graduate students.

**V\_BSCI 8405. Membrane Structure and Function. 3 Credits.**

The structure and function of biological membranes are examined from a biochemical perspective. Topics include membrane proteins, transport, membrane biogenesis, and analytical techniques. Prerequisites: Veterinary Biomedical Science [V\_BSCI] 7303 or equivalent, graduate standing and instructor's consent.

**V\_BSCI 8409. Advanced Microscopic Anatomy. 1-99 Credit.**

Advanced study of selected topics in vertebrate microscopic anatomy. Special report required. Prerequisites: departmental consent.

**V\_BSCI 8410. Seminar in Veterinary Biomedical Science. 1 Credit.**

Presentation and discussion of investigations and topics in veterinary anatomy-physiology or related fields, by qualified students, instructors, and guests. Prerequisite: departmental consent.

**V\_BSCI 8420. Veterinary Physiology. 5 Credits.**

This course is designed to provide an opportunity and motivation for the student to acquire an understanding of the physiological principles on which rational therapy in medical practice is based. Topics include: Cellular Neurophysiology, Muscle, Cardiovascular, Renal and Respiratory Physiology. The course also encourages the student to apply these principles in solving problems so that it becomes habitual for him or her to think in terms of "mechanisms of action" as he or she approaches a problem in disturbed physiology. Prerequisites: Biochemistry [BIOCHM] 4270 and 4272.

**V\_BSCI 8421. Veterinary Physiology. 5 Credits.**

Continuation of Veterinary Biomedical Science 8420. Physiology of the gastrointestinal tract, exocrine pancreas and liver. Lecture and lab designed to emphasize principles important to the practice of veterinary medicine.

**V\_BSCI 8450. Research in Veterinary Biomedical Science. 1-99 Credit.**

Open to graduate students with requisite preparation. Research expected to be presented thesis.

**V\_BSCI 8509. Veterinary Toxicology. 3 Credits.**

(Same as Veterinary Biomedical Science [V\_BSCI] 5509) Local and various systemic clinical responses of domestic animals to foreign chemicals including metals, pesticides, water-and food-borne agents, biotoxins, industrial and plant toxins. The principles, mechanism(s) of action, diagnosis, prevention and treatment of chemical intoxications are also presented. Graded A/F only. Graduate standing required/.

**V\_BSCI 9090. Research in Veterinary Biomedical Sciences. 1-99 Credit.**

Research in Veterinary Biomedical Sciences. Graded on S/U basis only.

**V\_BSCI 9425. Microvascular Circulatory Function. 3 Credits.**

An in-depth study of microcirculatory structure and function in various tissues with emphasis on recent developments in the understanding of the mechanisms involved in nutrient supply, edema formation, lymphatic function and fluid balance. Prerequisite: Veterinary Biomedical Science [V\_BSCI] 8420 and 8422 or Mammalian Physiology or equivalent.

**V\_BSCI 9431. Control of Energy Metabolism. 1-3 Credit.**

(same as Medical Pharmacology and Physiology [MPP] 9431). This advanced elective is in a lecture/discussion format using primary literature to explore how cells organize and regulate metabolism to meet energy demands. Prerequisite: instructor's consent.

**V\_BSCI 9435. Skeletal Muscle. 3 Credits.**

(same as Medical Pharmacology and Physiology [MPP] 9435). Skeletal muscle structure, contraction, mechanics, metabolism, adaption. Graded on A/F basis only.

**V\_BSCI 9467. Neural Control of the Circulation. 3 Credits.**

(same as Medical Pharmacology and Physiology [MPP] 9437). Course objectives include developing a general understanding of CNS mechanisms in the regulation of the cardiovascular system, including autonomic, neurohumoral and body fluid homeostatic mechanisms, gaining knowledge of the major advances and topics in the field and becoming familiar with some of the methods used to study CNS cardiovascular regulation. Graded on A/F basis only. Prerequisites: instructor's consent.

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## Veterinary Medicine - Interdisciplinary (VMED\_I)

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**VMED\_I 5120. Full-Time Enrollment. 16-99 Credit.**

Full-Time Enrollment.

**VMED\_I 5190. Full-Time Enrollment. 16-99 Credit.**

Full-Time Enrollment.

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## Veterinary Medicine And Surgery (V\_M\_S)

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**V\_M\_S 6005. Clinical Skills. 0.5 Credits.**

A hands -on laboratory class to provide experience with handling and examining Horses, Cattle, Small ruminants and Camelid species, Cats and Dogs for veterinary students. Prerequisite: first year veterinary students. Graded on S/U basis only.

**V\_M\_S 6006. Clinical Skills. 0.5 Credits.**

A hands -on laboratory class to provide experience with handling and examining Horses, Cattle, Small ruminants and Camelid species, Cats and Dogs for veterinary students. Prerequisite: first year veterinary students. Graded on S/U basis only.

**V\_M\_S 6010. Evaluated Veterinary Preceptorship. 1-99 Credit.**

This required co-op style course provides the student with practical exposure and experience in nonacademic veterinary medicine. Duration of 2-6 weeks. Prerequisite: VM-3 standing. Graded on S/U basis only.

**V\_M\_S 6020. Veterinary Radiology with Laboratory. 2 Credits.**

Introduces through lectures and demonstrations the principles of radiographic examination and interpretation of disease processes of domestic animals. Instructional period 8.

**V\_M\_S 6030. Veterinary Anesthesiology with Laboratory. 2 Credits.**  
Basic principles of anesthesiology for any species of domestic and exotic animals. Instructional period 9.

**V\_M\_S 6040. Companion Animal Medicine with Laboratory. 4 Credits.**  
Covers basic principles of veterinary internal medicine and selected subdisciplines. Instructional period 9.

**V\_M\_S 6050. Small Animal Medicine. 2.5 Credits.**  
Didactic presentations regarding pathophysiology, diagnosis and therapeutic management of organ system diseases in small animals. Instructional period 10.

**V\_M\_S 6060. Small Animal Surgery with Laboratory. 2 Credits.**  
Basic principles including suture materials and patterns; operative techniques, wound healing of soft tissue surgery. Instructional period 9.

**V\_M\_S 6071. Small Animal Surgery. 2 Credits.**  
Continuation of Veterinary Medicine and Surgery 6060 lectures, focusing primarily on orthopedics. Instructional period 10.

**V\_M\_S 6072. Conventional Surgery and Anesthesia Laboratory. 0.5 Credits.**  
Designed to teach entry-level surgical and anesthesia skills terminal procedures. Instructional period 10.

**V\_M\_S 6073. Fundamental Surgery and Anesthesia Laboratory. 0.5 Credits.**  
Designed to teach entry-level surgical and anesthesia skills using cadavers and survival spay and neuter procedures. This laboratory is offered as a substitute to Veterinary Medicine and Surgery 6072 for students with objections to participating in terminal procedure laboratories. Instructional period 11.

**V\_M\_S 6081. Food Animal Medicine and Surgery. 2.5 Credits.**  
Covers the important diseases of cattle, goats, sheep and swine. Recognition, management and prevention of diseases are stressed. Instructional period 10.

**V\_M\_S 6082. Food Animal Medicine and Surgery. 2 Credits.**  
Continuation of Veterinary Medicine and Surgery 6081. Covers the important diseases of cattle, goats, sheep and swine. Recognition, management and prevention of diseases are stressed. Instructional period 11.

**V\_M\_S 6090. Small Animal Emergency and Critical Care with Laboratory. 1 Credit.**  
Basic principles of emergency and critical care of companion animals. Instructional period 10.

**V\_M\_S 6110. Theriogenology. 3 Credits.**  
Fundamentals for reproductive function of domestic animals, medical and surgical management of diseases of reproductive systems. Instructional period 11.

**V\_M\_S 6120. Veterinary Ophthalmology. 1 Credit.**  
Covers examination, diagnostic procedures and treatment of important eye diseases of domestic animals. Instructional period 11.

**V\_M\_S 6130. Fundamentals of Veterinary Business Management. 1 Credit.**  
To realistically present to the second-year veterinary student a basic explanation of the essential need for strong base of knowledge pertaining to business and management in order to successfully operate a veterinary practice.

**V\_M\_S 6140. Nutrition with Laboratory. 1.5 Credit.**  
(same as Veterinary Medicine and Surgery 8421). Digestion, excretion, endocrinology, an reproduction.

**V\_M\_S 6151. Equine Medicine and Surgery. 2 Credits.**  
Covers the fundamentals of diseases of the equine species. Case Management approaches are utilized to provide examples of disease conditions. Instructional period 10.

**V\_M\_S 6152. Equine Medicine and Surgery. 1.5 Credit.**  
Continuation of Veterinary Medicine and Surgery 6151. Covers the fundamentals of diseases of the equine species. Case Management approaches are utilized to provide examples of disease conditions. Instructional period 11.

**V\_M\_S 6400. Food Animal Medicine and Surgery I. 6 Credits.**  
Technical, diagnostic and therapeutic procedures common to the practice of large animal medicine and surgery. Experience in the operation of a large animal hospital and farm outpatient practice. Six times per year.

**V\_M\_S 6411. Small Animal Internal Medicine. 1-99 Credit.**  
Clinical rotation in small animal internal medicine for veterinary degree students. Students will obtain history and conduct physical examination of client-owned dogs and cats. After reviewing findings with faculty, they will perform diagnostic tests and carry out treatments. Prerequisites: the entire pre-clinical curriculum of the CVM must be completed before taking this course; that is, students must have successfully completed the DVM curriculum through instructional period 12. Restricted to students in years 3 and 4 of the DVM curriculum. Graded on A/F basis only. May be repeated for credit.

**V\_M\_S 6412. Small Animal Community Practice. 1-99 Credit.**  
Clinical rotation in small animal general medicine and surgery for veterinary degree students. Students will obtain history and conduct physical examination of client-owned dogs and cats. After reviewing findings with faculty, they will perform diagnostic tests and carry out treatments. Prerequisites: the entire pre-clinical curriculum of the CVM must be completed before taking this course; students must have successfully completed the DVM curriculum through instructional period 12. Restricted to students in years 3 and 4 of the DVM curriculum. Graded on A/F basis only. May be repeated for credit.

**V\_M\_S 6420. Equine Medicine and Surgery I. 6 Credits.**  
Technical, diagnostic and therapeutic procedures common to equine practice. Emphasis on fundamental principles. Six times per year.

**V\_M\_S 6430. Small Animal Surgery I. 6 Credits.**  
Diagnostic procedures and surgical techniques applicable to companion animal surgery. Practical experience in the operation of a small animal surgical practice. Six times per year.

**V\_M\_S 6432. Small Animal Soft Tissue Surgery. 2 Credits.**  
Diagnostic procedures and surgical techniques applicable to companion animal soft tissue surgery. Practical experience in the operation of a small animal soft tissue surgical practice. Prerequisites: completion of year Vet Med 1 and 2. Graded on A/F basis only.

**V\_M\_S 6434. Small Animal Orthopedic Surgery. 2 Credits.**  
Diagnostic procedures and surgical techniques applicable to companion animal orthopedic surgery. Practical experience in the operation of a small animal orthopedic surgical practice. Prerequisites: completion of Veterinary Medicine years 1 and 2. Graded on A/F basis only.

**V\_M\_S 6436. Veterinary Neurology/Neurosurgery. 2 Credits.**  
A hands-on applied clinical rotation to provide experience in examination and diagnosis of domestic animals with neurologic disease. Prerequisites:

completion of preclinical curriculum of Veterinary Medicine years 1 and 2. Restricted to Third and Fourth year Veterinary Students.

**V\_M\_S 6441. Clinical Radiology I. 3 Credits.**

Fundamentals of radiology: indications for use, techniques, pathophysiologic alterations, interpretation of results, patient aftercare, protective measures against radiation hazards. Twelve times per year.

**V\_M\_S 6442. Clinical Anesthesiology I. 3 Credits.**

Required.

**V\_M\_S 6450. Theriogenology I. 2 Credits.**

Clinical rotation. Practical experience in reproductive techniques, obstetrics, breeding soundness and heard reproductive problems.

**V\_M\_S 6460. Clinical Ophthalmology I. 2 Credits.**

Practical application in problem solving and medical and surgical management of eye conditions of domestic animals. Eighteen times per year.

**V\_M\_S 6480. Cardiology. 2 Credits.**

Cardiology.

**V\_M\_S 6490. Small Animal Specialty Medicine I. 2 Credits.**

Clinical rotation in small animal oncology. Taught in the clinical setting using animals presented to the VMTH for evaluation and treatment of oncologic diseases. Eighteen times per year.

**V\_M\_S 6700. Food Animal Medicine and Surgery II Elective. 2-6 Credit.**

Prerequisite: V\_M\_S 6400.

**V\_M\_S 6710. Small Animal Medicine II Elective. 2-6 Credit.**

Continuation elective offered to 3rd- and 4th-year students. Opportunity for concentrated study and experience in medical areas. Enrollment subject to approval of course coordinator. Available to veterinarians under continuing education program. Prerequisite: V\_M\_S 6410.

**V\_M\_S 6711. Small Animal Internal Medicine Elective Clinical or Research Rotation. 2 Credits.**

Elective rotation in SAIM to focus on either clinical diagnostics and therapy, or research relevant to clinically important issues of pet animals. Prerequisite: Veterinary curriculum up until the clinical rotations; must be a 3rd or 4th year professional student in the CVM. May be repeated for credit. Graded on A/F basis only.

**V\_M\_S 6712. Private Practice Small Animal Internal Medicine Elective. 2 Credits.**

Improve critical thinking skills in disease diagnosis and management for internal medicine of dogs and cats. Clinical rotation off-site at Associated Veterinary Specialists. Teaching by cases seen by AVS clinician on duty. Student participation determined by supervising clinician. Prerequisite: all required VM I and VM II courses. VM III or VM IV standing required. Graded A-F only.

**V\_M\_S 6720. Equine Medicine and Surgery II Elective. 2-6 Credit.**

Continuation of Veterinary Medicine and Surgery 6420. Open to 3rd- and 4th year students, subject to approval of course coordinator. Opportunity for concentration in specific area of interest.

**V\_M\_S 6730. Small Animal Surgery II Elective. 3-6 Credit.**

Opportunity for concentration study and advanced surgical experience. Prerequisite: V\_M\_S 6430 or equivalent.

**V\_M\_S 6732. Small Animal Soft Tissue Surgery II Elective. 2 Credits.**

Opportunity for concentrated study and advanced soft tissue surgical experience. Prerequisites: Veterinary Medicine and Surgery [V\_M\_S] 6432 and completion of year Vet Med 1 and 2. Graded on A/F basis only.

**V\_M\_S 6734. Small Animal Orthopedic Surgery II Elective. 2 Credits.**

Opportunity for concentrated study and advanced orthopedic surgical experience. Prerequisites: completion of Veterinary Medicine years 1 and 2.

**V\_M\_S 6736. Veterinary Neurology/ Neurosurgery-Elective. 2 Credits.**

A hands-on applied clinical rotation to provide experience in examination and diagnosis of domestic animals with neurologic disease. Prerequisites: completion of preclinical curriculum of Veterinary Medicine years 1 and 2. Restricted to Third and Fourth year Veterinary Students.

**V\_M\_S 6741. Clinical Radiology II Elective. 1-99 Credit.**

Continuation of Veterinary Medicine and Surgery 6441.

**V\_M\_S 6742. Clinical Anesthesiology II Elective. 1-99 Credit.**

Continuation of Veterinary Medicine and Surgery 6442. This elective will focus on anesthetizing and monitoring the more challenging anesthetic cases during rotation. Required projects include a review paper on a relevant topic of choice, a written case report and assistance in research activities.

**V\_M\_S 6743. Radiology - Special Imaging Elective. 2-3 Credit.**

Introduction to special imaging modalities including ultrasound, computed tomography, magnetic resonance and nuclear scintigraphy with emphasis towards small animal patients. A major part of the course will be devoted to recognition and interpretation of abdominal ultrasound. Graded on A-F basis only. Prerequisite: V\_M\_S 6020; VM III and VM IV.

**V\_M\_S 6750. Theriogenology II Elective. 1-99 Credit.**

Continuation of Veterinary Medicine and Surgery 6450. Opportunity for concentrated study and experience. An elective, subject to approval of course coordinator and faculty member(s) who supervise student's work.

**V\_M\_S 6751. External Food Animal Service and Theriogenology Teaching Program. 1-99 Credit.**

The objective of this course is to offer veterinary students at MU additional options for clinical training in Theriogenology and Food Supply Veterinary Medicine beyond the core curriculum. Prerequisites: V\_M\_S 6081, 6082, 6110, 3rd or 4th year veterinary professional students. Graded on A/F basis only.

**V\_M\_S 6760. Small Animal Nutrition. 2 Credits.**

Elective clinical rotation designed to allow students to gain hands-on experience with canine and feline nutrition. Prerequisite: Veterinary Medicine and Surgery [V\_M\_S] 6140. Restricted to VM-III or VM-IV students.

**V\_M\_S 6770. Herd Health Management and Nutrition II Elective. 2-6 Credit.**

Concentrated study/experience in feed lot, dairy, cow/calf swine herd agribusiness enterprises applicable to veterinary practice. Prerequisites: V\_M\_S 6400 and VM-4 status.

**V\_M\_S 6800. Clinical Ophthalmology II Elective. 1-99 Credit.**

Elective offered to 3rd and 4th year veterinary students. Opportunity for concentrated study and experience in small animal emergency and critical care.

**V\_M\_S 6810. Cardiology II Elective. 1-99 Credit.**

Cardiology II Elective.



**V\_M\_S 6820. Small Animal Emergency and Critical Care. 1-99 Credit.**  
Elective offered to 3rd and 4th year veterinary students. Opportunity for concentrated study and experience in small animal emergency and critical care.

**V\_M\_S 6821. Small Animal Emergency Critical Care Elective. 2 Credits.**

Clinical elective rotation providing focused experience in case management and issues pertinent to small animal emergency and critical care. Prerequisites: levels VMS 3 or 4. Graded on A/F basis only. May be repeated for credit.

**V\_M\_S 6830. Food Animal Production Medicine. 1-99 Credit.**

This 8-week rotation will focus on the reproductive, metabolic and immunologic physiology of beef, dairy and swine with additional emphasis on the spreadsheet and data base applications.

**V\_M\_S 6850. Clinical Oncology. 1-99 Credit.**

Student performance will be assessed 70% subjective based on clinical performance and 30% objectively based on a paper and presentation. Students will examine, diagnose, and treat animals presenting to the oncology services. Cytology, biopsy, bone marrow aspirate, and chemotherapy administration are among the procedures that will be routinely performed. Formal cytology rounds are held once weekly with clinical pathologists. Students will be expected to become familiar with the clinical application of radiation therapy and chemotherapy. The students will be involved with ongoing clinical trials and will be expected to understand the mechanics of a clinical trial.

**V\_M\_S 6986. Advanced Clinical Neurology and Neurosurgery. 1 Credit.**

This is a supplement to neurology taught in the small animal course to improve preparedness for clinical practice. Topics include neurolocalization techniques, electrodiagnostic and CT/MR interpretation, wider exposure to differential diagnosis, and neurosurgical principals. Prerequisite: Passing grade in Veterinary Medicine and Surgery [V\_M\_S] 6040.

**V\_M\_S 6987. Problem-Based Learning Clinic Preparation. 1 Credit.**

This course is designed to prepare the VMIII student about to enter clinics for a systematic approach to a clinical case. Emphasis will be placed on developing focused problem and differential lists, and logical choices of diagnostic tests. Prerequisite: VMIII level. Graded on S/U basis only.

**V\_M\_S 6988. Small Animal Clinical Nutrition. 1 Credit.**

**V\_M\_S 6989. Advanced Oncology of Animals. 1 Credit.**  
Advanced Oncology of Animals.

**V\_M\_S 6990. Zoological Medicine. 2 Credits.**

Interested students of Zoological Medicine would significantly broaden their understanding of this discipline and increase the likelihood they could enter zoological veterinary practice or a zoological veterinary medical residency. Graded on A/F basis only.

**V\_M\_S 6991. Advanced Equine Lameness with Laboratory. 1 Credit.**  
Advanced Equine Lameness with Laboratory.

**V\_M\_S 6992. Small Animal Endoscopy. 1 Credit.**  
Small Animal Endoscopy.

**V\_M\_S 6993. Advanced Veterinary Anesthesia. 1 Credit.**  
Advanced Veterinary Anesthesia.

**V\_M\_S 6994. Advanced Techniques in Small Animal Surgery with Laboratory. 1 Credit.**

Advanced Techniques in Small Animal Surgery with L.

**V\_M\_S 6995. Clinical Cardiology. 1 Credit.**

Clinical Cardiology.

**V\_M\_S 6996. Advanced Dermatology. 1 Credit.**

Purpose to broaden appreciation of dermatology in animals. Instructional Period 11. Graded on A/F basis only.

**V\_M\_S 6997. Food Animal Diagnostic Exercises. 1 Credit.**

Clinical Block 3 (August to October).

**V\_M\_S 6998. Small Animal Behavioral Medicine. 1 Credit.**

Small Animal Behavioral Medicine.

**V\_M\_S 6999. Food Animal Surgery Laboratory. 1 Credit.**

Food Animal Surgery Laboratory.

**V\_M\_S 7301. Topics in Veterinary Medicine and Surgery. 1-99 Credit.**

Organized study of select topics. Prerequisites: junior standing and instructor's consent.

**V\_M\_S 7303. Advanced Topics in Veterinary Anesthesia. 1 Credit.**

(same as Veterinary Medicine and Surgery [V\_M\_S] 6993).

**V\_M\_S 7304. Advanced Equine Surgery. 2 Credits.**

The purpose of the course is to aid in the preparation of the resident for Board certification in the American College of Veterinary Surgeons. Prerequisites include a DVM or equivalent degree, acceptance to the graduate school, acceptance to the residency program, and instructor approval.

**V\_M\_S 7328. Introductory Radiation Biology. 3 Credits.**

(same as Radiology [RADIOL], Nuclear Engineering [NU\_ENG], and Biological Sciences [BIO\_SC] 7328). Prerequisite: junior standing Sciences/Engineering; one course in biological sciences and physics/chemistry; or instructor's consent.

**V\_M\_S 7351. Advanced Surgical Techniques. 1-99 Credit.**

Special application to large, small animals. Prerequisite: D.V.M.

**V\_M\_S 7355. Advanced Techniques in Radiology. 1-99 Credit.**

Special application to domestic animals. Prerequisite: D.V.M.

**V\_M\_S 7370. Orthopaedic Biomechanics. 3 Credits.**

(same as Biological Engineering [BIOL\_EN] 7370). Engineering sciences will be leverage to create a comprehensive study of orthopaedic biomechanics. The tissue mechanics of bone and soft tissue will be studied along with applying structural analysis of the musculoskeletal system. Prerequisites: Engineering [ENGINR] 1200, BIOL\_EN 3170; graduate standing; departmental consent. Graded on A/F basis only.

**V\_M\_S 7385. Problems in Veterinary Medicine and Surgery. 1-99 Credit.**

Studies in specific areas of veterinary medicine and surgery.

**V\_M\_S 8021. Neurology Journal Review. 1 Credit.**

Weekly journal review and seminar on current topics in veterinary neurology, related clinical disciplines and basic neurosciences. Prerequisites: DVM degree. Graded on S/U basis only.

**V\_M\_S 8022. Internal Medicine Clinicopathologic Conference. 1 Credit.**

Graded on S/U basis only.

**V\_M\_S 8023. Internal Medicine Journal Review. 1 Credit.**

Graded on S/U basis only.

**V\_M\_S 8024. Medicine-Surgery-Pathology Conference. 1 Credit.**  
Graded on S/U basis only.

**V\_M\_S 8025. Equine Medicine Journal Review. 1 Credit.**  
Graded on S/U basis only.

**V\_M\_S 8026. Surgery Journal Review. 1 Credit.**  
Graded on S/U basis only.

**V\_M\_S 8027. Food Animal Medicine Journal Review. 1 Credit.**  
Graded on S/U basis only.

**V\_M\_S 8028. Cardiovascular Medicine Journal Review. 1 Credit.**  
Cardiovascular Medicine Journal Review. Graded on S/U basis only.

**V\_M\_S 8029. Emergency and Critical Care Journal Review. 1 Credit.**  
This course will concentrate on review of emergency and critical care literature. Prerequisite: DVM degree. Graded on S/U basis only.

**V\_M\_S 8030. Seminars in Vet. Med. & Surgery: Ophthalmology Pathology Seminar. 1 Credit.**  
Review of clinical cases presented in two formats: histopathology slides and kodachrome slides. Prerequisite: DVM degree or equivalent and acceptance into an ophthalmology residency program. Graded on S/U basis only.

**V\_M\_S 8031. Sem. in Vet. Med & Surgery: Ophthalmology Seminar & Journal Review. 1 Credit.**  
Weekly journal review and seminar on current topics in veterinary ophthalmology, review of pertinent literature in human ophthalmology, and review of ophthalmic texts. Prerequisite: DVM or equivalent degree and acceptance into the ophthalmology residency program. Graded on S/U basis only.

**V\_M\_S 8032. Seminars in Veterinary Anesthesiology. 1 Credit.**  
A journal review will focus on advances in veterinary anesthesiology, pharmacology, and physiology. Prerequisites: DVM and graduate school enrollment or instructor's consent. Graded on S/U basis only.

**V\_M\_S 8033. Seminars in Clinical Sciences-Equine Surgery Journal Review. 1 Credit.**  
Journal review will focus on advances in equine surgery and will consist of a review of recent manuscripts pertaining to equine surgery in current journals and review of pertinent book chapters. Graded on S/U basis only. Prerequisite: DVM degree and instructor's consent.

**V\_M\_S 8034. Seminars in Veterinary Radiology. 1 Credit.**  
This journal review will focus on advances in veterinary radiology, ultrasound and alternate imaging. Current and past literature will be reviewed weekly and will be chosen by the class coordinator. Prerequisites: DVM and graduate school enrollment or instructor's consent. Graded on S/U basis only.

**V\_M\_S 8035. Current Topics in Veterinary Clinical Nutrition. 1 Credit.**  
Review and critical analysis of recently published articles in veterinary nutrition and discussion of aspects relevant to clinical application and management of veterinary patients. Restricted to Graduate Veterinary Medicine majors or instructor's consent. Can be repeated for a total of six credit hours. Graded on a S/U basis only.

**V\_M\_S 8036. Advanced Physiology of the Dog and Cat. 2 Credits.**  
To understand advanced medical physiology: cell physiology, muscle function, cardiac and circulatory physiology, renal function, distribution of fluid in the body, functions of red and white blood cells, mechanisms of hemostasis, resistance to infection and pulmonary physiology. Instructor consent required. Graded on A/F basis only.

**V\_M\_S 8040. Advanced Small Animal Clinical Nutrition. 2 Credits.**  
Advanced study of veterinary clinical nutrition in the dog and cat. Includes review of applied biochemistry, nutrients, and feeding principles along with pathophysiology and nutritional management of common diseases. Prerequisite: Introductory Veterinary Nutrition; graduate standing. May be repeated for credit. Graded on A/F basis only.

**V\_M\_S 8090. Research in Veterinary Medicine and Surgery (Thesis). 1-99 Credit.**  
Open to graduate students with requisite preparation. Graded on a S/U basis only.

**V\_M\_S 8400. Clinical Veterinary Regulatory Medicine and Public Health. 2 Credits.**  
(same as Public Health [P\_HLTH] 8400). The goal of this course is to familiarize the student with clinical aspects of veterinary public health/regulatory medicine. Must be enrolled in MPH (veterinary public health concentration) or DVM curriculum.

**V\_M\_S 8401. Topics in Veterinary Clinical Sciences. 1-3 Credit.**  
Current topics, infrequently-taught courses, or new courses not yet designated by a permanent course number. Some sections may be graded A/F only or S/U only.

**V\_M\_S 8402. Seminar in Veterinary Clinical Sciences. 1 Credit.**  
Graduate seminars and conferences with a focus on current literature within a specialty area. Graded on S/U basis only.

**V\_M\_S 8405. Comparative Respiratory Pathophysiology. 1 Credit.**  
A consideration of clinical pathophysiology of the respiratory system relative to diseases of the thorax and clinical anesthesiology.

**V\_M\_S 8406. Topics in Veterinary Medicine and Surgery. 2 Credits.**  
Principles of canine long bone development and deformity corrections. Prerequisites: must be a DVM or be enrolled in the Veterinary curriculum; instructor's consent.

**V\_M\_S 8410. Veterinary Medicine and Surgery Research Seminar. 1 Credit.**  
Current research in veterinary medicine and surgery. Literature reviews and presentation or original graduate student research. Graded on S/U basis only.

**V\_M\_S 8411. Clinical Veterinary Endocrinology. 2 Credits.**  
A 2-hour course for post-DMV graduate students. It will focus on clinically relevant physiology, pathophysiology, and diagnostic evaluation of hormone systems. Prerequisite: graduate standing.

**V\_M\_S 8413. Equine Internal Medicine. 2 Credits.**  
Prerequisite: DVM degree or equivalent.

**V\_M\_S 8415. Advanced Veterinary Neurology. 2 Credits.**  
Basic neuroscience as it relates to clinical neurology and the pathophysiology of diseases of the brain, spinal cord, peripheral nerve and muscle in domestic animals. Prerequisites: DVM degree. Graded on A/F basis only.

**V\_M\_S 8416. Advanced Veterinary Internal Medicine: Cardiovascular Medicine. 3 Credits.**  
Pathologic, pathophysiologic, hemodynamic and pharmacological mechanisms of important to the diagnosis, assessment, management and research of cardiovascular diseases of animals. Prerequisite: graduate standing.

**V\_M\_S 8417. Advanced Veterinary Internal Medicine - Clinical Oncology. 2 Credits.**

Provides graduate students in the clinical and basic sciences alike with a working knowledge of the biological mechanisms of cancer development and progression and the related approaches to cancer prevention and therapy. It is assumed that students will have a strong background in biology as a foundation for discussion. Prerequisite: graduate standing DVM or equivalent degree recommended.

**V\_M\_S 8418. Advanced Veterinary Internal Medicine: Food Animal Medicine. 2 Credits.**

Current concepts in the pathophysiology, diagnosis and management of medical disorders, diseases of the limbs, and infectious diseases of cattle and food producing animals.

**V\_M\_S 8419. Advanced Topics in Cancer Biology and Clinical Oncology. 2 Credits.**

This course will provide students with a knowledge base in cancer cell biology that may be applied to the practice of clinical oncology. Monthly clinically-oriented seminars by invited speakers will be preceded by a weekly in-depth review of the basic science related to the seminar topic. Graduate standing required, MD or DVM recommended.

**V\_M\_S 8421. Advanced Veterinary Surgery: Small Animal Surgery. 2-4 Credit.**

Current concepts in the pathophysiology, diagnosis and management of surgical disease of the dog and the cat. Includes laboratories of advanced surgical techniques.

**V\_M\_S 8423. Comparative Arthrology. 3 Credits.**

Lectures and discussion covering anatomy, physiology, biomechanics, pathophysiology, and clinical aspects of mammalian diarthrodial joints.

**V\_M\_S 8425. Advanced Veterinary Surgery: Equine Surgery. 2-4 Credit.**

Current concepts in the pathophysiology, diagnosis and management of surgical disorders of the horse. Taught yearly as sections A, B, C. Repeatable to a maximum of 10 credit hours (individual sections may be taken once).

**V\_M\_S 8426. Advanced Veterinary Surgery - Ophthalmic Surgery. 2-4 Credit.**

Surgery labs consisting of 2-4 hours of surgical instruction per week. Prerequisite: DVM or equivalent degree and acceptance into the ophthalmology residency program. Graded on A/F basis only.

**V\_M\_S 8431. Research Methods and Data Analysis. 2-4 Credit.**

A consideration of research methods, data analysis, and practical approaches to analyzing data sets derived from veterinary and biomedical studies.

**V\_M\_S 8435. Veterinary Clinical Sciences: Clinical Immunology. 2 Credits.**

Advanced concepts in veterinary immunology and immunopathology.

**V\_M\_S 8436. Veterinary Clinical Sciences: Clinical Pharmacology. 1 Credit.**

Advanced concepts in veterinary clinical pharmacology, pharmacokinetics, and anesthesiology.

**V\_M\_S 8437. Advanced Topics in Veterinary Medicine (Nuclear Medicine). 1 Credit.**

An in-depth review of veterinary nuclear medicine. Includes the physics of nuclear medicine, common imaging techniques, common radiopharmaceuticals, radiopharmaceutical kinetic evaluation and some common physiological applications. Prerequisite: graduate standing.

**V\_M\_S 8439. Advanced Veterinary Ultrasonography. 2-3 Credit.**

Advanced concepts in veterinary ultrasonography; including ultrasound and Doppler physics, instrumentation, examination methodology, and interpretation of studies.

**V\_M\_S 8440. Adv Veterinary Clinical Sciences: Advanced Clinical Ophthalmology. 1-3 Credit.**

Case-based discussion course. Prerequisite: DVM or equivalent degree and acceptance into the ophthalmology residency program. Graded on A/F basis only.

**V\_M\_S 8445. Veterinary Critical Care and Emergency Medicine. 2-3 Credit.**

Advanced study of veterinary critical care and emergency medicine and surgery focusing on current research and literature as well as clinical application.

**V\_M\_S 8450. Research in Veterinary Medicine and Surgery (non-thesis). 1-99 Credit.**

Open to graduate students with requisite preparation.

**V\_M\_S 8485. Problems in Veterinary Clinical Sciences. 1-3 Credit.**

Supervised individuals studies arranged with a faculty member and approved by the advisory committee. Some sections may be graded A/F only or S/U only.

**V\_M\_S 8487. Nuclear Medicine. 3 Credits.**

Principles of radiation detection instrumentation, monitoring radiological safety and diagnostic procedures used on veterinary nuclear medicine. Prerequisites: one year College Physics, D.V.M. degree, and departmental consent.

**V\_M\_S 8488. Radiation Therapy. 3 Credits.**

Prerequisite: one year College Physics, D.V.M. degree, and departmental consent.

**V\_M\_S 8489. Veterinary Radiographic Physics. 1 Credit.**

This class will review in depth the fundamental principles of radiographic physics, with an emphasis on preparation for the American College of Veterinary Radiology board examination. Prerequisites: DVM and graduate school enrollment or instructor's consent. Graded on an S/U basis only.

**V\_M\_S 9090. Research in Veterinary Medicine and Surgery. 1-99 Credit.**

Research in Veterinary Medicine and Surgery. Graded on S/U basis only.

## **Veterinary Pathobiology (V\_PBIO)**

**V\_PBIO 5511. Veterinary Immunology. 1.5 Credit.**

(same as Veterinary Pathobiology 8451). Basic immunology techniques. Topics include innate and adaptive immunity, development of the immune system, induction and expression of the immune response, structure and function of antibodies, antigen-antibody reactions, the major histocompatibility complex, aspects of immunology in disease.

**V\_PBIO 5512. Veterinary Immunology. 1.5 Credit.**

(same as Veterinary Pathobiology 8451). Continuation of Veterinary Pathobiology 5511.

**V\_PBIO 5552. Veterinary Bacteriology with Laboratory. 3 Credits.**

Classification and properties of pathogenic bacteria and fungi of animals; relationship to public health; considers pathogenesis, immunology of

infection. Prerequisite: enrollment in the College of Veterinary Medicine. Instructional period 5.

**V\_PBio 5553. Veterinary Bacteriology II. 2.5 Credits.**

Continuation of Veterinary Pathobiology 5552. Instructional period 6.

**V\_PBio 5554. Veterinary Virology. 2.5 Credits.**

(same as Veterinary Pathobiology 8454). Classification and properties of viruses. Considers the etiologic, pathologic and immunologic aspects of viral diseases of animals. Prerequisite: enrollment in the College of Veterinary Medicine. Instructional periods 6 and 7.

**V\_PBio 5555. Epidemiology and Biostatistics with Laboratory. 2 Credits.**

(same as Veterinary Pathobiology 8455). This course introduces students to methods of determining the influence of disease on populations and how this information is applied to individual animals. Biostatistics and evidence based medicine are also discussed in this course. The knowledge gained in this course is applied to reading professional literature during the course. Instructional period 4.

**V\_PBio 5557. Veterinary Parasitology with Laboratory. 3 Credits.**

(same as Veterinary Pathobiology 8457). Parasites and parasitic diseases of ruminants, horses, swine, dogs, cats, poultry and other animals. Includes classification, morphology, and bionomics of protozoa, helminths, and arthropods. Instructional period 6.

**V\_PBio 5558. Veterinary Public Health. 2 Credits.**

(same as Veterinary Pathobiology 8458). In this course students are introduced to the wide range of veterinary involvement in maintaining and assuring human health, nationally and globally. Topics discussed include: agencies such as USDA, FDA, CDC, food safety and meat inspection, veterinary responsibility in identifying diseases, legal issues of drug use, and zoonotic diseases. Instructional period 7.

**V\_PBio 5575. Veterinary Pathology with Laboratory. 3 Credits.**

General Pathology. Tissue reactions to various disease agents in domestic animals. Instructional period 5.

**V\_PBio 5576. Veterinary Systemic and Special Pathology with Laboratories. 3 Credits.**

Special and systemic pathology. Tissue reactions to disease in special systems in domestic animals. Instructional period 6.

**V\_PBio 5577. Veterinary Systemic and Special Pathology II with. 3 Credits.**

Follows the general pathology and continues the systemic pathology taught in Veterinary Pathobiology 5576. The course, consisting of daily lectures and weekly laboratories, covers disease, mainly in domestic animals, of the following systems or organs: cardiovascular, respiratory, lymphoid, cutaneous, mammary, ophthalmic, and otic. Instructional period 7.

**V\_PBio 5578. Veterinary Clinical Pathology with Laboratory. 3 Credits.**

Physiologic basis, interpretation and clinical application of laboratory assays in hematology, chemistry, cytology, and urinalysis, utilization of laboratory methods to define pathological states and to diagnose disorders of domestic animals. Prerequisite: enrollment in College of Veterinary Medicine, instructional period 8.

**V\_PBio 5579. Veterinary Genomics. 1 Credit.**

Study of genomes, an organism's entire set of the genetic information. Used for detection of pathogen genomes, and markers for mutation causing inherited disease. Instructional period 5.

**V\_PBio 5580. Introduction to Veterinary Informatics with Laboratory. 1 Credit.**

Introduces concepts of veterinary informatics and development of core informatics competencies necessary for successful veterinary practice. The knowledge and skills in this course address topics such as data retrieval, information evaluation, medical records, practice management, communication skills and telemedicine. Instructional period 5.

**V\_PBio 5601. Animals in Emergencies & Basic Emergency Response Training for Vet Students. 1 Credit.**

This course will enable veterinary and graduate students to understand their role in society during disasters and credential as responders. Students must be enrolled in the College of Veterinary Medicine and pursuing a DVM degree or be a student pursuing an MPH degree. Instructor consent required for non-veterinary graduate students seeking MPH degrees. Graded on A/F basis only.

**V\_PBio 5991. Introduction to Avian Medicine. 1 Credit.**

Introduction to Avian Medicine.

**V\_PBio 5995. Foundations in Veterinary Research and Discovery. 2 Credits.**

This course will introduce veterinary students to concepts of research including hypothesis development, experimental design, data interpretation, grantsmanship, responsible conduct of research, biomedical research careers and presentation and publication methods.

**V\_PBio 6010. Laboratory Animal Medicine. 1.5 Credit.**

Principles of Veterinary Medicine applied to laboratory animals as pets and in research. Husbandry, handling and clinical techniques, diseases, and use as disease models are discussed. Instructional period 8.

**V\_PBio 6647. Diagnostic Pathology and Special Species Medicine. 8 Credits.**

Application of laboratory techniques used to diagnose disease by macroscopic, microscopic, biochemical, microbiologic, and toxicologic findings. Case method of teaching. Domestic avian species and laboratory animals included. Six times yearly.

**V\_PBio 6676. Laboratory Animal Medicine and Management Elective. 2-6 Credit.**

Elective offered 3rd- and 4th-year students, subject to approval of course coordinator and supervising faculty. Concentrated study/experience in laboratory animal disease(s)/colony management. Available to veterinarians as a continuing education program.

**V\_PBio 6678. Epidemiology and Community Health. 2-6 Credit.**

Elective covering advanced aspects of epidemiology and community health. Emphasizes problem solving and is designed to meet needs of the individual student. Prerequisite: V\_PBio 5558 or instructor's consent. Instructional period arranged.

**V\_PBio 6679. Diagnostic Pathology and Special Species Medicine. 3-6 Credit.**

Third- and fourth-year students. Elective. Approval of coordinator and supervisory staff. Continuation of Veterinary Pathobiology [V\_PBio] 6647 with more depth. Available to D.V.M.'s as part of continuing education program.

**V\_PBio 6684. Research Techniques in Veterinary Pathobiology. 1-6 Credit.**

Research Techniques in Veterinary Pathobiology.

**V\_PBIO 8090. Thesis Research in Veterinary Pathobiology. 1-99 Credit.**

Open to graduate students with requisite preparation. Research on specific animal diseases, prevention and treatment. Graded on a S/U basis only.

**V\_PBIO 8401. Topics in Veterinary Pathobiology. 1-99 Credit.**

Courses with lectures in various topics in veterinary pathobiology will be given on a trial basis, depending on faculty expertise and student demand. Credit hours are usually 1 or 3. Specialized topics will be covered. Prerequisite: instructor's consent.

**V\_PBIO 8410. Seminar in Veterinary Pathobiology. 1 Credit.**

Discussion of current research methods in veterinary pathobiology.

**V\_PBIO 8411. Seminar in Histopathology. 1 Credit.**

Discussion of current research and/or case studies in pathology of diseases of domestic animals, laboratory animals and avian species. Team taught.

**V\_PBIO 8421. Advanced Epidemiology. 3 Credits.**

(same as Family and Community Medicine [F\_C\_MD] 8421).

**V\_PBIO 8430. Comparative Pathology. 3 Credits.**

Biochemical and morphologic lesions related to the mechanism of disease expression in plants and animals.

**V\_PBIO 8431. Research Methods and Data Analysis. 2-4 Credit.**

Specific assignments on diagnostic methods including surgical pathology, necropsies, toxicology. Prerequisite: departmental consent.

**V\_PBIO 8432. Advanced Histopathology. 5 Credits.**

Advanced microscopic study of pathological tissues. Prerequisite: departmental consent.

**V\_PBIO 8433. Veterinary Oncology. 2 Credits.**

History and molecular biology of neoplasia; laboratory for discussion of practical aspects of diagnosis.

**V\_PBIO 8434. Advanced Clinical Pathology. 3 Credits.**

Lecture/tutorial teaching; pathogenesis of clinical laboratory abnormalities in the common domesticated species. Emphasis is placed on mechanisms of disease and pathophysiology of the changes seen in each organ system. Pre-requisite: departmental consent.

**V\_PBIO 8435. Advanced Microscopy in Veterinary Clinical Pathology. 1 Credit.**

Recognition and pathogenesis of abnormalities found via microscopic analysis of blood smears or cytology. Prerequisite: Veterinary Pathobiology [V\_PBIO] 5578 departmental consent.; DVM or current enrollment in veterinary curriculum.

**V\_PBIO 8436. Pathogenic Mechanisms in Veterinary Pathobiology. 3 Credits.**

This course will include disease mechanisms, described at the cellular and molecular level, which result in tissue morphologic (gross and microscopic) and clinical abnormalities. Examples of discussion topics include soluble mediators of inflammatory processes, host-agent interactions, and host defense mechanisms. Prerequisite: instructor's consent.

**V\_PBIO 8437. Pathology of Laboratory Animals. 4 Credits.**

Gross and microscopic study of spontaneous and naturally occurring diseases in laboratory animals. Prerequisite: departmental consent.

**V\_PBIO 8438. Primatology. 3 Credits.**

Disease and pathology of primates.

**V\_PBIO 8441. Topics in Veterinary Pathobiology. 1-3 Credit.**

Subjects appropriate to veterinary pathobiology and/or epidemiology, taught on a one-time basis or infrequently. May include highly specialized topics. Specific course must be approved by departmental faculty.

**V\_PBIO 8442. Advanced Veterinary Pathogenic Bacteriology. 3 Credits.**

Study of pathogenic bacteria causing animal disease. Pathogenic mechanisms and host-parasite relationships are emphasized. Laboratory procedures for isolation and identification of pathogens are included.

**V\_PBIO 8443. Viral Infection and Immunity. 3 Credits.**

Study of virus infection at the level of the intact animal. Includes immunology of domestic animal species. Prerequisites: graduate standing and instructor's consent.

**V\_PBIO 8445. Advanced Veterinary Parasitology. 3 Credits.**

Parasitic diseases of domestic and exotic animals and those of public health significance. Prerequisites: one course in general parasitology and graduate standing.

**V\_PBIO 8446. Advanced Immunology and Immunopathology. 3 Credits.**

Study of the immune system at the level of the intact animal. Includes a discussion of immunity-infectious diseases. Prerequisites: Molecular Microbiology and Immunology [MICROB] 4304, graduate standing and instructor's consent.

**V\_PBIO 8447. Oncogenic Animal Viruses. 3 Credits.**

Biology of RNA- and DNA-containing animal tumor viruses and their in vitro and in vivo interactions with host cells.

**V\_PBIO 8448. Molecular Methods in Nucleic Acids. 3 Credits.**

The course will focus on the most recent developments in technology related to eukaryotic and prokaryotic molecular biology and as analysis a manipulation of nucleic acids and their application to define structure, function and biosynthesis of macromolecules. Prerequisites: instructor's consent.

**V\_PBIO 8450. Non-Thesis Research in Veterinary Pathobiology. 1-99 Credit.**

Research not expected to terminate in dissertation.

**V\_PBIO 8451. Introduction to Immunology. 3 Credits.**

(same as Veterinary Pathobiology [V\_PBIO] 5511 and 5512). fundamentals of immunology as applied to domestic animals.

**V\_PBIO 8452. Cell and Molecular Electron Microscopy. 4 Credits.**

Lecture class that describes the use of electron microscopy (transmission and scanning) in biomedical research. Students receive hands-on experience by completing a laboratory project.

**V\_PBIO 8454. Domestic Animal Virology. 2 Credits.**

(same as Veterinary Pathobiology [V\_PBIO] 5554).

**V\_PBIO 8455. Epidemiology and Biostatistics. 2 Credits.**

(same as Veterinary Pathobiology [V\_PBIO] 5555).

**V\_PBIO 8457. Animal Parasitology. 3-5 Credit.**

(same as Veterinary Pathobiology [V\_PBIO] 5557).

**V\_PBIO 8458. Veterinary Public Health. 2 Credits.**

(same as Veterinary Pathobiology [V\_PBIO] 5558).

**V\_PBIO 8468. Laboratory Animal Biology. 4 Credits.**

Taxonomy, anatomy, physiology, nutrition and behavior of laboratory animals including non-human primates and less common species are

covered. Genetics, gnostobiology, housing and production are also presented. Prerequisite: instructor's consent.

**V\_PBio 8552. Veterinary Pathogenic Bacteriology and Mycology I. 3 Credits.**

This course deals with the bacterial pathogens of animals emphasizing the pathogenesis and pathology of the diseases, diagnostic problems, appropriate treatments and prevention measures. Graduate standing required, Consent of instructor required. Course graded A/F only.

**V\_PBio 8553. Veterinary Pathogenic Bacteriology and Mycology II. 2.5 Credits.**

This course deals with the bacterial pathogens of animals emphasizing the pathogenesis and pathology of the diseases, diagnostic procedures, appropriate treatments and prevention measures. Graduate standing required, Consent of instructor required. Prerequisites: Veterinary Pathobiology [V\_PBio] 5552 or 8552. Graded on A/F basis only.

**V\_PBio 8601. Animals in Emergencies & Basic Emergency Response Training for Vet Students. 1 Credit.**

This course will enable veterinary and graduate students to understand their role in society during disasters and credential as responders. Students must be enrolled in the College of Veterinary Medicine and pursuing a DVM degree or be a student pursuing an MPH degree. Instructor consent required for non-veterinary graduate students seeking MPH degrees. Graded on A/F basis only.

**V\_PBio 8641. Introduction to Research Ethics. 1 Credit.**

This course provides students with a brief overview of many of the ethical issues that confront today's scientist. It is important that scientist think about and develop their abilities to make well-reasoned responses to ethical problems.

**V\_PBio 9090. Area Veterinary Pathobiology Dissertation Research. 1-99 Credit.**

Dissertation Research for PhD students. Prerequisite: departmental consent. May be repeated for credit. Graded on S/U basis only.

## Women's and Gender Studies (WGST)

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**WGST 1001. Topics in Women's and Gender Studies-General. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing.

**WGST 1003. Topics in Women's and Gender Studies-Behavioral. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing.

**WGST 1004. Topics in Women's and Gender Studies-Social Science. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing.

**WGST 1005. Topics in Women's and Gender Studies-Humanities. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing.

**WGST 1120. Bodies, Cultures, and Nations. 3 Credits.**

Introduction to the basic issues of Western feminist thought through a study of classical and contemporary sources. Course will consider images, conditions, activities and visions of women as they vary historically and socially.

**WGST 1360. The Female Experience: Body, Identity, and Culture. 3 Credits.**

(same as Sociology [SOCIO] 1360). Study of the experience of being female in American Culture. Course will focus on development of women's identities through such topics as: sexuality, reproduction, self-image, rape and health care.

**WGST 1500. The Black Woman in America. 3 Credits.**

(same as Black Studies [BL\_STU] 1500). Review and critique of a variety of materials about Black women from slavery to the social and philosophical impact of the Black woman's struggle on all women. Prerequisites: sophomore standing.

**WGST 2001. Topics in Women's and Gender Studies-General. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 2003. Topics in Women's and Gender Studies-Behavioral. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 2004. Topics in Women's and Gender Studies-Social Science. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 2005. Topics in Women's and Gender Studies-Humanities. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 2005H. Topics in Women's and Gender Studies-Humanities - Honors. 1-3 Credit.**

Organized study of selected topics in women's and gender studies. Subjects and earnable credit may vary from semester to semester. Repeatable up to 6 hours. Prerequisite: sophomore standing and/or Women's and Gender Studies [WGST] 1120. Honors eligibility required.

**WGST 2010. Gender and Identity: Understanding Intersectionality. 3 Credits.**

Explores historical and contemporary dimensions of social inequality in gender, race, class and sexuality. Uses an interdisciplinary lens and feminist analysis to analyze social, cultural, political and economic

experiences of individuals and communities: Prerequisite: Women's and Gender Studies [WGST] 1120; sophomore standing.

**WGST 2020. Feminist Theory I. 3 Credits.**

Introduces central themes and problems in feminist thought, including consciousness-raising, motherhood, class, race, sexuality, nationalism, and transnational feminism. Prerequisite: Women's and Gender Studies [WGST] 1120 or sophomore standing.

**WGST 2030. Gender Perspectives: Colonial Histories, Post-Colonial Challenges. 3 Credits.**

Identifies and interrogates key gender issues in post-colonial countries with an acute awareness of their constructions through western and local knowledges, patriarchy, the nation-state, and globalization. Prerequisite: sophomore standing. May be repeated for credit with different semester themes.

**WGST 2040. Perspectives on Women's Empowerment. 3 Credits.**

Women's Empowerment is a popular catch phrase in politics and research, but what does it mean? Governments and NGOs attempt to define and measure it. Yet these definitions often do not address the routes to women's empowerment in First World and Third World contexts.

**WGST 2050. Gender Perspectives: Issues in Public Health. 3 Credits.**

Addresses issues of gender and public health in the US and abroad. Considers how race, class, gender, sexuality, and geopolitical context may impact health. May focus on specific health issues. May be repeated for credit with different semester themes.

**WGST 2080. Perspectives on Sexual and Gender Diversity. 3 Credits.**

This interdisciplinary, cross-cultural course investigates modern constructions of sexed and gendered bodies, paying particular attention to those systems of gender-based oppression that suppress multiple gender identities and expressions. Prerequisite: sophomore standing. May be repeated for credit with different semester themes.

**WGST 2180. Introduction to Women's Literature. 3 Credits.**

(same as English [ENGLISH] 2180). A study of traditional and non-traditional literature written by women from the perspective of feminist themes-love, power, work, family and other relations. Prerequisite: ENGLISH 1000. No more than six hours may be taken in the Introduction to Women's Literature series.

**WGST 2186. Introduction to Women's Literature, Beginning to 1603. 3 Credits.**

(same as English [ENGLISH] 2186). See Women's and Gender Studies [WGST] 2180 for course description.

**WGST 2187. Introduction to Women's Literature, 1603 to 1789. 3 Credits.**

(same as English [ENGLISH] 2187). See Women's and Gender Studies [WGST] 2180 for course description.

**WGST 2188. Introduction to Women's Literature, 1789 to 1890. 3 Credits.**

(same as English [ENGLISH] 2188). See Women's and Gender Studies [WGST] 2180 for course description.

**WGST 2189. Introduction to Women's Literature, 1890 to Present. 3 Credits.**

(same as English [ENGLISH] 2189). See Women's and Gender Studies [WGST] 2180 for course description.

**WGST 2200H. British Women Writers - Honors. 3 Credits.**

Study of works by important British women writers. We also consider the development of women's writing and the contribution of women writers to literature and to larger societal debates. Prerequisites: English [ENGLISH] 1000; sophomore standing. Honors eligibility required. May be repeated for credit.

**WGST 2250. Perspectives on Gender, Race, Class and Sexuality in the Americas. 3 Credits.**

Introduction to the formation of identities in the Americas. Some areas covered are immigration, transnational identity, pop culture, literary expression, body image, spirituality, racism/sexism, assimilation, acculturation, and activism. May be repeated for credit with different semester themes.

**WGST 2260. Perspectives on Mass Media: Constructions of Gender, Race and Sexuality. 3 Credits.**

Examines constructions of gender, race, class and sexuality in the US media in the twentieth and twenty first centuries. Emphasis placed on media's coverage and uses of various socially constructed identities. May be repeated for credit with different semester themes.

**WGST 2340. Perspectives on Gender and Popular Culture. 3 Credits.**

Explores issues in popular culture in the 20th and 21st centuries with respect to feminism, gender, sexuality, race, class, and ability. Areas of study may include television, movies, music, advertisements, magazines, fiction, newspapers, the internet, and social media. May be repeated for credit. Prerequisite: sophomore standing.

**WGST 2370. French and Francophone Women Writers. 3 Credits.**

(same as French [FRENCH] 2370). This course will address issues of race, gender and class in selected works originally written by women of different historical periods and geographical areas. (metropolitan France, French colonies, and territories such as the Caribbean).

**WGST 2400. Social History of U.S. Women. 3 Credits.**

(same as History [HIST] 2400). This course, the social history of US women, offers a general overview of US women, beginning with the colonial period up to the present day.

**WGST 2410. African American Women in History. 3 Credits.**

(same as History [HIST] and Black Studies [BL\_STU] 2410). Covers major issues affecting black women since their introduction into English-speaking North America to the present.

**WGST 2500. Philosophy and Gender. 3 Credits.**

(same as Philosophy [PHIL] 2500). A critical examination of central ideas and themes in feminist philosophical thought. Topics may include: sex, marriage, parenthood, reproduction, body image, pornography, prostitution. Prerequisite: sophomore standing.

**WGST 2960. Sexual Health Advocacy and Service Learning. 3 Credits.**

Students will critically investigate sexuality and reproductive health within a cultural context including religious, political, social justice, familial, and societal influences. Through assigned readings, reflection, experiential learning, small group activities and discussion, students will increase their awareness of sexual health issues, enhance self awareness, and learn how to effectively educate their peers surrounding issues of sexual health. Prerequisite: sophomore standing.

**WGST 3001. Topics in Women's and Gender Studies-General. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content

areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 3003. Topics in Women's and Gender Studies-Behavioral Sciences. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 3004. Topics in Women's and Gender Studies-Social Sciences. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 3005. Topics in Women's and Gender Studies-Humanities. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 3080. Sexuality and Gender Theory. 3 Credits.**

(same as English [ENGLSH] 3080). Examination of major theoretical approaches and debates in the study of gender and sexuality, with particular attention to the intersection of culture, representation, and identity. May be repeated to 6 hours with departments consent. Prerequisite: sophomore standing.

**WGST 3180. Historical Survey of Women Writers. 3 Credits.**

(same as English [ENGLSH] 3180). A study of writing by women from the Middle Ages to the present. Prerequisite: sophomore standing.

**WGST 3220. U.S. Women's Political History, 1880-Present. 3 Credits.**

(same as History [HIST] 3220). This course explores American women's engagement with American politics (broadly defined) over the course of the twentieth century. It addresses issues of political identity, organization, ideology, and division. Prerequisite: sophomore standing.

**WGST 3230. Themes in Sexual Politics. 3 Credits.**

Explores transnational politics of sex/sexuality, examines the theoretical, historical, analytical, and socio-cultural context of race, gender and sexuality. Students learn and apply a transdisciplinary approach and analyze shifts in the field of sexuality studies. Prerequisites: Women's and Gender Studies [WGST] 1120 or 1332; sophomore standing required. May be repeated for credit with different themes.

**WGST 3240. Nonprofit Work and the Pursuit of Social Justice. 3 Credits.**

This course provides an overview of the work of nonprofit organizations. It will be framed in a social justice paradigm and will explore women's role in nonprofit organizations, why women gravitate to nonprofits, and the implications of their work to achieve social justice. Prerequisite: junior standing.

**WGST 3300. Queer Theories/Identities. 3 Credits.**

(same as Sociology [SOCIO] 3300). Analysis of gay, lesbian, bisexual, transgender (glbt) and queer identities in culture and society with an emphasis on the contributions of queer theory and other glbt standpoint theories to sociology and the study of society. Prerequisite: Sociology [SOCIO] 2200 or instructor's consent.

**WGST 3320. Sociology of Gender. 3 Credits.**

(same as Sociology [SOCIO] 3320). Study of the ways in which femininities and masculinities are constructed in American society with particular attention to gender ideologies and the gendered nature of the social structure. Prerequisites: SOCIOL 1000, 1360 or equivalent.

**WGST 3370. Themes in Gender, Religion and Spirituality. 3 Credits.**

The cultural expressions and organizational structures of religion have been a vehicle for those in power to express domination, but religion has also been a site where the oppressed and marginalized express claims for autonomy and justice. With an intersectional analytic framework, we explore themes of empowerment/subjugation. May be repeated for credit. Prerequisite: junior standing.

**WGST 3430. Sex Radicals in U. S. History. 3 Credits.**

(same as History [HIST] 3430). Survey of the history of sexuality in the United States. Prerequisite: sophomore standing.

**WGST 3450. Feminist Methodologies. 3 Credits.**

This course is an opportunity to explore the difference that feminism makes in doing research. Students can begin to identify the research tools and strategies suited to questions they want to pursue. Prerequisite: sophomore standing.

**WGST 3480. Themes in Sexuality and Literature. 3 Credits.**

Examines sexuality and representations of sexuality in literature. The specific topic will be announced at the time of registration. May be repeated for credit with different semester themes. Prerequisite: English [ENGLSH] 1000; sophomore standing.

**WGST 3560. Themes in Gender and Immigration. 3 Credits.**

Explores current controversies in immigration in various locations. The course will cover a number of topics including nationalism and citizenship, national identity, identity and fluidity, social inequality and others. May be repeated for credit with different semester themes.

**WGST 3570. European Women in the 19th Century. 3 Credits.**

(same as History [HIST] 3570). Examines the history of European women from 1750 to 1900. The course focuses on how industrialization, the French Revolution and nation-formation changed women's role in the family, workplace and the state. Grading: exams, papers and discussions. Prerequisite: sophomore standing.

**WGST 3670. Themes in Gender and Globalization. 3 Credits.**

Introduces transnational feminist theories, considers the practices and material circumstances related to globalization, and explores how class, gender, place/nation, (dis) ability, sexuality and colonial practices complicate our understanding of globalization. Prerequisite: Women's and Gender Studies [WGST] 1120; sophomore standing. May be repeated for credit with different semester themes.

**WGST 3750. Women and Religions. 3 Credits.**

(same as Religious Studies [REL\_ST] 3750). A rediscovery of the wealth of religious activity which women have created and enacted. Investigates women's roles and rituals in large-scale and local religions, including ancient Goddess religions, Hinduism, Buddhism, Judaism, Christianity, Islam, and African, South American, and native American groups. Prerequisite: sophomore standing.

**WGST 3850. Themes in Gender and the Politics of Representation. 3 Credits.**

Examines the gendered politics of representation by analyzing film, literature, popular media, and/or other popular cultural texts. May be repeated for credit with different semester themes.



**WGST 3870. Russian Women and Film. 3 Credits.**

(Same as Russian [RUSS] 3870 and Film Studies [FILM\_S] 3870) Traces image(s) of the Russian woman in 20th-century Russia as constructed in Russian, Soviet and late-Soviet film. Discusses heroines of pre-revolutionary melodrama and "new Soviet man and woman" of the 20s. Considers war-time re-alignment of gender roles in defense of motherland and their subtle revamping in post-war and post-Stalinist period, and the shifting relations between women and men, women and women, and women and the State. Emphasizes cultural-historical and ideological status of women as reflected in onscreen image(s) in Russian film. Designed to serve as an introduction to film studies and to 20th-century Russian culture more generally. Conducted in English (all films have English subtitles). Prerequisite: sophomore standing or instructor's consent.

**WGST 3960. Strategies for Effective Peer Education. 1 Credit.**

Course is designed to promote effective presentation skills on a variety of health topics, specifically sexual health. Students will engage in experiential practice and skill building surrounding cultural competency, difficult discourses, discussion facilitation and behavior management. Prerequisite: instructor's consent.

**WGST 4001. Topics in Women's and Gender Studies-General. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 4003. Topics in Women's and Gender Studies-Behavioral Sciences. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 4004. Topics in Women's and Gender Studies-Social Sciences. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 4005. Topics in Women's and Gender Studies-Humanities. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 4020. Studies in Feminist Thought. 3 Credits.**

Examines recent problems and critical debates within feminist theory. Prerequisite: Women's and Gender Studies [WGST] 2020 or instructor's consent. May be repeated for credit with different semester themes.

**WGST 4110. Feminist Research and Criticism. 3 Credits.**

(Same as Sociology [SOCIO] 4110) Examination of both feminist critique of traditional social research and recent, feminist-oriented research that attempts to answer these criticisms. Prerequisite: SOCIO 2950 or equivalent.

**WGST 4120. Women, Art and Society. 3 Credits.**

(same as Art History and Archeology [AR\_H\_A] 4120). Analysis of the careers and works of women artists, and images of women (by female and male artists), in selected eras. Prerequisite: instructor's consent.

**WGST 4180. Major Women Writers. 3 Credits.**

(same as English [ENGLSH] 4180). Study of a limited number (1-3) of significant writers to be read intensively using contemporary feminist critical theory. Prerequisites: two courses in British or American Literature. Repeatable with department's consent maximum of six hours for Women's and Gender Studies [WGST] 4180 and 4480.

**WGST 4181. Themes in Literature by Women. 3 Credits.**

(same as English [ENGLSH] and Black Studies [BL\_STU] 4181). Examines works by a number of women writers with particular attention to their sociopolitical context. May repeat to six hours with department's consent. Prerequisite: junior standing.

**WGST 4186. Major Women Writers, Beginning to 1603. 3 Credits.**

(same as English [ENGLSH] 4186). See Women's and Gender Studies [WGST] 4180 for course description.

**WGST 4187. Major Women Writers, 1603-1789. 3 Credits.**

(same as English [ENGLSH] 4187). See Women's and Gender Studies [WGST] 4180 for course description.

**WGST 4188. Major Women Writers, 1789-1890. 3 Credits.**

(same as English [ENGLSH] 4188). See Women's and Gender Studies [WGST] 4180 for course description.

**WGST 4189. Major Women Writers, 1890-Present. 3 Credits.**

(same as English [ENGLSH] 4189). See Women's and Gender Studies [WGST] 4180 for course description.

**WGST 4230. Women, Development, and Globalization. 3 Credits.**

(same as Sociology [SOCIO] 4230, Black Studies [BL\_STU] 4230 and Peace Studies [PEA\_ST] 4230). Examines the history and structure of "development" discourse and practices. Stresses the interconnections and impact on women globally. Reviews women's strategies in defining and instituting programs to improve quality of life in communities. Prerequisites: BL\_STU 1332, 2200; SOCIO 2200; WGST 1332 or 2010.

**WGST 4310. Adoption, Child Welfare and the Family, 1850-Present. 3 Credits.**

(same as History [HIST] 4310). This interdisciplinary U.S. history course will address topics such as: changing legal and social meaning of adoption since 1850; historical connections between adoption and poverty, family, gender race, sexuality, class, fertility, identity; and more recent issues such as transnational adoption.

**WGST 4370. Anthropology of Gender. 3 Credits.**

(same as Anthropology [ANTHRO] 4370). The Anthropology of Gender introduces the student to the variation in the relationships between male and females; and between men, women, and other genders from around the world. The different approaches to understanding and modeling gender are discussed, as are specific case-studies from many different cultures.

**WGST 4400. Contemporary Issues in Domestic Violence. 3 Credits.**

(same as Social Work [SOC\_WK] 4400). This 3-hour course covers history of battered women's movement, violence theories, policy issues, prevention and intervention practice models for working with battered women, their children, and abusers. Graded on A/F basis only.

**WGST 4420. Studies in Gender, Culture, and Politics. 3 Credits.**

Examines ethical issues, social policies and politics, and cultural practices affecting women in specific national and global contexts. Prerequisite: junior standing or instructor's consent. May be repeated for credit with different semester themes.

**WGST 4480. Major African Diaspora Women Writers. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 4480). Study of selected Africana Diaspora women writers, focusing on texts originally in English. Repeatable with department's consent. Maximum of 6 hours for Women's and Gender Studies [WGST] 4180 and 4480.

**WGST 4487. Major African Diaspora Women Writers, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 4487). See Women's and Gender Studies [WGST] 4480 for course description.

**WGST 4488. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 4488). See Women's and Gender Studies [WGST] 4480 for course description.

**WGST 4489. Major African Diaspora Women Writers, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 4489). See Women's and Gender Studies [WGST] 4480 for course description.

**WGST 4550. Gender and Human Rights in Cross Cultural Perspective. 3 Credits.**

(same as Sociology [SOCIO] 4550 and Peace Studies [PEA\_ST] 4550). This course focuses on the global discourse on human rights and gender, emphasizing cross-cultural theories. Course includes the meaning of rights, Western and nonwestern perspectives, feminist contributions, important substantive debates, violations, policymaking and activism. Prerequisites: Women's and Gender Studies [WGST] 1120 or SOCIO 2200; senior standing required.

**WGST 4600. Studies in Women and Health. 3 Credits.**

A survey of international and domestic women's health issues; considers historical antecedents and specific effects of socio-cultural variables and economic development on women's health in developing and developed nations. May be repeated for credit with different semester themes.

**WGST 4640. Studies in Gender and Performance. 3 Credits.**

Examines the relationship among gender, race, class, and/or sexuality, and performance. Course materials may include theatre performance, visual art, literacy context, theoretical essays, films, and popular culture. May be repeated for credit with different semester themes. Prerequisite: junior standing.

**WGST 4660. European Women in the 20th Century. 3 Credits.**

(same as History [HIST] 4660). Examines the history of European women from World War I to the present. The course focuses on wars, migration, and the changing nature of family, work and community. Prerequisite: junior standing.

**WGST 4716. Women and the Media. 2 Credits.**

(same as Journalism [JOURN] 4716). Focus on portrayal of women in American mass media. Other goals: historical perspective on women as journalists; exposure to issues usually not covered by mass media; research and writing skills. Prerequisite: instructor's consent.

**WGST 4730. Women and Politics. 3 Credits.**

(same as Political Science [POL\_SC] 4730). This course examines women's political participation and public policies towards women in countries around the world. Prerequisites: POL\_SC 1100; junior standing.

**WGST 4750. Women, Religion and Culture. 3 Credits.**

(same as Religious Studies [REL\_ST] 4750). An advanced study of the role of women in religion, focusing on the methods of determining the significance of gender in religious life, sacred texts, symbols, rituals and/or beliefs. Traditions studied include Christianity, Islam, contemporary pagan communities, and Native American traditions. Prerequisite: REL\_ST/Women's and Gender Studies [WGST] 3750 or instructor's consent.

**WGST 4780. Women's Folklore and Feminist Theory. 3 Credits.**

(same as English [ENGLSH] 4780). Examines folklore and artistic expression of women in relations to feminist theory and in multicultural contexts. Includes verbal genres (narrative/song) as well as material genres (quilting/arts). Prerequisite: junior standing or instructor's consent.

**WGST 4873. Women's and Gender Studies Abroad - Behavioral Science. 3 Credits.**

This interdisciplinary study abroad course provides students the opportunity to study women's issues in the globe, to study in a foreign culture and augment their global competencies across the WGST curriculum and extend a global perspective to their study and/or career development.

**WGST 4874. Women's and Gender Studies Abroad - Social Science. 3 Credits.**

This interdisciplinary study abroad course provides students the opportunity to study women's issues in the globe, to study in a foreign culture and augment their global competencies across the Women's and Gender Studies [WGST] curriculum and extend a global perspective to their study and/or career development.

**WGST 4875. Women's and Gender Studies Abroad - Humanities. 3 Credits.**

This interdisciplinary study abroad course provides students the opportunity to study women's issues in the globe, to study in a foreign culture and augment their global competencies across the Women's and Gender Studies [WGST] curriculum and extend a global perspective to their study and/or career development.

**WGST 4940. Internship in Women's and Gender Studies. 1-12 Credit.**

Directed professional experience in appropriate feminist related agency or organization. Prerequisite: junior standing; departmental consent. Graded on S/U basis only.

**WGST 4965. Special Readings in Women's and Gender Studies. 1-6 Credit.**

Independent readings in women's and gender studies for highly qualified and motivated students. Topic selected in consultation with supervisory faculty member. Repeatable up to 6 hours. Prerequisite: junior standing and/or Women's and Gender Studies [WGST] 1120.

**WGST 4990. Capstone: Senior Research Seminar in Women's and Gender Studies. 3 Credits.**

Seminar for senior students earning interdisciplinary B.A. with emphasis in WGST. Students will reflect knowledge and experience gained as WGST majors and explore taking that knowledge and experience out in the "real world". Prerequisite: instructor's consent.

**WGST 7001. Topics in Women's and Gender Studies-General. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 7003. Topics in Women's and Gender Studies-Behavioral Studies. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 7004. Topics in Women's and Gender Studies-Social Science. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 7005. Topics in Women's and Gender Studies-Humanities. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 7020. Studies in Feminist Thought. 3 Credits.**

Examines recent problems and critical debates within feminist theory. Prerequisite: graduate standing.

**WGST 7110. Feminist Research and Criticism. 3 Credits.**

(Same as Sociology [SOCIO] 7110). Examination of both feminist critique of traditional social research and recent, feminist-oriented research that attempts to answer these criticisms. Prerequisite: graduate standing.

**WGST 7120. Women, Art and Society. 3 Credits.**

(same as Art History and Archeology [AR\_H\_A] 7120). Analysis of the careers and works of women artists, and images of women (by female and male artists), in selected eras. Prerequisite: instructor's consent.

**WGST 7180. Major Women Writers. 3 Credits.**

(same as English [ENGLSH] 7180). Study of a limited number (1-3) of significant writers to be read intensively using contemporary feminist critical theory. Prerequisites: two courses in British or American Literature. Repeatable with department's consent maximum of six hours for Women's and Gender Studies [WGST] 7180 and 7480.

**WGST 7181. Themes in Literature by Women. 3 Credits.**

(same as English [ENGLSH] 7181). Examines works by a number of women writers with particular attention to their sociopolitical context. May repeat to six hours with department's consent. Prerequisite: graduate standing.

**WGST 7186. Major Women Writers, Beginning to 1603. 3 Credits.**

(same as English [ENGLSH] 7186). See Women's and Gender Studies [WGST] 7180 for course description.

**WGST 7187. Major Women Writers, 1603-1789. 3 Credits.**

(same as English [ENGLSH] 7187). See Women's and Gender Studies [WGST] 7180 for course description.

**WGST 7188. Major Women Writers, 1789-1890. 3 Credits.**

(same as English [ENGLSH] 7188). See Women's and Gender Studies [WGST] 7180 for course description.

**WGST 7189. Major Women Writers, 1890-Present. 3 Credits.**

(same as English [ENGLSH] 7189). See Women's and Gender Studies [WGST] 7180 for course description.

**WGST 7230. Women, Development, and Globalization. 3 Credits.**

(same as Sociology [SOCIO] 7230). Examines the history and structure of "development" discourse and practices. Stresses the interconnections and impact on women globally. Reviews women's strategies in defining

and instituting programs to improve quality of life in communities.

Prerequisites: graduate standing.

**WGST 7310. Adoption, Child Welfare and the Family, 1850-present. 3 Credits.**

(Same as History [HIST] 7310) This interdisciplinary U.S. history course will address topics such as: changing legal and social meanings of adoption since 1850; historical connections between adoption and poverty, family, gender, race, sexuality, class, fertility, identity; and more recent issues such as transnational adoption. Graduate standing required.

**WGST 7370. Anthropology of Gender. 3 Credits.**

(Same as Anthropology [ANTHRO] 7370) The Anthropology of Gender Introduces the student to the variation in the relationships between males and females; and between men, women, and other genders from around the world. The different approaches to understanding and modeling gender are discussed, as are specific case-studies from many different cultures. Graduate standing required.

**WGST 7400. Contemporary Issues in Domestic Violence. 3 Credits.**

(same as Social Work [SOC\_WK] 7400). This 3-hour course covers history of battered women's movement, violence theories, policy issues, prevention and intervention practice models for working with battered women, their children, and abusers. Graded on A/F basis only. Prerequisite: graduate standing.

**WGST 7420. Studies in Gender, Culture, and Politics. 3 Credits.**

Examines ethical issues, social policies and politics, and cultural practices affecting women in specific national and global contexts. Prerequisite: graduate standing.

**WGST 7480. Major African Diaspora Women Writers. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 7480). Study of selected African Diaspora women writers, focusing on texts originally in English. Repeatable with department's consent. Maximum of 6 hours for Women's and Gender Studies [WGST] 7180 and 7480.

**WGST 7487. Major African Diaspora Women Writers, 1603 to 1789. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 7487). See Women's and Gender Studies [WGST] 7480 for course description.

**WGST 7488. Major African Diaspora Women Writers, 1789 to 1890. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 7488). See Women's and Gender Studies [WGST] 7480 for course description.

**WGST 7489. Major African Diaspora Women Writers, 1890 to Present. 3 Credits.**

(same as Black Studies [BL\_STU] and English [ENGLSH] 7489). See Women's and Gender Studies [WGST] 7480 for course description.

**WGST 7550. Gender and Human Rights in Cross Cultural Perspective. 3 Credits.**

(same as Sociology [SOCIO]/Peace Studies [PEA\_ST] 7550). Focuses on the global discourse on human rights and gender, emphasizing cross-cultural theories. Course includes the meaning of human rights, western and nonwestern perspectives, feminist contributions, important substantive debates, violations, policymaking and activism. Prerequisites: graduate standing.

**WGST 7600. Studies in Women and Health. 3 Credits.**

A survey of international and domestic women's health issues; considers historical antecedents and specific effects of socio-cultural variables and

economic development on women's health in developing and developed nations. Prerequisite: graduate standing.

**WGST 7640. Studies in Gender and Performance. 3 Credits.**

Examines the relationships among gender, race, class, and/or sexuality, and performance. Course materials may include theatre performance, visual art, literary texts, theoretical essays, films, and popular culture. Graduate standing required. May be repeated for credit.

**WGST 7660. European Women in the 20th Century. 3 Credits.**

(same as History [HIST] 7660). Examines the history of European women from World War I to the present. The course focuses on wars, migration, and the changing nature of family, work and community. Prerequisite: graduate standing.

**WGST 7716. Women and the Media. 2 Credits.**

(same as Journalism [JOURN] 7716). Focus on portrayal of women in American mass media. Other goals: historical perspective on women as journalists; exposure to issues usually not covered by mass media; research and writing skills. Prerequisite: graduate standing and instructor's consent.

**WGST 7750. Women, Religion and Culture. 3 Credits.**

(same as Religious Studies [REL\_ST] 7750). An advanced study of the role of women in religion, focusing on the methods of determining the significance of gender in religious life, sacred texts, symbols, rituals and/or beliefs. Traditions studied include Christianity, Islam, contemporary pagan communities, and Native American traditions. Prerequisite: graduate standing.

**WGST 7780. Women's Folklore and Feminist Theory. 3 Credits.**

(same as English [ENGLSH] 7780). Examines folklore and artistic expression of women in relations to feminist theory and in multicultural contexts. Includes verbal genres (narrative/song) as well as material genres (quilting/arts). Prerequisite: graduate standing or instructor's consent.

**WGST 7873. Women's and Gender Studies Abroad - Behavioral Science. 3 Credits.**

This interdisciplinary study abroad course provides students the opportunity to study women's issues in the globe, to study in a foreign culture and augment their global competencies across the Women's and Gender Studies [WGST] curriculum and extend a global perspective to their study and/or career development.

**WGST 7874. Women's and Gender Studies Abroad-Social Science. 3 Credits.**

This interdisciplinary study abroad course provides students the opportunity to study women's issues in the globe, to study in a foreign culture and augment their global competencies across the Women's and Gender Studies [WGST] curriculum and extend a global perspective to their study and/or career development.

**WGST 7875. Women's and Gender Studies Abroad - Humanities. 3 Credits.**

This interdisciplinary study abroad course provides students the opportunity to study women's issues in the globe, to study in a foreign culture and augment their global competencies across the Women's and Gender Studies [WGST] curriculum and extend a global perspective to their study and/or career development.

**WGST 8001. Topics in Women's and Gender Studies-General. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 8003. Topics in Women's and Gender Studies-Behavioral. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 8004. Topics in Women's and Gender Studies-Social Science. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 8005. Topics in Women's and Gender Studies-Humanities. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Repeatable. Prerequisite: graduate standing.

**WGST 8020. Graduate Feminist Theory. 3 Credits.**

This course will explore the texts and contexts of feminist theories including women of color socialist/Marxist feminism, queer theory, postmodern feminism, and feminist postcolonial theory.

**WGST 8040. Seminar: Problems and Issues in Feminist Scholarship. 3 Credits.**

This course is a broad based exploration of a range of current feminist scholarship, both multidisciplinary and interdisciplinary. Issues of identity and difference, community and change are explored through the complicating lenses of race and sexuality.

**WGST 8060. New Directions in Feminist Theory. 3 Credits.**

Offers an in-depth exploration of a recent direction in feminist theory. Students will learn a specific feminist approach to scholarship. Theory explored will change based on the semester and professor teaching the course. Graduate standing required.

**WGST 8400. Women Writers of the African Diaspora. 3 Credits.**

Closely studies the works of women writers in the African Diaspora. Graduate Standing Required.

**WGST 8410. Africana Theory and Literature Criticism: Black Feminist/Womanist Thought. 3 Credits.**

Modern and contemporary Africana Diaspora criticism and theory including the diverse approaches to literary and cultural studies. Prerequisite: graduate standing.

**WGST 8620. Work and Family Seminar. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 8620). Interaction of family life and income-producing work with attention to how these interconnections vary by social class, gender, race/ethnicity, and age.

**WGST 8630. Gendered Relations in Families. 3 Credits.**

(same as Human Development and Family Studies [H\_D\_FS] 8630). From a feminist perspective, the roles of gender in shaping family life experience and of family life experience in shaping gender will be explored. Prerequisite: graduate standing; instructor's consent. Graded on A/F basis only.

**WGST 8965. Problems in Women's and Gender Studies. 1-6 Credit.**

Directed individual study on selected topics for qualified graduate students. Plan of study subject to approval by supervising faculty.

Prerequisite: departmental consent.

**WGST 9001. Topics in Women's and Gender Studies. 1-3 Credit.**

Problems, topics, issues or review of research in any area of women's and gender studies and/or experimental development of new content areas. Prerequisites: graduate standing, instructor's consent. May be repeated for credit.

**WGST 9440. Race, Gender, Ethnicity in Higher Education. 3 Credits.**

(same as Educational Leadership and Policy Analysis [ED\_LPA] 9440). Historical relationships of race, gender, and ethnic issues in United States higher education. Issues include: theory and research of curriculum and teaching, diversity within the academy, and leadership, governance, and policy. Prerequisite: graduate standing.

## Faculty

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**Abagiu, Catalin Ion**; Instructor, Adjunct; Journalism; Master of Arts; University of Missouri

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