

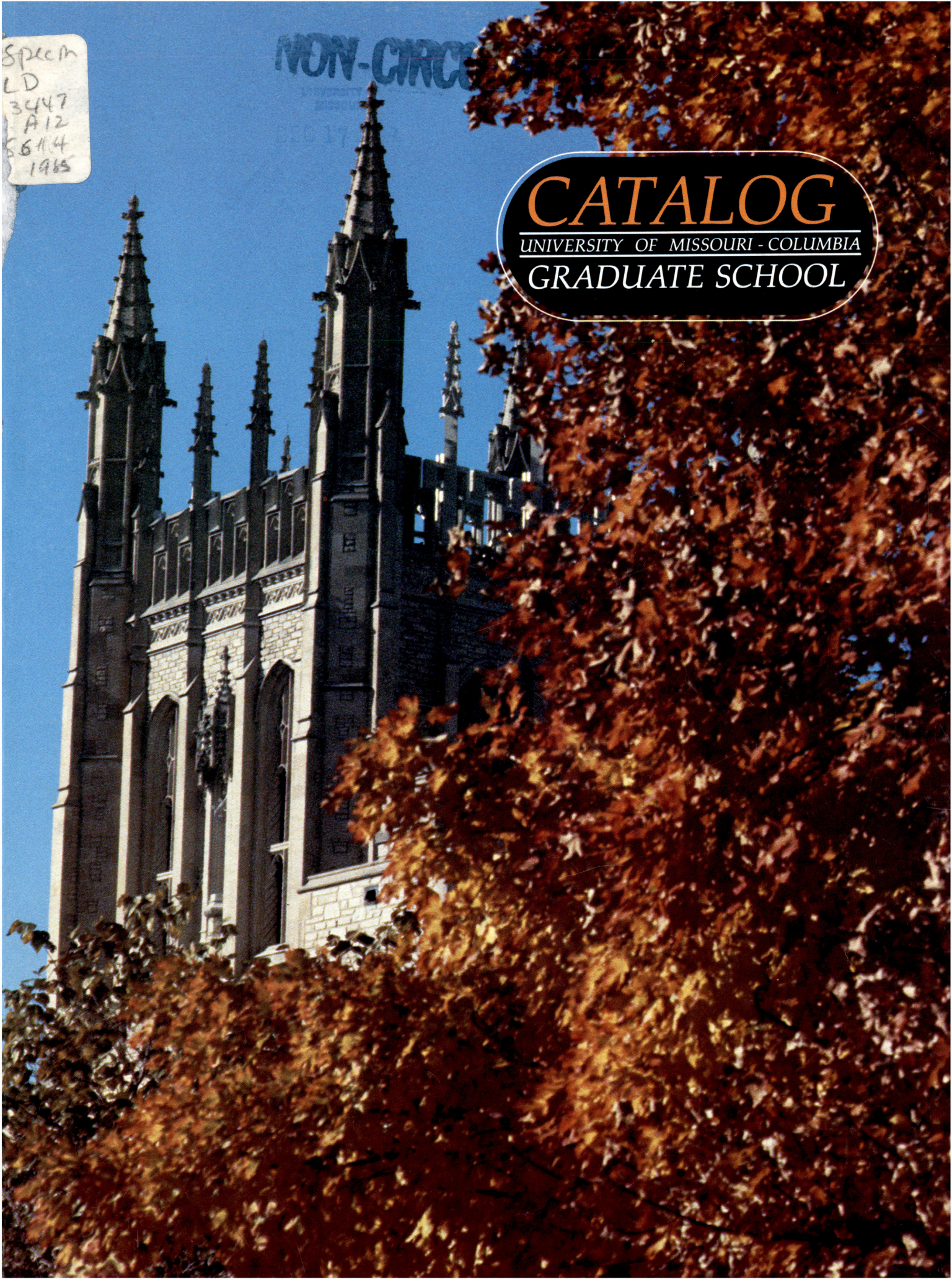
Spec 11
LD
3447
A12
S6114
1965

NON-CIRC

CATALOG

UNIVERSITY OF MISSOURI - COLUMBIA

GRADUATE SCHOOL



**UNIVERSITY OF MISSOURI
BOARD OF CURATORS**

Doug Russell, president
James S. Anderson, vice president
W. H. Bates
William G. Cocos Jr.
Jeanne V. Epple
Eva Louise Frazer, MD
John P. Lichtenegger
Tom K. Smith Jr.
Edwin S. Turner

**THE UNIVERSITY
OF MISSOURI
ADMINISTRATION**

C. Peter Magrath, president
L. Thomas Hussey, interim vice president for
Administrative Affairs
Jay Barton, vice president for Academic Affairs

**THE UNIVERSITY
OF MISSOURI-COLUMBIA
ADMINISTRATION**

Barbara S. Uehling, chancellor
Ronald R. Bunn, provost
Norman Moore, vice chancellor for Student,
Personnel and Auxiliary Services
Duane Stucky, vice chancellor for Administra-
tive Service
Roger Gafke, vice chancellor for Development,
University and Alumni Relations

**DEANS OF
SCHOOLS AND COLLEGES**

Roger Mitchell, College of Agriculture
Milton Glick, College of Arts and Science
Stanley J. Hille, College of Business and Pub-
lic Administration
Bob G. Woods, College of Education
William R. Kimel, College of Engineering
Don H. Blount, Graduate School
Bea Litherland, College of Home Economics
James Atwater, School of Journalism
Dale Whitman, School of Law
Mary Lenox, School of Library and Informa-
tional Science
William Bradshaw, School of Medicine
Phyllis Drennan, School of Nursing
George F. Nickolaus, College of Public and
Community Services
Robert Kahrs, College of Veterinary Medicine

**UNIVERSITY OF
MISSOURI-COLUMBIA
CATALOG (651-82000)**

Volume 86 Number 4 November 1985
General 1985 Series Number 4
Published by the UMC Publications and
Alumni Communications Office, a division
of University and Alumni Relations and
Development, 1100 University Place, 1205
University Ave., Columbia, MO 65211. Issued
four times a year as follows: January, July,
September and November. Second class post-
age paid at Columbia, MO. POSTMASTER:
Send form 3579 to 1100 University Place,
1205 University Ave., Columbia, MO 65211.

All statements in this publication are an-
nouncements of present policies only and are
subject to change at any time without prior
notice. They are not to be regarded as offers to
contract.

The University of Missouri is an Equal
Opportunity/Affirmative Action institution
and is nondiscriminatory relative to race,
religion, color, national origin, sex, age and
qualified disabled.

TABLE OF CONTENTS

General Information2
Facilities and Resources4
Research Centers and Resources7
Registration, Fees and Student Services9
Academic Procedures13
Master's Degrees15
Educational Specialist Degree.....17
Doctoral Degrees18
Fields of Study21
Area Programs.....78
Statement of Courses85
Index103
Admissions Application.....105
Academic Calendar107
Graduate School Deadlines109

GENERAL INFORMATION

THE UNIVERSITY OF MISSOURI-COLUMBIA

The University of Missouri-Columbia, established in 1839, is the oldest state university west of the Mississippi river. The Columbia campus is the largest in the four campus, University-wide system, with other campuses located in St. Louis, Kansas City and Rolla.

Masters' degrees were awarded at UMC as early as 1846, with the first doctor of philosophy degree awarded in 1899. The University offers a comprehensive and diverse educational experience and is a premier public institution of graduate and professional education.

The University creates many intellectual experiences outside the classroom, including concerts, dramatic productions, and exhibits. Many campus groups sponsor specialized seminars, lectures, visiting scholars, film series, and musical programs.

Approximately one third of the campus's budget comes from state appropriations. The sources of the remainder of the UMC budget include private gifts, grants, student tuition and fees, auxiliary enterprises and the hospital. In 1983-84, UMC received more than \$32.5 million in sponsored research funds. UMC also enjoys broad support from alumni.

GRADUATE SCHOOL

UMC's Graduate School offers degree-granting programs in 75 departments and areas. Graduate student enrollment is approximately 4,450 with more than 28 percent of that enrollment as doctoral candidates. UMC ranks among the nation's top 35 institutions in the number of doctoral degrees granted. It is a member of the Association of Graduate Schools and the Council of Graduate Schools.

The school has three major objectives. First, the school strives to contribute to an overall campus environment conducive to excellence in scholarly endeavor. As part of a campus with a comprehensive role in higher education, the school is a vigorous force for the maintenance of high standards in instruction and research.

The second objective of the school is to promote and monitor the quality of graduate degree programs. In meeting this objective, it is the philosophy of the school that graduate programs be designed by the faculty to provide high quality education to meet both societal needs, and the career and intellectual objectives of individual students. This posture has required the recruitment and nurturing of responsible and highly qualified faculties in the various degree-

granting programs concurrent with developing substantial support services and facilities for the use of graduate students. In graduate programs, the classic student-mentor relationship is promoted.

The third objective of the school is to insure that the campus add significantly to the supply of knowledge as well as to transmit it. Accordingly, the school includes the Office of Research, and the dean of the school is also the vice-provost for research for the campus.

Through the Office of Research and in the implementation of its various other programs, the school encourages quality research, provides various research services, and participates in the administration of externally-funded research grants and contracts on the campus.

In striving to meet these three interrelated objectives, the school has placed heavy emphasis on the development of interdisciplinary research and teaching programs. The school administers three interdisciplinary research centers: the Dalton Research Center, the Center for Research in Social Behavior, and the Missouri Cultural Heritage Center. These centers involve faculty members from more than 35 different disciplines. In addition, the school supervises six area graduate programs in which advanced degrees are awarded and seven area programs that offer a minor field for graduate study.

The unique characteristics of the graduate educational process are the development of independent creative approaches to problem-solving and reliance on experiential learning. Key to these hallmarks of advanced education is the mentor-student relationship which creates the necessary climate for the acquisition of proper intellectual skills. This intimate interaction with the faculty allows the student to develop insights into the approaches scholars use to analyze life situations. Benefits of such an intellectual partnership are rewarding to both the student and the mentor. It is far from being a simple apprenticeship, because both participants are in the process of creating a new experience, a different perspective. It is to this end that the University is dedicated.

The school encourages the participation of students in the affairs of the school and its faculty. This effort has resulted in a vigorous Graduate Student Association, which places members on most school and Graduate Faculty Senate committees. Students have made substantial contributions to the committees, and perhaps more important, these appointments have opened up lines of com-

munication among students, faculty, and administrators.

The University provides an effective environment for research. In order to maintain its teaching programs at the undergraduate, graduate, and professional levels, the University must provide faculty, staff, laboratories, libraries, computers, and other special facilities which are also necessary for the systematic investigation, experimentation, and creative activity involved in research. By utilizing these resources in a dual research-teaching role, the effectiveness of both activities is enhanced and substantial economies result from the sharing.

The school disseminates information concerning opportunities for external funding for research and reviews proposals for such funding to determine their consistency with the research policies of the University. The school provides encouragement for faculty research activities through grants, travel support, symposia support, and research fellowships. This money is allocated by the graduate dean upon advice of the research council. This council is appointed by the dean and is composed of experienced research-scholars who evaluate proposals. A portion of the council's funds is reserved for a summer research fellowship program that provides partial support for summer salaries of faculty members engaged in research projects. Selection is on a competitive basis; research proposals are reviewed and ranked by peer evaluation.

GOVERNANCE OF THE GRADUATE SCHOOL

The school is directed by the dean who also holds the title of vice provost for research, as indicated in the previous section. The combined positions underscore the essential unity of graduate education and research. In addition to graduate and research responsibilities, the dean also serves as a member of the campus Committee on Promotion and Tenure, and the University-wide Doctoral Council. Two associate deans assist the dean in meeting the responsibilities of the school. Their responsibilities are broadly defined in the areas of academic programs and research.

The Graduate Faculty Senate is the governing body of the faculty, and its membership is composed of representatives elected by the departments. Much of the work of the Senate is organized around six academic sectors: biological sciences, humanities, mathematical sciences, physical sciences, social sciences, and behavioral sciences. Course changes,

degree requirements, membership applications, and other matters are reviewed by the appropriate sector committee, which then makes recommendations to the Senate as a whole. In addition to the sector committees, four standing committees consider general policy matters related to academic affairs, problems and procedures, membership, and research affairs. The activities of the senate are guided and coordinated by an Executive Committee, consisting of the six sector chairpersons, the chairpersons of the four standing committees, an elected secretary, and the president of the Graduate Student Association. The president of the senate chairs the committee.

Membership in the graduate faculty requires appointment to the rank of assistant professor or above in a department or area, and, usually, the terminal degree in the graduate program of the department or area. Of the 1,380 faculty members at UMC, 1,129 are members of the graduate faculty.

The first doctoral faculty was selected during the 1973-74 academic year. To supervise doctoral dissertations, a faculty member must be a member of the University doctoral faculty in addition to being a member of the graduate faculty. The selection process involves both campus and intercampus faculty committees which screen applications submitted by the academic departments. The process is coordinated by a University-wide doctoral council, composed of the graduate deans and two elected faculty members from each campus. Appointment to the doctoral faculty is for a five year term.

To facilitate communication and to promote quality control in graduate education, each department offering a graduate program selects a faculty member to serve as director of graduate studies. The role of the director is to facilitate communications between the graduate school, students and faculty and provide advice to students on graduate school and departmental regulations. Also, the directors are charged with providing the Graduate School with the current regulations for their individual graduate programs. The directors of Graduate Studies play a key role in improving the information flow between the Graduate School and the various programs. It is the responsibility of the director to apply, in a uniform manner, the rules of the Graduate School and to aid in the maintenance of the educational standards of the departments and the University.

Prospective students are encouraged to write to the director of graduate studies in their areas of academic interest for information beyond that provided in this catalog. Inquiries may also be addressed to the dean of the Graduate School.

THE GRADUATE CATALOG

The purposes of this catalog are to introduce the student to the

opportunities for graduate education at UMC and to serve as a matriculation guide. First, the resources and facilities supporting graduate teaching and research are listed. Next, admission procedures, fees, and student services are detailed as are academic rules and procedures in the section following. Departments may set higher standards than those required by the Graduate School and their requirements are detailed later under Fields of Study. In the last section of the catalog are *Fields of Study* followed by a complete list of courses offered by the University, numbered 200 and above.

This catalog does not provide detailed information on the professional schools of Medicine, Law, and the College of Veterinary Medicine. However, departments of the College of Veterinary Medicine and the basic science departments of the School of Medicine offering graduate education are listed. Students wanting information on these professional programs should consult the individual catalog of the school or college. These programs are briefly described below.

The School of Medicine was established at the University in 1845. The Medical School educates physicians and health care professionals of the highest competence through undergraduate, postgraduate, and continuing medical education. The University Hospital and Clinics provides general and highly specialized care for patients from every county of Missouri. Within the School of Medicine is the School of Health Related Professions, whose graduate degrees are described in this catalog.

The UMC School of Law was established in 1872, and it has been a powerful force in the State and nation since. Graduates of the School of Law have served and serve now at the highest levels of national, state, and local governments. Graduates of the Law School and law faculty members have written the majority of Missouri laws. The School of Law educates lawyers who practice not only in Missouri but throughout the world.

The College of Veterinary Medicine was established in 1946. While principally serving the state, graduates of the Veterinary Medicine College are located throughout the United States and the world in a variety of fields related to animal health and food production, as well as activities related to human health.



FACILITIES AND RESOURCES

UMC is located on a 692 acre campus and provides libraries, research centers, museums, and computing facilities to support and enhance graduate education and research.

LIBRARIES

The Libraries of the University include the Ellis Library with its nine branch libraries in various campus locations. The Libraries serve the University community with a collection of 2,206,104 volumes, 2,879,181 microforms, and receive more than 20,000 serial titles. A variety of services and staff members are available to answer questions and to provide advice and instruction in solving research problems. Brochures detailing services and hours are available in the libraries.

The collections of the State Historical Society of Missouri and the Western Historical Manuscripts Collection augment the holdings of the Libraries. The separately administrated Law Library, at 200 Tate Hall, contains both the originals and the reprints of the English reports and those of the British empire consisting of the Australian, Canadian, Irish, Indian, Scottish, South African and Colonial reports. The library has an almost complete collection of federal and state reports and statutes. There is a general selection from various reporting services of administrative regulations and rulings, new court decisions, new statutes and amendments to existing laws.

ELLIS LIBRARY. Ellis Library, which occupies an entire city block, is the main library housing more than 1,000,000 volumes. It has seven subject-related reading rooms with adjacent book stacks and several special collections and service areas. Area libraries within Ellis Library contain books and bound journals. The area libraries are:

Science (first floor, east). The Science Library includes 175,000 volumes in the biological sciences of agriculture, botany, zoology and related fields. The materials in the physical sciences, primarily chemistry and physics, add another 37,000 volumes. These holdings are complemented by the biological and physical science resources found in the branch libraries on other parts of the campus.

Social Science (second floor, east). The social science collection contains about 210,000 volumes including: business and economics, 130,000 volumes; political science, 35,000 volumes; and sociology, 42,000 volumes. Also in this area is the

Government Documents collection (see below).

Education-Psychology (second floor, central, and stacks). The education collection contains approximately 38,000 volumes and the psychology section contains 20,000 volumes. Also housed in this area is a school textbook collection and the ERIC (Educational Resources Information Centers) microfiche collection.

Language and Literature (second floor, west and stacks). The Language and Literature Library houses materials in American, English and other national literatures, speech, theater, linguistics and related resources. Approximately 208,000 volumes are included.

Geography, History and Philosophy (third floor, east). A total of 274,000 volumes are housed in this area library. There are 158,000 volumes in history; 33,000 in philosophy; 68,000 in religion; and 15,000 in geography. Supplementing the geography materials is a collection of 32,000 maps.

Art, Archaeology, and Music (fourth floor, east). This library area contains 106,000 volumes with particular strengths in: art history and painting, 68,000 volumes; anthropology, 17,000; and music, 21,000 volumes. The Recorded Sound Collection, also located in this area, contains more than 10,000 records.

Library Science (fourth floor, west). This collection of monographs and journals contains 30,000 volumes.

Special Collections and Bibliographic Material of Ellis Library. THE RARE BOOK COLLECTION (fourth floor west) is rich and varied. The collection's strength lies chiefly in the areas of illustrated books from the sixteenth to the twentieth century. Included are illustrated editions of Ovid's *Metamorphoses*, books of trades, books illustrating the themes "the dance of death" and "the book of fools," and emblem books. Works representing the Dada and Surrealist movement both as literary and artistic expressions are well represented. Important samples of printing from the Incunabula period, the 16th century, the English private press movement and contemporary U.S. and British private presses are available. Scarce works of literature, history and travel have been collected to aid researchers.

THE AMERICAN SPEECHES AND SERMONS COLLECTION contains approximately 1,200 speeches and sermons printed in America before 1800 and about 500 Fourth of July orations delivered during the first half of the 19th century.

THE JOHNSON COLLECTION, a gift of approximately 1,600 volumes from

the library of the late Thomas Moore Johnson of Osceola, Missouri, was received in 1947. The collection consists principally of works in philosophy, especially Plato and the Neoplatonists.

THE HOWEY COLLECTION of 16th, 17th, and 18th century English tracts provide a wealth of material important in the study of English politics and religious history. The collection of 22,000 titles includes pamphlets by prominent divines, political leaders and literary figures.

Other gifts and special collections donated by friends of the University continue to strengthen the library's holding. Outstanding gifts include a previously unpublished manuscript of Charlotte Bronte; the library and manuscripts of John Neihardt, the library of the late Dr. Frank Luther Mott; The William Peden collection of 20th century literature; the William Kerr collection of limited editions.

The Microform Collection is the ninth largest collection among members of the Association of Research Libraries. General material in the collection includes more than one thousand newspaper titles including 22 current major dailies and numerous periodicals including an extensive collection of early American periodicals. The collection also houses large collections of English imprints to 1700 and American imprints to 1820. Historical materials constitute one of the collection's strengths. Included are large sets of early state records, American, and early British government documents, papers of U.S. presidents and other important individuals and more than two hundred National Archives record groups.

Reference and Bibliographies. Reference materials may be found in the general reference area (second floor room 201) or in the reference collections in each of the seven subject area libraries. The library's collection of reference resources is quite comprehensive, containing more than 35,000 volumes. The standard American and British national bibliographies and the principal ones of France, Germany, Italy, Spain and other nations are available. Of equal importance are the great subject bibliographies and abstracting and indexing services. Most of those covering fields emphasized at UMC may be found here.

Government Documents. The library has been a repository for federal documents since the turn of the century and has a comprehensive collection of older as well as recent government publications. A depository system for Missouri documents was set up in 1976 with the UMC

library designated as a depository library. Selected Missouri documents prior to 1976 are also available. The library receives microprint copies of all federal and United Nations publications. Major documentary publications of foreign nations are also available (e.g. Journals of the House of Lords and House of Commons, Journal Officiel de la Republique Francasie, etc.) These collections contain over 300,000 pieces. (Government Documents area is located on second floor east, Ellis.)

LIBRARY SERVICES. Reference and Inter-library Loan. Librarians who are bibliographic specialists can aid graduate students in research. Their services include the location of printed and manuscript materials in other libraries in the United States or abroad and the acquisition of photo or microfilm copies of scarce items which cannot be secured in any other form.

UMC Library is a member of the Center for Research Libraries of Chicago, through which the member libraries store and/or acquire cooperatively lesser-used research materials, including foreign newspapers on microfilm.

On-line Search Service. The UMC Libraries offer on-line literature searches of computerized data bases. The data bases are computer-readable versions of indexes and abstracting services. The result of an on-line search is a bibliography tailored to the researcher's topic. The libraries have access to over one hundred data bases in virtually all subject fields. The data bases include material from journals, books, conference papers, reports, government documents and other sources. The libraries must provide searches on a partial cost recovery basis. This means the patron will pay for the direct costs of the search, and the library will assume most overhead costs.

Reserve and Seminars. Some reading materials for class assignments may be placed at the reserve desk (first floor west, room 109) or in seminar rooms located in several area libraries. This is done at the request of the course instructor.

Library Instruction. Specialized library instruction sessions for graduate students are conducted by librarians who have knowledge of bibliographic resources in specific disciplines. These instruction sessions are conducted at the request of instructors.

Services for the Handicapped. The entrance to the main library on Conley Avenue is accessible to handicapped students. Library services for those with special needs are available from the coordinator of Library Services for the Disabled, located fourth floor east.

LIBRARY FACILITIES. Ellis Library provides seating for 1,500 readers. For the use of qualifying graduate students there are 76 carrels. There are 264 individual book lockers available for any

student. Nine seminar rooms, each seating 10 to 14 people, are available for specialized graduate study. Many types of microfilm and microfiche readers (fourth floor west) are available to the student. The library also maintains photocopy equipment (second floor center) with which, for a small fee, copies may be made of most library materials.

Current Periodical Reading Room (first floor west). Unbound issues of most periodicals received in Ellis (approximately 6,000) are shelved in this area. Bound volumes are in the subject area stacks. Copy machines are also available in this area.

In addition to Ellis Library there are nine branch libraries:

Engineering	2017 Engineering
Geology	201 Geology
Health Sciences	M210 Medical Sciences
Journalism	117 Walter Williams
Library Annex	312 South Ninth
Mathematics	206 Math Sciences
Newspaper Reference	131 Neff Hall
Research Park	132 Dalton Research Center
Veterinary Medical	W218 Veterinary Medicine

Except for the Library Annex and the Newspaper Reference Library, each branch has a collection of books and periodicals relating to the discipline it serves. A staff is available to offer the services of circulation, reserve reading, reference and information, on-line searching, inter-library loan, tours and lectures on bibliographic resources and, in some cases, photocopy equipment.

THE ENGINEERING LIBRARY contains 56,425 volumes and currently receives 544 periodicals. Its collection encompasses chemical, civil, electrical, industrial, nuclear and, to some extent, agricultural engineering materials.

THE GEOLOGY LIBRARY receives 289 current periodicals, has a collection of 36,737 volumes and 90,000 maps covering all aspects of geology.

THE HEALTH SCIENCES LIBRARY collects materials on medicine, nursing, health services management and paramedical fields with a collection of 189,470 books and receives 1,810 current periodicals.

THE JOURNALISM LIBRARY receives 398 current periodicals, and its collection of 19,638 volumes covers mass communications, advertising, magazines, graphics and public relations.

THE MATHEMATICS LIBRARY collects materials dealing with mathematics, statistics and computer science. It receives 374 current periodicals and has 25,057 volumes.

THE RESEARCH PARK LIBRARY, interdisciplinary in nature, collects publications primarily in the life sciences, nuclear engineering and research reactor, and has an extensive collection of energy research agency publications. It receives 60 periodicals and has 2,618 volumes in its collection.

THE VETERINARY MEDICAL LIBRARY receives 643 periodicals and has a collection of 30,768 volumes.

THE LIBRARY ANNEX is used as a storage facility for materials from the main library and its branches. The annex is not merely a storage area, but it is staffed to assist students in locating materials. Hours are posted at Ellis.

THE NEWSPAPER REFERENCE LIBRARY consists of a collection of clippings and photographs used in the composition of *The Columbia Missourian* and *The Columbia Daily Tribune*.

The Library of the State Historical Society and Other Special Collections. The State Historical Society Library, which shares the Ellis Library building, has an extensive collection of Missouriiana and of the early West. This collection comprises 480,000 volumes, including 2,575 bound volumes of Missouri newspapers and 10,000 bound volumes of Missouri magazines and college periodicals; 5,200 items in the J. Christian Bay rare book collection of the society; 225,000 volumes of Missouri official publications; 26,200,000 pages of Missouri newspapers on positive microfilm; 500,000 pages of original manuscripts; 4,293 rolls of United States Census covering Missouri and 46 other states; 1,500,000 pages of manuscripts on microfilm; 150,000 items of Missouri state archives; more than 82,000 engravings, lithographs, paintings, photographs, pictures, portraits and original drawings of cartoons; and 90,000 maps, scrapbooks, and World War I and 11 letters, records and clippings.

The Western Historical Manuscript Collection, established in 1943 with the assistance of the Humanities Division of the Rockefeller Foundation, was consolidated in 1962 with the State Historical Society's Manuscripts as a Joint Collection. In 1968 it became a university-wide operation, and now occupies divisions in the libraries of the four campuses of the University. Materials may be loaned among the four divisions.

The primary objective of the Collection is the acquisition and preservation of letters, diaries, and other personal and business papers as well as the organizational records pertaining to all of the history of Missouri.

The Western Americana Collection features material on Missourians and the Great Plains. Similar general boundaries have been set up for the manuscript collection. The book collection naturally spills over to follow the Oregon and Santa Fe Trails and the westward movement to California. Missouri's part in the development of the West brings much of Western historical materials within the field of Missouriiana and ties the State closely with nearly all phases of the early history of the West. The collection has been developed in close connection with the library of the State Historical Society, which is especially strong in Western materials, so that duplication has been held to a minimum. In 1941 the Society acquired the Bay Collection of

Western Americana comprising 2,900 volumes, containing many of the rarest printed items relating to the West. The society's library is also noted for its outstanding collections of the works of Mark Twain and Eugene Field.

Ellis Library acquired a special collection of about 1,000 volumes of Western Americana in 1940, bringing its holdings in this field to about 6,000 volumes. Several hundred volumes a year have been added. The libraries of the University and the State Historical Society contain original or film copies of a large percentage of the important titles relating to the West. The collections are especially rich in travel narratives and contemporary accounts of life among the pioneers. They also contain some unusual Indian items.

COMPUTING FACILITIES

The Academic Computing Center (ACC) provides educational and research computing services to the University community. The ACC operates remote computing facilities in Lefevre Hall (open 24 hours), Electrical Engineering, Middlebush, and the General Classroom Building. These facilities are available to graduate students for work on assigned educational problems and on dissertation research. The ACC offers free, non-credit seminars and short courses to graduate students, faculty, and staff and provides error analysis consultation.

The Columbia campus derives its computing resource from the University of Missouri-Computer Network which operates an Amdahl 470V/8 and an Amdahl 470V/7. In addition, departments and divisions maintain specialized mini-computers, microcomputers, and other computer-based support facilities, including the Advanced Automation Group, the Advanced Computer Engineering Services Center, the Electronic Instrument Laboratory, the Engineering Electronic Advanced Instrumentation Design Group, the Geographic Resources Center, the University of Missouri-Columbia libraries, the Department of Informational Science, the Missouri Testing and Evaluation Service, and the Research Center, College of B & PA. Each terminal is hooked up to a large mainframe computer, providing increased capabilities and access. Students enrolled in computing courses have access to more than 200 terminals located at the sites across campus.

The microcomputers and software libraries located at the sites are available to all students. McIntosh and IBM personal computers are available in Ellis Library, where there is also a computerized card catalog that may be accessed from any campus terminal.

All computer sites except those located in residence halls are staffed by user consultants who answer questions, help with equipment problems and provide

security. Residence hall sites are equipped with telephones allowing students to call a campus expert with questions. User manuals also are shelved at the sites.

Students interested in buying personal computer equipment may take advantage of University sponsored educational discounts. Computer services personnel help students determine the best equipment for their specific needs and budget.

MUSEUMS AND COLLECTIONS

MUSEUM OF ART AND ARCHAEOLOGY. The museum's exhibition hall is on the second floor of Pickard Hall on the Francis Quadrangle. The collections include more than 8,000 art objects, representative of all parts of the world and all periods from paleolithic to the present. The collections of greatest strength are in ancient art and archaeology of the Near East, Egypt, Greece and Rome; Oceanic, African and pre-Columbian art; old master paintings (with the Kress Study Collection as its core); South and Southeast Asian art, drawings and prints. There are small collections of Chinese and Japanese and early Christian (Coptic and Byzantine) art. A large amount of material from the museum's excavations at Tel Anafa in Upper Galilee is available for students of archaeology. The museum, whose director is Forrest McGill, publishes *Muse*, the annual magazine of the Museum of Art and Archaeology, which includes articles about objects in the museum by staff, faculty, students and scholars from outside the University.

The Gallery of Casts of Greek and Roman sculpture, exhibiting some 50 full-size plaster copies of many of the most famous classical statues, is on the first floor of Pickard Hall.

ANTHROPOLOGY MUSEUM. Open 9:30 a.m.-12 noon and 1-5:00 p.m. Tuesday through Friday, 9-1 Saturday during school sessions, the museum gallery in 100 Swallow Hall contains collections of American Indian archaeological and ethnological materials, as well as anthropological specimens from other areas of the world. Also, the Division of American Archaeology and the Missouri Archaeological Survey exhibit some of their findings concerning the archaeology of Missouri and surrounding areas in Schweitzer Hall. The museum displays several exhibits on the second floor of Jesse Hall changing periodically.

The museum publishes the *Museum Briefs Series* and other occasional papers.

ENTOMOLOGY MUSEUM. The collections of several hundred thousand specimens, housed in the Agriculture Building, are primarily for research and teaching. A partial collection is on exhibit for museum visitors or by appointment. The holdings consist mainly of insects, mites and spiders. This is the largest

collection of Arthropoda in Missouri. The museum director is Thomas R. Yonke (882-2410 or 882-7894 for appointment).

GEOLOGY MUSEUM. Among the more than 100,000 specimens in the museum are the invertebrate collections, rich in fossils of Devonian, Mississippian and Pennsylvanian rocks of Missouri and the midcontinent; the vertebrate collections, largely of Pleistocene mammals; the collection of conodonts, the most varied and nearly complete of its kind in the world; the collections of fossil Charophytes, representing all known localities in North America and containing reference material from South America, Europe, Asia and Africa. The paleontologic collections of the Missouri Geological Survey are also located here.

The mineral collections contain one of the most complete aggregate of materials from the famous Crestmore locality in California, many of them in crystal form; one of the finest collections of boron minerals in this country, a fine set of garnets; and many excellent crystals from the lead and zinc mines of southwest Missouri. The clay mineral collections contain a complete set of A.P.A. reference clay minerals, as well as type clay minerals from most of the important clay deposits of the world.

More than 1,800 species are represented in the Dana Collection. The DeMuth collection contains especially fine specimens of polished fossil woods. The curator of the paleontological collections is James H. Stitt; the curator of the mineralogical collections is Alden B. Carpenter.

THE HERBARIUM. The plant collection in 226 Tucker Hall is valuable for research conducted by students and professionals. Samples of rare and endangered species are maintained and locations are recorded. Teaching materials include a general collection, primarily of North America, but also including material from South America, Australia, Asia and Africa. Tropical and subtropical material from Central America includes nearly 30,000 specimens. Areas of specialization include desert ecology, agrostology, and the genera *Crataegus*, *Lupinus* and *Quercus*.

The collections of about 250,000 specimens include nearly 35,000 mycological specimens, 15,000 paleobotanical specimens, 1,000 algal specimens, and about 30,000 specimens still not processed. The entire private collection, some 70,000 specimens, of Ernest J. Palmer, a noted authority in the genera *Crataegus* and *Quercus*, was willed to the University. The herbarium curator is David B. Dunn. Joseph M. Wood is the paleobotanist; Charles S. Gowans the phycologist; and Clair L. Kucera the agrostologist. The mycological collection is now housed in Waters, first floor; Oscar Calvert is curator.

FISHERY & WILDLIFE COLLECTIONS. The School of Forestry, Fisheries, and Wildlife maintains an extensive teach-

ing and research collection of the vertebrate animals of Missouri and surrounding states. The bird and mammal collections in Stephens Hall (both skins and skulls) are curated by William H. Elder. The Glen Smart waterfowl collection,

consisting of more than 200 species of mounted waterfowl of the world, is on display in the lower corridor of LeFevre Hall.

Curated by Dr. Arthur Witt Jr., the freshwater and saltwater fish collection

in Stephens Hall contains some 25,000 preserved specimens, including fishes from Missouri and the Midwest; saltwater fishes from the Atlantic, Pacific and Gulf coasts; and about 3,000 freshwater and saltwater fishes from Thailand.



RESEARCH CENTERS AND RESOURCES

CENTER FOR RESEARCH IN SOCIAL BEHAVIOR

The Center for Research in Social Behavior is a research and training facility operated by members of the social science faculty on the UMC campus. It was established in 1966 to incorporate the activities of an earlier, less formally constituted, social psychology laboratory. The center is supported by research contracts and grants, and by state funds administered through the Graduate School.

The goal of the center is to conduct and to promote social science research at the University. The center provides facilities, equipment, office accommodations and services needed in programs of field and laboratory investigation; maintains a social environment in which research and graduate training in the social sciences are facilitated; and sponsors lectures, seminars and visits from scholars in the social sciences from this and other campuses.

B&PA RESEARCH PROGRAMS

The College of Business and Public Administration's facilities and resources for research promote both individual and team projects in the subject areas of regional economic analysis, decision-making processes, judicial and legislative processes, organization and administration, consumer behavior, forecasting, operations analysis, population and manpower studies, urban affairs, and state and local fiscal analysis. The college maintains close relations with university research groups throughout the nation through memberships in the Associated University Bureaus of Business and Economic Research, Public Affairs Administration Research Section of the National Association of Schools of Public Affairs

and Administration, the National Tax Association, and disciplinary associations.

Public Affairs Information Service is a computer-based research support facility of the College of Business and Public Administration at UMC. PAIS provides data and data management services, data analysis, software development, consultation on data applications, statistical analysis and instruction in the use of various data sets and associated retrieval software to University faculty, staff and students; federal, state and local government agencies; private enterprises and the public. In addition, PAIS maintains a large and varied data base of financial, economic and demographic information describing characteristics of the nation, the states and their subdivisions. Major data holdings include the 1980 Census, Bureau of Economic Analysis Regional Economic Information System, Missouri Economic Information Retrieval System, National Bureau of Economic Research Time Series Data Bank and COMPUSTAT. Much of these data pertain to Missouri and the Midwest. Technical assistance is available on a contractual basis at cost to research organizations or individual researchers.

The Administrative Behavior and Survey Research Laboratory. This facility underscores the importance of having available a behavioral laboratory as a necessary condition for rigorous and scientific inquiry into the behavioral dimension of administration. The College of Business and Public Administration established the Administrative Behavior and Survey Research Laboratory in 1974. The laboratory, used for research and instructional activities, is equipped with a complete audio-video tape system and observation booths, which permit a wide variety of experimentation on individual and small group activities such as decision making, problem solving, conflict resolution and communication.

THE FREEDOM OF INFORMATION CENTER

The Freedom of Information Center in Walter Williams Hall of the School of Journalism maintains day-to-day studies of actions by government, media and society affecting the movement and content of information. Results of the center's studies are published either in a monthly report series or a bi-monthly newsletter. Approximately 2,000 newspapers, broadcast stations, libraries and scholars receive these publications.

UNIVERSITY PRESS

The University of Missouri Press, 200 Lewis Hall, publishes 25 scholarly books per year. Submissions are accepted from scholars across the nation. The press specializes in the subject areas of literary criticism, history, regional studies, art, art history, and original poetry and short fiction.

PHYSICAL AND BIOLOGICAL SCIENCES

UMC has excellent resources in equipment and services to support research in the natural sciences. Most of these facilities are related to individual departmental and area programs described in listings elsewhere in this catalog.

DALTON RESEARCH CENTER

The John M. Dalton Research Center is a multidisciplinary facility devoted to basic health sciences related research and to graduate and postgraduate training. Housed in Research Park, just south of the main campus, the center has facilities for modern research in physiological, biochemical and bioengineering studies. Research programs in the center are directed toward problems in cardiovascu-

lar control and physiology and related instrumentation; biochemical studies of the mechanism of cellular toxicity of oxygen and the superoxides; studies of the cyclic nucleotides and their role in cellular function, peritoneal dialysis for patients with kidney disease; biocompatible materials; basic research in biomedical ultrasonics and in mammalian cell genetics and the role of mutagenic and carcinogenic agents. The center contributes to the University by serving as a nucleus for collaborative studies drawing upon the expertise and talents of faculty from medicine, veterinary medicine, arts and science and engineering. Support for much of the center's activities comes from grants and contracts from federal, state and industrial agencies.

SINCLAIR RESEARCH FARM

The Sinclair Research Farm, a University-wide facility aiding research on aging and chronic disease, is designed to house and care for farm and laboratory animals under controlled conditions.

In the past, most biological research information has come from work with the smaller, shorter-lived animals. At the Sinclair Research Farm, research also is conducted using longer-lived animals which have organ systems, basic food requirements, societal stresses and diseases similar to those in humans.

Examples of research at the Sinclair Farm include alcoholism, atherosclerosis, diabetes, cancer, immunological response to under-nutrition, diseases and aging, toxicology, hemophilia, nutritional studies and others.

The farm is located on 563 acres just outside the city and adjacent to the Columbia campus.

COLLEGE OF AGRICULTURE RESEARCH FARMS

The Agricultural Experiment Station has a number of unique facilities which are used to conduct pilot field and systems management experiments under the varying climatic conditions and the natural resources found in the state. The facilities, which are part of the Columbia campus, include the world famous Sanborn Field, which provides continuous records of the changes occurring since 1888 under various cropping programs. Aureomycin was discovered in the soil on Plot 23. The Agricultural Research Park was developed to provide the facilities to conduct experiments under controlled environmental conditions.

Nine facilities are operated in the area adjacent to Columbia. These include the Ashland Wildlife Area, South Farms, Foremost Dairy Farms, Rocheford Turkey Farm, Horticulture Farm, Claypan Research Field (McCredie), Bradford Agronomy Center, Schnabel Arboretum and Demonstration Woods, and Hinkson Bot-

Special units designed for coordinated research programs can be established. Specialized facilities within the state are available at the off-campus research centers:

The Delta Center at Portageville is the home for extensive research on plant breeding, variety testing, weed control, soil fertility, insect control and irrigation. Chief crops studied on the 975-acre site include cotton, soybeans, corn, grain sorghum, wheat and barley. Horticultural researchers are breeding tomato varieties adapted to the Midwest, and forestry researchers are experimenting with cottonwood trees as a commercial pulpwood crop for the Delta.

The Forage Systems Research Center near Linneus contains 1,200 acres of rolling land typical of much of northern Missouri. Research at the center is under the direction of the University of Missouri-Columbia's Forage Systems Research Center Management Committee.

The Lee Greenley Jr., Memorial Center at Novelty includes 700 acres and is designed to emphasize research on energy conservation in agriculture.

The North Missouri Center is located seven miles west of Spickard in Grundy County. Soils on the farm represent about 7,500 square miles or 4,780,000 acres of the north central region of northern Missouri.

The Southwest Missouri Center at Mount Vernon includes 898 acres. Activities at the center are aimed at helping the area's dairy and livestock economy.

The University Forest is located 14 miles north of Poplar Bluff and comprises 7,310 acres, almost all forested in upland hardwood cover types and some shortleaf pine. Twenty-two buildings house research laboratories, greenhouse, sawmill, wood processing plant, office, shops, resident forester's house, classroom, student and faculty cabins, and dining hall.

COLLEGE OF VETERINARY MEDICINE RESEARCH FARM

The 90-acre veterinary medical research farm, located within a 15-minute drive of the UMC campus, has pasture and other facilities for holding several species of domestic and companion animals for research.

Research emphasizes improving health and productivity of domestic livestock and poultry, preventing disease epidemics, minimizing losses due to sicknesses and disease of livestock, protecting human health through control of animal diseases transmissible to humans, and improving the health of companion animals.

RESEARCH REACTOR

The University of Missouri's Research Reactor, located in the Research Park one mile south of the Columbia campus, is

the most powerful, highest flux university research reactor in the U.S.A. Known by its call letters MURR, the facility provides intense sources of neutron, gamma, and neutrino radiation for research and technical applications. The facility complements other radiation sources such as X-rays, infrared and ultraviolet light, and ultrasound, to provide academic researchers a complete set of diagnostic capabilities. Experimenters from more than two dozen departments conduct research at the reactor. The facility is also available to researchers from other universities and from government and industry.

Examples of research conducted using the reactor are: making a Cd/In-115m radioisotope medical generator to be used to detect laminitis in horses, using neutron activation as a detector to trace prehistoric trade routes in Mexico, scattering neutrons from the tungsten carbide teeth of oil well drilling bits to determine why they wear out, measuring the gravitational and Coriolis effects on the neutron using a neutron interferometer, an engineering analysis of the thermohydraulics of the reactor using new codes. The reactor supports about 185 research projects by 125 faculty and 75 graduate students from 25 departments of the University.

THE LOW LEVEL RADIATION LABORATORY

The Low Level Radiation Laboratory, located in Agricultural Research Park and operated by the College of Agriculture, houses a large whole body liquid scintillation counter. This unique facility, shielded in a large steel chamber, is capable of detecting minute amounts of naturally occurring radiation in animals and man, as well as detecting very low levels of isotopes that may be administered to a subject on an experimental program. Facilities are available for monitoring human babies, as well as adults, and animals ranging in size from small laboratory animals up to 600 kilogram farm animals.

ELECTRONIC INSTRUMENT SHOP

This versatile facility is housed in the Physics Building and allows a capability of designing, building and maintaining complex electronic equipment. The staff consults with research personnel concerning problems associated with instrumentation.

SCIENCE INSTRUMENT SHOP

The University campus offers machine-tooling capability of various metals and the ability to design and fabricate housings for instruments. This shop contains

lathes, cutting tools and die presses and the expertise to custom-build many types of instrumentation.

MISSOURI CULTURAL HERITAGE CENTER

The Missouri Cultural Heritage Center was created in 1981 to provide a focal point for multidisciplinary research projects, curriculum development, and out-

reach programs that attend to the vital sphere of cultural studies in the state and region. The center provides coordinative leadership and serves as a clearing house for cooperative projects on the UMC campus, and it facilitates multidisciplinary and integrative work. The center stresses service to both campus and the wider community and encourages research efforts that yield versatile end-products for broad audiences such as

teacher workshops, town meetings, exhibitions, curriculum enrichment in the schools, public programs and various publications. Through its activities, the center seeks to document, conserve, interpret and present the rich heritage of the state and region in order to achieve a more comprehensive record of cultural life. It is the ambition of the University to foster a deeper understanding and appreciation of our own cultural history.



REGISTRATION, FEES AND STUDENT SERVICES

REGISTRATION PROCEDURES, FEES AND EXPENSES

Potential students who qualify for admission and who have submitted an application fee are issued registration materials. Students may pick up registration materials in the Graduate School. An application for admission and all transcripts must be on file not later than August 1 for students who enter the fall semester, December 1 for the winter semester, and May 1 for summer session.

Registration materials for the next semester are made automatically for students enrolled in UMC during the previous semester. Graduate students who are enrolled for the winter semester or for the previous summer session automatically are issued registration materials for the summer session.

Enrolled students may complete registration for the upcoming semester during the pre-registration periods, usually held in October and April. New students may register in advance for the fall semester during the advance registration period in June and July.

APPLICATION FEE. All potential students are required to submit a fee along with their application form. This fee is as follows:

U.S. Citizen	\$20.00
International Students	\$50.00

This payment is nonrefundable but may be used as partial payment of fees if the student enrolls at UMC within one academic year following payment. The fee for international students is based on the higher cost of processing these applications.

INCIDENTAL FEES. All students must pay an incidental fee of \$63.15 per credit hour (up to \$884.10 per semester) which includes laboratory fees, library privileges and limited health services. In addition, non-resident students must pay a tuition of \$108.00 per credit hour (up to \$1,512 per semester).

Non-resident tuition must be paid if the student has not been a resident of Missouri for one year immediately prior to registration. There are some exceptions to this rule which are explained in the Tuition and Residence Rules brochure, available at the admission's office, 130 Jesse.

STUDENT ACTIVITIES FEE. Students registered for resident work on the Columbia campus are required to pay a student activities fee, based on credit hours, with a maximum of \$39 during regular semesters and \$19.50 in the summer session.

This \$39 student activities fee is allocated to the following: Memorial Union bond retirement, \$11.50; Warren E. Hearnes Multipurpose Building bond retirement, \$4; Missouri Students Association Student Activities, \$9; Divisional Student Council Activities, \$1; Student Activities capital improvements, \$4; Associated Students of the University, \$1.50; intramural program, \$3; and transportation, \$5.

No fee of more than the \$39 is charged (1) if the student is enrolled simultaneously in a session or semester and in a special intersession, (2) during the period beginning with the close of regular summer session and ending with the beginning of the fall registration, or (3) if the student is enrolled in courses which are

offered off-campus.

HOUSING (1985-86). Housing charges are based on one-half of a double room in a UMC residence hall, 20 meals per week in the academic year (no Sunday evening meal) and \$15 social fee. Students are not required to live in residence halls. Housing fees are refunded according to the housing contract. Costs are: Academic Year, \$2,111; 8-week summer session, \$502; and 4-week summer session, \$251 (the summer sessions include 15 meals per week, with no meals served Saturday or Sunday.)

LATE REGISTRATION FEE. A late registration fee is charged if students do not complete registration by the last day of regular registration.

TIME & METHOD OF PAYMENT. Fees must be paid during registration as a condition of admission to classes. Students who pre-register must pay fees by the announced deadline or the advance registration will be cancelled, and the student will be required to register again during regular registration.

Fees for room and board may be paid in one payment for the entire year, one payment each semester or four payments each semester.

Personal Checks in payment of fees or other obligations to the University are accepted only for the amount due. Students whose checks remain unpaid after they have been notified are reported to the Office of the Vice Chancellor for Student Affairs for disciplinary action. If the check must be turned over to the general counsel's office for collection, a service charge is assessed.

A student whose check for student fees is returned unpaid and remains un-

FEES & EXPENSES 1985-86

All fee statements are announcements only and are not to be regarded as offers to contract. The University of Missouri-Columbia reserves the right to change any and all fees at any time.

To determine your fees, go through this list and add all the fees that apply to you.

	16 week semester		8 week session	
	1-13 hours	14 or more hours	1-6 hours	7 or more hours

INCIDENTAL FEE

All students must pay an incidental fee which includes laboratory fees, library privileges, health services.

Graduate Students	\$63.15 per hour	\$884.10	\$63.15 per hour	\$442.05
-------------------	------------------	----------	------------------	----------

NON-RESIDENT TUITION

You must pay non-resident tuition if you have not been a resident for at least a year immediately prior to the time you first register. There are some exceptions to this rule. Check the Tuition and Residence Rules brochure, available at the Cashier's Office, 123 Jesse Hall.

	1-11 hours	12 or more hours	1-5 hours	6 or more hours
Graduate Students	\$108 per hour	\$1,512	\$108 per hour	\$756

STUDENT ACTIVITIES FEE

All students are required to pay a student activities fees which includes student government, student activities, programs, guest lectures, etc. Tickets for UMC athletic events are not included.

All Students	\$3.25 per hour	\$39.00	\$3.25 per hour	\$19.50
--------------	-----------------	---------	-----------------	---------

REFUND OF FEES. If a student leaves the University or drops a course, a formal request must be filed with the Graduate School. Refunds will be paid, with some exceptions, according to the schedule at the bottom of this page. For any session other than these, the refund will be calculated in the same way. Deductions may be made from the refund for any money owed the University.

	FULL REFUND	90%	70%	50%	NONE
16 week semester classes	Before classes begin (less \$20. for the cost of handling registration)	During 1st through 5th day of classes	During 6th through 10th day of classes	During 11th through 25th day of classes	After 25th day of classes
8 week session	Before classes begin (less \$20. for the cost of handling registration)	During 1st through 3rd day of classes	During 4th through 5th day of classes	During 6th through 10th day of classes	After 10th day of classes

paid after the close of the regular registration period is considered a late registrant and is subject to the late registration fee.

Credit Cards (MasterCard and VISA) are acceptable toward payment of fees to the credit limit of the cardholder.

Deferred Payment of Incidental Fees. Graduate assistants employed at a level of .25 Full Time Equivalent (FTE) or more qualify for deferral of the incidental fee. Under this program, a service charge of \$15 and the Student Activity Fee are paid at the normal payment deadline date for pre-registered students or at regular registration. The incidental fee is paid in three installments on dates specified by the Graduate School. This plan is not implemented automatically; graduate students must request deferred payment from the Graduate School. Graduate assistants receiving other financial aid are not eligible except on approval of the Office of Financial Aids. The plan is

not to be implemented for summer sessions, intersessions or other special sessions. For more information, contact the Graduate School.

SUPPLEMENTAL FEES. Vehicle Registration. Every student who owns or operates a motor vehicle must register the vehicle at no charge, or purchase a paid parking permit, depending upon the individual circumstances. Permits are required for all campus parking lots and may be purchased at Parking Operations. Motorcycle registration, at no charge, is mandatory. UMC residence hall students wishing to park adjacent to their units must obtain permits from the Residential Life Office, 125 Jesse Hall, at the date and time specified on the bulletin board posted in the residence halls. Further information about parking regulations may be obtained at Parking Operations, 107 Swallow Hall.

Hood Fee. Those granted PhD or EdD

degrees may purchase hoods for a \$25.00 fee.

Diplomas held for delinquent indebtedness. A student is required to clear all delinquent indebtedness to the University before a diploma may be released or transcript issued.

Laboratory breakages. Breakage or loss of laboratory equipment due to personal negligence is assessed against the student when the actual value of the supplies exceeds \$1. The amount of this charge is determined by the department chairperson.

NONRESIDENT TUITION. Tuition is not charged to (1) any permanent resident, that is any person who has been a resident of Missouri for at least one year prior to registration; (2) nonresident graduate students who are graduate teaching or research assistants on at least a 25 percent full-time equivalent appointment; and (3) nonresident graduate students

holding a fellowship which does not include payment of tuition. Prospective graduate students who believe that any of the above categories applies in their specific cases may contact the Graduate School or cashier's to determine the fees.

Non-resident tuition is waived for a student who is a full-time staff member of this University or is the unmarried minor child or spouse of such a staff member; however, incidental fees are charged to all students. For details, see *Tuition and Residence Rules* available from admissions, 130 Jesse, or refer to rule 7.06303 of the Collected Rules and Regulations of the University.

Each student is responsible for registering under the proper residence and paying proper tuition and fees.

FULL-TIME EMPLOYEES. University employees should check with their supervisors or the Graduate School for information on educational benefits.

INTERSTATE RECIPROCITY AGREEMENT. By joint agreement of the Board of Curators of the University of Missouri and the Board of Regents of the University of Nebraska, qualified Missouri residents may enroll in graduate programs in Nebraska and be charged at the rate paid by Nebraska resident students. Conversely, qualified Nebraska resident students may enroll in graduate programs on one of the campuses of the University of Missouri and be charged fees at the rate paid by Missouri resident students.

For further information regarding this agreement contact the Admissions Office, 130 Jesse.

PETITIONING INTO OR OUT OF A COURSE. The student's advisor and the graduate dean must approve a petition to withdraw from one course or enter another. Petition forms and instructions are available in the Graduate School. Only under extenuating circumstances may a student enter a course after six class meetings.

No grade is assigned to a student who ceases, for any reason, to be a member of a course prior to the beginning of the seventh week of a semester, or an proportionate period of time in a summer session. A student who officially withdraws from a course after the beginning of the seventh week and who is doing failing work is assigned the grade WF. If the quality of the student's work is not judged to be failing at the time of withdrawal, the instructor may assign a grade of W.

Current regulations and time schedules for petitioning, withdrawing, changing status of enrollment are included in the *Schedule of Courses* each semester or session.

ENROLLMENT REQUIREMENTS AND RESTRICTIONS. Students working toward advanced degrees are required to enroll in the Graduate School not only for courses which are part of the advanced degree program but also for under-

graduate courses which carry no graduate credit and for those courses which a graduate student may be taking as a hearer. This requirement includes those seniors who are enrolled concurrently in an undergraduate college and in the Graduate School, and who wish to receive graduate credit for part of their programs. Enrollment is expected to reflect the course work and research in which students are engaged.

Unless special permission of the graduate dean is secured, the maximum credit hours in Graduate School is 16 hours per semester or 8 credit hours for the summer session.

HEARING (AUDIT) COURSES. Students who enroll merely to attend lectures, are expected to enroll and pay fees as a "hearer." The status of hearer does not entitle a veteran to a subsistence allowance.

WITHDRAWAL. Formal withdrawal from UMC is arranged through the Graduate School. Students who leave the Columbia campus without filing a statement of formal withdrawal are given a failing grade of F in all courses. If the reason is so urgent that an official withdrawal cannot be obtained, the student should notify the graduate dean as soon as possible and officially request to be withdrawn.

If the student is making a C or better at that time, a grade of W is recorded. If the student is making an F at the time, a grade of WF is recorded. Students are responsible for notifying their instructors of their intention to withdraw and for determining if their work qualifies them for a W grade.

Courses taken as a hearer will be counted at their normal credit value in computing the amount of fees to be paid. Students enrolling in zero-credit courses are required to pay fees according to the number of hours of instruction.

Master's degree candidates who have completed, in a previous semester or term, all requirements but the final examination and the submission to the graduate faculty of a thesis (if required), must be enrolled in the Graduate School when the examination is given or the thesis read. Such students must enroll for examination for no credit hours and pay a fee of \$63.15. Students who enroll under this rule are not entitled to Student Health Service benefits.

HOUSING. All students may reside in any available housing they choose, either University-supervised housing or off-campus housing. Students interested in University-owned housing may request information by writing Residential Life, 123 Jesse Hall. There are contractual rules the students must follow and deadlines for housing deposits. Single student housing applications/brochures are available in February by request. Family student housing brochures and applications are available throughout the year.

University-owned residence halls are available to undergraduate and graduate students. Students enter into contracts with UMC for accommodations in University residence halls on a room and board basis for the academic year. The current rate for one half of a double room and 20 meals per week is \$2,111 per academic year. Payments may be made in installments.

Mark Twain Resident Hall, 515 South Fifth Street, is air-conditioned and is divided to house both men and women. The current rate for room and board (excluding taxes) is \$2,969 for the academic year. The owners operate this facility under the general supervision of the residential life office and in accordance with the rules and regulations governing University-owned housing. However, contractual arrangements regarding residence are entered into between students and the hall owners; the University does not take part in these contractual arrangements. Address inquiries to Mark Twain Residence Hall; do not submit application-contracts for accommodations in University-owned residence halls.

Family Student Housing. UMC has 360 unfurnished apartments for married students and single parents. Although floor plans vary, all apartments include living room, kitchen, bath, and one or two bedrooms. All are unfurnished except for stoves and refrigerators. All utilities are paid by the residents. One-bedroom apartments rent for \$157 per month; two-bedroom apartments for \$179 per month.

Off-campus Housing. Some operators of off-campus housing list their available rooms and apartments with Residential Life, where a listing may be obtained. However, the University does not serve as a rental agency for these accommodations. Residential Life does not inspect or approve off-campus housing and assumes no responsibility for the accuracy of information given. It should not be assumed that accommodations listed are considered to be more desirable than those that have not been listed.

Most students find that a trip to Columbia well in advance of the date housing is required will aid them in making most satisfactory arrangements. Since listings of off-campus housing are frequently amended, the lists are not made available by telephone or by mail.

STUDENT SERVICES

The vice chancellor for student affairs office, 211 Jesse Hall, provides administrative support and supervision over the six student services departments: Residential Life, Student Development, Counseling Services, Student Health Services, Memorial Union/Brady Commons and Financial Aid. Student services office exists as an academic support unit of the institution. It is dedicated to actively influencing the University environment

and contributing to the total education of UMC students.

DISABLED STUDENTS. The Access Office, 126 Gentry Hall, coordinates special services available to disabled students. These include wheelchair repair, a study center with audio tape materials and vision aids, special lift-equipped buses, and modified physical education courses. The program works with various services on campus to increase accessibility and enable disabled students to participate in regular student activities and student life.

INTERNATIONAL STUDENTS. The Office of International Student Programs, 114 Read Hall, provides special services for international students including advice about legal immigration status. The office coordinates cultural and educational programs and advises international student organizations.

VETERANS. The Office of Special Services, 221 Jesse Hall, provides G.I. Bill information and certification for eligible veterans and dependents. The office also furnishes information on military service educational assistance programs.

HEALTH SERVICE. Access to medical care is available at the Student Health Service outpatient clinic, staffed by eight physicians and located west of the columns between Francis Quadrangle and South Sixth Street. Low cost charges are made for services and students may be seen without an appointment. Services of special clinics in gynecology, orthopedics, allergy, immunizations, ENT and psychiatry are available by appointment. Laboratory, X-ray and pharmacy services are also available. Clinic hours are 8 a.m. to 5 p.m. Monday through Friday. Emergency care is available at the University Hospital and Clinics Emergency Room, where students are responsible for all costs of medical care.

SUPPLEMENTAL PLAN FOR SICKNESS AND ACCIDENT INSURANCE. This plan, which may be purchased at the time of enrollment, is sponsored by the University of Missouri. Obtainable at a reasonable cost, the plan covers a student's needs for hospitalization and surgery, including medical and surgical treatment while away during weekends, holidays and summer vacations. The plan does not cover charges for medications. There is limited payment for outpatient laboratory and X-ray services. Insurance also may be purchased at an extra cost to cover spouse and dependents. Details are available at the cashier's office.

MINORITY STUDENTS. The Minority Student Office, 103 Read Hall, provides academic and personal counseling for members of minority groups and sponsors a series of programs to encourage a sense of community within UMC. A calendar of events and activities is published each semester.

GRADUATE STUDENT AFFAIRS OFFICE. The Graduate School implement-

ed the Graduate Student Affairs Office in August 1979. The office was created to increase the enrollment of minority, women and handicapped graduate students and is administered by the Graduate School and Office of Research. This office works in cooperation with directors of graduate studies in the departments. The major goal of this office is to increase the enrollment and reduce attrition of minority, women and handicapped students particularly in underrepresented departments consistent with the affirmative action goals of the University of Missouri-Columbia.

The objectives of the Graduate Student Affairs Office are:

- identify minority, women and handicapped students who have the interest and potential for graduate studies;
- enhance such individuals' awareness of program offerings and career opportunities at UMC;
- assist departmental efforts to recruit and retain these students; *maintain a central clearing house for information and resources;
- initiate a longitudinal study of attrition by UMC black graduate students;
- identify support services to ensure success in graduate school.

Program activities include recruitment, guidance and support services. This office also sponsors informational and educational career activities. The latest materials, resources and grant information are available in the office. More information may be obtained by writing to The Graduate Student Affairs Office, 321 Jesse Hall, UMC, Columbia, Mo. 65211 or call (314) 882-6311.

GRADUATE STUDENT ASSOCIATION. All graduate students are members of the Graduate Student Association (GSA). Within the association, the Graduate Student Council consists of elected representatives from the various graduate departments and the executive board. The officers of the executive board (president, vice president, secretary and treasurer) are elected by the association each winter semester and five additional members are elected to the board by the council.

The Graduate Student Council promotes the welfare of graduate students and acts as the official voice for the Graduate Student Association. Any graduate student may gain a hearing by attending the general meetings (held approximately once a month) or through the departmental representative at these meetings.

As a divisional student government, GSA derives its funds from the Student Activities Fee. The council allocates these funds for departmental, interdepartmental and campus activities. Services currently provided by the GSA include short-term loans of hand calculators and a resume printing service. More specific information concerning the support and services available from GSA may be ob-

tained through the association's office, 109 Gentry Hall, 882-8357.

CAREER PLANNING AND PLACEMENT. The Career Planning and Placement Center, 110 Noyes, offers a number of services to help students clarify career plans. The center also assists students in identifying internships and in locating part-time employment. The various schools and colleges also provide specialized placement services for students.

STUDENT FINANCIAL AID

Graduate fellowships and scholarships are limited to students of outstanding ability who have completed, or expect to complete before the opening of the next academic year, the requirements for a bachelor's degree.

The deadline for submission of applications for the fellowships administered by the Graduate School (described below) is February 15. These applications must be accompanied by scores on the Graduate Record Examination.

UMC departments also administer many fellowships, scholarships, prizes, traineeships and other financial assistance for graduate students. For information concerning these programs, write directly to the department chair or director of graduate studies.

ASSISTANTSHIPS. Approximately 1,200 graduate teaching and research assistantships in various departments and areas are available to graduate students. Stipends for half-time nine-month appointments start at \$5,250.

A graduate assistant, normally on half-time appointment, may take a maximum of 12 hours of course work. Holders of at least quarter-time graduate teaching or research assistantships are required to pay incidental and student activity fees, however, they are exempt from out-of-state tuition.

Applications for assistantships and fellowships are made directly to the chairperson or director of graduate studies in the department or area in which the student intends to work.

Information concerning positions as residential hall resident assistants is available from the Residential Life Office, 123 Jesse Hall.

NONDEPARTMENT FELLOWSHIPS AND SCHOLARSHIPS. Any student receiving a fellowship over \$500.00, which does not include payment of the nonresident tuition, will receive a waiver of the nonresident tuition during the award period. The following fellowship programs are administered by the Graduate School:

Gregory Fellowships currently provide \$3,000 stipends for new students enrolling in UMC graduate programs. Fellowships are renewable for a second year contingent upon satisfactory progress toward degree requirements, at a level of \$2,000. A Gregory Fellow is exempt from

nonresident tuition and is allowed to hold a half-time departmental teaching or research assistantship. Application forms may be obtained from the department or area in which the student intends to work, and must be completed and returned by February 15.

G. Ellsworth Huggins Graduate Scholarships provide \$8,000 stipends for up to three years for new graduate students who intend to pursue the PhD degree. The student must be enrolled in a UMC department or area which offers the PhD degree, for the fall semester in the year in which the award is to be made. Huggins Graduate Scholars are not permitted to accept supplementary appointments dur-

ing the first two semesters of graduate study. Due to stipulations of the award, special consideration is given to students from Lamar High School, Lamar, Missouri, and Barton County, Missouri. Application forms may be obtained from the department or area in which the student intends to work, and must be completed and returned by February 15.

The D.R. Francis Fellowship competition is open to undergraduate seniors planning to attend UMC Graduate School or to graduate students already enrolled at UMC. Applicants must plan to study in the areas of public affairs or creative literature, and are required to submit, along with the application form, a brief

statement describing the plan for study. The stipend is \$2,500 for one academic year of graduate study. Application forms, available from the Graduate School must be submitted by February 15.

Curators Grant-in-Aid Awards to Foreign Graduate Students are limited in number and are open to campus-wide competition. The grant-in-aid awards are equal to the amount of nine hours of the incidental fee for one academic year. Obtain application forms and detailed information from the coordinator of International Student Programs, 114 Read Hall. To be considered for the fall semester, an application must be received by March 15.



ACADEMIC PROCEDURES

ADMISSIONS

To be accepted for work towards an advanced degree, a student must fulfill both the Graduate School minimum admission requirements and the special requirements of the department or area in which the work is to be accomplished. Admission to the Graduate School does not entitle the student to automatic candidacy for an advanced degree. A student must fulfill the graduate program requirements under the auspices of a department or area of the Graduate School. For an advanced degree to be granted, the requirements and regulations of both the Graduate School and the department or area must be satisfied.

Application forms are obtainable from the director of admissions, 130 Jesse Hall, UMC, Columbia, MO 65211. Transcripts, Graduate Record Examination (GRE), and the Test of English as a Foreign Language (TOEFL) results (if required) must be returned to admissions four weeks before graduate work is expected to begin.

THE GRADUATE RECORD EXAMINATION (GRE) and other required tests. All graduate students are required to submit the aptitude test scores of the GRE, except students requesting admission to departments that require, in place of the GRE, Miller Analogy, Terman Concept Mastery or the Graduate Management Admission Test (GMAT). A student may be admitted with permission from the graduate dean without test scores if the appropriate examination is taken during the first semester. The student may enroll in a second semester

only if the required test scores are on file in the Graduate School.

The GRE is given in October, December, January, February, April and June at many locations in the United States (including Columbia) and in many foreign countries. It is necessary to apply for the GRE six months before graduate study is to begin. For further information write to the Educational Testing Service, Princeton, NJ 08540.

CANDIDACY

General admission and degree requirements for the Graduate School are determined by the graduate faculty through its representation in 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 which, in many cases, exceed the minimum requirements of the Graduate School.

ACCEPTANCE BY DEPARTMENT OR AREA. The student must obtain departmental or area acceptance for advisement before beginning work toward the degree. Acceptance standards are determined by the department, but in general are based on prior academic record, scores on the GRE or a comparable test, and letters of recommendation.

ADMISSION TO THE GRADUATE SCHOOL. Departmental or area acceptance is required prior to Graduate School admission. Approval and, therefore ad-

mission, to graduate standing is dependent upon three criteria:

1.) Proof that the applicant has earned a baccalaureate, DVM, MD, or JD degree equivalent to that granted by the University of Missouri-Columbia.

2.) A grade point average (GPA) of B or better in the last 60 hours of undergraduate education.

3.) Official results of the Graduate Record Examination.

If any of these three requirements is not satisfied, the department or area admitting the student must submit a letter justifying the exception. The GRE may be taken during the first semester, but scores must be on file at the Graduate School before the student enrolls for the second semester of graduate work.

In addition to the general criteria and before admission, all international students from non-English speaking countries must complete the Test of English as a Foreign Language (TOEFL) given by the Educational Testing Service, Princeton, N.J., 08540.

Consult individual departments or areas for information on their special requirements and regulations. The departments are listed alphabetically in the section, **FIELDS OF STUDY**. Area programs are listed in alphabetical order in the **AREA PROGRAMS** section.

SPECIAL ENROLLMENT CATEGORIES: unclassified; post-baccalaureate; senior dual enrollment.

A person eligible for admission to the Graduate School who has not been recommended for acceptance into a de-

gree program by a department may be admitted as an unclassified student. If the student is subsequently accepted by a department into a graduate degree program, and approved by the Graduate School, the credit earned as an unclassified student may be applied toward graduate requirements, upon the recommendation of the department.

A student who has a baccalaureate degree from an accredited college or university, but who does not qualify either for admission to the graduate degree program or as an unclassified student, may be permitted to enroll in a post-baccalaureate program of continuing education. Although graduate credit will be earned by completing courses numbered 200 and above, such credit is not applicable toward a graduate degree at UMC while the student is enrolled in a post-baccalaureate program. Post-baccalaureate students who complete a minimum of nine semester hours of graduate work with a grade of B or better, and maintain a B average, may request to be changed to unclassified status or, with approval of the appropriate department, transfer into a degree program. Unless requested by the department, this work does not count toward a degree program. With the approval of the divisional and graduate dean, last semester seniors who rank in the upper half of their classes and are within 15 hours of completing graduation requirements, may dually enroll in their undergraduate division and the Graduate School. Specific circumstances exist in which exceptions to this rule are made; divisional rules should be consulted. Dual enrollment must be completed in the Graduate School within one month after the start of the fall and winter semesters and within three weeks after the start of the summer session. This program is also available to seniors in other Missouri colleges. Additional information may be obtained from the Graduate School.

GRADING AND SCHOLASTIC REQUIREMENTS

Graduate student grades in all courses counting toward an advanced degree are reported as: A (4.0), course work is of outstanding merit; B (3.0), course work is entirely satisfactory; C (2.0), acceptable only to a limited extent in fulfilling the requirements for an advanced degree. There is no D grade for graduate students, and a grade of F (0) means the work has not satisfied the minimum requirements of the course. W denotes withdrawn passing and WF denotes withdrawn failing. Graduate students enrolled in 200-level (outside their own departments) and in all 300-level courses will be informed no later than the end of the first week of classes if they will be expected to fulfill course requirements beyond those as-

signed the undergraduate students in those classes. No graduate credit is given for courses numbered 199 and below. Graduate credit is given for courses numbered 200-299 if not in the student's major department. Students receive graduate credit for courses numbered 300-399. Courses numbered 400-499 are primarily for graduate students. An incomplete grade (I) may be recorded when the student's work is incomplete but otherwise worthy of credit, or when the instructor feels unable to assign a grade at the end of the semester. The student must finish this work within the next calendar year of residence, or the (I) will remain and will not be removed. This last rule does not apply to Problems 400, Research 450 (non-thesis) or Research 490 (thesis or dissertation).

The GPA in the Graduate School is based on the student's entire graduate record in courses numbered 200 and above taken at UMC. To remain in good standing, a graduate student must maintain a cumulative GPA of 3.0 or better.

At the end of each semester, graduate students with a 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, be allowed a second and final 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 that the semester or cumulative GPA falls below 2.0.

To graduate, a student must have an overall GPA of 3.0 in graduate courses.

INTERNATIONAL STUDENTS. For information and forms concerning admission, scholarships and estimated expenses, prospective students living outside the United States are advised to write the coordinator of International Student Programs, 114 Read Hall, UMC, Columbia, MO 65211, at least a year before the date of desired admission. Application papers and official records of previous school work must be sent to admissions.

Prospective students should not make plans to leave their countries without first receiving "The Certificate of Eligibility", the I-20 Form, from the foreign student coordinator.

Students from countries where English is not the native language must take the Test of English as a Foreign Language (TOEFL), given by the Educational Testing Service, Princeton, N.J., 08540. The test is given approximately four times each year in test centers in almost every country of the world. The test should be taken from six to nine months before the opening of the session in which the student expects to enroll. A minimum score of 500 must be achieved before formal application forms are sent.

PROFESSIONAL ENGINEERING REGISTRATION

The revised statutes of Missouri (Section 327.221) require that "all applicants for registration as a professional engineer in the state of Missouri after January 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 UMC and UMC/UMKC coordinated undergraduate engineering bachelor's level programs in engineering are so accredited. Applicants who receive advanced degrees in UMC engineering are so accredited. Applicants who receive advanced degrees in UMC engineering programs but do not have a bachelor's degree in an ABET-accredited engineering program are not eligible for registration in Missouri.

If you are a candidate for a graduate degree (MS or PhD) in engineering and want to establish eligibility for registration, consult with your department chairperson about a program of study which will also 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, Missouri 65102.

TERMINATION OF GRADUATE STUDENT STATUS

In addition to dismissal for failure to meet the usual examination and grade requirements, departments and graduate degree granting areas 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 not to be making satisfactory academic progress and/or whose work is not of the quality required. The faculty advisor or department chairperson must inform the graduate dean 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. A student may initiate an appeal of this dismissal through the graduate dean. A description of the appeal procedures may be obtained from the Graduate School. The procedure for dismissal and appeal follows these guidelines:

- a) All students who are dismissed shall be notified in writing and provided with a specific statement of the reasons for the dismissal. A dismissal must be preceded by a probationary period of at least thirty (30) days.
- b) If a graduate student is dismissed by a department or area, then he/she shall have fifteen (15) days in which to make a written appeal through the

- Graduate School dean to the Graduate Faculty Senate Committee on Problems and Procedures. Said appeal shall set forth the graduate student's reasons why he/she believes he/she should not be dismissed.
- c) Students will be considered to be on probation during the period of any

- appeals.
- d) The Graduate Faculty Senate Committee on Problems and Procedures must make a decision within ninety (90) days of the date that the appeal reaches the graduate dean's office. All decisions shall be placed in writing and reviewed with the student.

- e) The graduate student or the department/area shall have fifteen (15) days to appeal this decision to the Graduate Faculty Senate.
- f) The decision of the Graduate Faculty Senate shall be final.



MASTER'S DEGREES

The University confers the master of arts, master of science, master of science for teachers, master of business administration, master of education, master of music, master of fine arts, master of public administration, master of social work, master of accountancy and master of health science degrees. For successful completion, the student must satisfy the general regulations for master's degrees, special requirements of the particular master's degree sought, and the individual departmental or area requirements.

CANDIDACY

ADMISSION TO GRADUATE SCHOOL. The student must give evidence of earning a baccalaureate, DVM, MD, or JD degree equivalent to that granted by the University of Missouri-Columbia.

ACCEPTANCE FOR ADVISEMENT. The student must obtain departmental or area acceptance for advisement before beginning work toward the degree. Acceptance is based upon prior academic record, scores on the GRE or other tests, and letters of recommendation as prescribed by regulations of the department or area.

SELECTION OF AN ADVISER AND APPLICATION FOR DEGREE. The student selects a consenting adviser from faculty members of the department or area in which the major work is planned. Prior to each semester or session registration, the student consults the adviser concerning a program of courses. After performing satisfactory work for half of a semester or for an entire summer session, the student, with the adviser's assistance, completes the form "Application 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 or area director of graduate studies to the dean of the Graduate School.

Although this form may be revised by a letter from the adviser to the graduate dean, no course once taken may ever be removed from the program. The degree

application form must be filed no later than the session preceding the semester or session in which the student expects to receive the degree.

Upon approval of the "Application for Master's Degree" by the dean of the Graduate School, the student is a candidate for the degree.

COURSE OF STUDY

The student's program must include a minimum of 30 hours beyond the bachelor's degree, or its equivalent, selected from courses carrying graduate credit. The minimum 30-hour requirement is subject to the following regulations.

RESIDENCE REQUIREMENT. To meet the residency requirement, the student must complete a minimum of 24 hours of advanced study offered by the University of Missouri-Columbia faculty.

CREDIT FOR MINOR STUDY. A student may choose a minor composed of course work selected from one or more departments, providing such course work constitutes a unified program. If selected, a minor must include at least 10 hours of course work approved by an advisor in the minor subject, and approved by the student's major advisor, the departmental or area director of graduate studies, and the graduate dean.

INDEPENDENT STUDY CREDIT OTHER THAN CORRESPONDENCE. A maximum of 12 hours of research, problems, special investigations and special readings is permitted.

CORRESPONDENCE CREDIT. Although correspondence or extension course credit earned at any other campus is not accepted by the Graduate School, the school will accept up to eight hours of correspondence courses which are authorized for graduate credit and offered by University of Missouri-Columbia faculty through the Center for Independent Study by Correspondence of the University of Missouri. To apply such courses toward a master's degree, the student must have completed at least one semester or summer session of satisfactory residence work. Exception is made for

persons in the armed services who receive, in advance, approval by the advisor and the graduate dean for correspondence work prior to establishing residence on the Columbia campus.

OFF-CAMPUS RESEARCH CREDIT. Upon recommendation of the student's advisor and approval by the departmental or area director of graduate studies and graduate dean, a student may enroll for off-campus research for a total of no more than eight hours, and no more than four hours per semester or three hours per summer session. To enroll for off-campus research, a student must have been enrolled in the Graduate School at least one summer term on a full-time basis or one semester part-time.

TRANSFER CREDIT. A maximum of six hours of graduate credit may be transferred from another university or campus of the University of Missouri upon the recommendation of the advisor and the approval of the departmental or area director of graduate studies and the dean of the Graduate School. Before taking course work off the Columbia campus, a student should first consult the advisor.

CREDIT TOWARD A SECOND MASTER'S DEGREE. A student who has completed one master's degree at the University of Missouri-Columbia or elsewhere may, upon recommendation of the adviser and approval by the departmental or area director of graduate studies and the graduate dean, present a maximum of eight hours of credit earned in the previous program toward a second master's degree. A student may pursue two master's degrees simultaneously, but not more than eight hours of credit may be applied to both programs. See dual degrees under SPECIAL REGULATIONS.

THESIS PREPARATION AND SUBMISSION

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 obtain a copy of the regula-

tions governing the preparation of theses from the Graduate School and a copy of departmental or area requirements from the departmental or area director of graduate studies. The following instructions outline the procedure for thesis acceptance.

- (1) The thesis is approved by the major advisor and a second reader from the department or area.
- (2) The original typewritten thesis is submitted to the dean of the Graduate School on or before the official deadline date preceding expected graduation. Consult the calendar in this catalog for deadline dates.
- (3) The graduate dean appoints from outside the department or area a third reader, upon whose approval the thesis is accepted. The advisor and departmental or area director of graduate studies may recommend a third reader to the dean of the Graduate School.
- (4) If the student's final examination committee recommends that the thesis abstract be included in the thesis, the student prepares an abstract of not more than 150 words for this purpose.

The dean of the Graduate School reserves the right to review all masters' theses.

GRADUATION REQUIREMENTS

During the first six weeks of the semester, in which the program of study outlined in the "Application for the Master's Degree" is expected to be completed, the candidate must personally confirm with the Graduate School all graduation arrangements.

The candidate must have completed all graduate work attempted at the University of Missouri-Columbia with a grade point average (GPA) of 3.0 (A=4.0) or better.

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. If the program includes a minor, the minor advisor will be a member of the final examination committee and will examine the candidate over course work taken in the minor.

Where a thesis is presented in partial fulfillment of graduation requirements, a final examination committee of at least three faculty members is appointed by the dean of the graduate school to administer the final examination. Members of the committee, to include the third reader of the thesis, may be recommended by the advisor and the departmental or area director of graduate studies. No fewer than three members of the committee must sign the "Report of the Master's Degree Examining Committee" form, which is then forwarded through the

departmental or area director of graduate studies to the graduate dean.

Where no thesis is presented by the candidate, the final examination committee is designated by the departmental or area director of graduate studies with the approval of the graduate dean. Certification of completion of the examinations, signed by the director of graduate studies, is forwarded to the graduate dean. All candidates for the MA or MS degrees must complete either a thesis or a substantial independent project.

The candidate must be enrolled at the UMC campus during the semester or session in which completion of the final examination is certified.

The program for the master's degree must be completed within a period of eight years after the first enrollment, not including time spent in the armed services. For any extension of this time limitation, the student must petition the graduate dean. Such petitions must be received in the Graduate School prior to the expiration of this period and must be approved by the advisor, the departmental or area director of graduate studies and the graduate dean.

For academic advice or assistance with degree program planning, students should contact the director of graduate studies of their major departments or areas, or the dean of the Graduate School.

SPECIAL REGULATIONS

In addition to the general regulations above, governing all masters' degrees, special Graduate School rules apply to each of the following masters' degrees. The latter are summarized below, along with a brief description of the nature of the degree. Again, departmental or area requirements may exceed requirements of the Graduate School.

The Master of Arts degree represents the successful completion of a unified program of course work designed to provide a high level of broad competence in a discipline. Thirty hours of graduate credit, including at least 15 hours in 400-level courses, are required. Depending upon departmental requirements, the thesis is optional.

The Master of Science degree is oriented toward research, and normally a thesis or research paper is required. The program must include 30 hours of graduate credit, with at least 15 hours of these being in 400-level courses.

MASTER OF ART AND MASTER OF SCIENCE DEGREE REQUIREMENT. All candidates for the master of art and master of science degrees are required to complete a substantial independent effort reflecting some measure of creativity and/or originality and to produce evidence of such effort. This evidence may be in the form of a thesis; an original composition or design; a publishable manuscript; an artistic performance; a

creative writing, a translation or an essay of publishable quality; or other expression of independent effort determined to be appropriate by the department in which the student seeks advisement. Academic credit allowed for this portion of a student's program shall not be less than three nor more than twelve credit hours.

There must be a statement of the project or thesis on file in the Graduate School. This statement must be signed by the advisory committee and approved by the dean of the Graduate School. The graduate dean reserves the right to review the final product or thesis. No MA or MS will be granted without fulfillment of this requirement.

The Master of Science (Physical Sciences) program 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. No thesis is required. Of the required 40 hours of graduate credit, 32 hours are distributed among the Departments of Physics, Chemistry and Mathematics, and eight hours are elected from other disciplines approved by the candidate's advisor. A student must complete at least eight hours in 400-level courses, which should not include more than three hours in seminar courses. This advanced work must be in the fields mentioned above. Math 80 and Math 175 or their equivalents should be presented for admission to candidacy or be taken without credit toward the degree. If not taken before admission, Math 201 or its equivalent must be included in the program for the degree.

The Master of Arts in Physical Education degree represents advanced study in physical education with a special focus in the area of human performance. The program requires 30 semester hours of graduate work including a thesis and prepares graduates for careers in fitness, wellness and rehabilitation.

The Master of Science for Teachers is designed to strengthen the subject matter competence of high school teachers in those sciences commonly taught in the nation's high schools. It is not intended to qualify the recipient for a junior college or college teaching position, nor to count as a full year's work toward the doctoral degree. At least 24 semester hours of acceptable credit in college-level sciences and a teaching certificate are required for admission to the program. This degree is offered in the areas of mathematics, economics and physical science (physics). It requires 30 hours of graduate work, including one 400-level course in the area. Only subject matter courses can be used to satisfy the requirement, although the program is quite flexible in order to meet the needs of individual students.

The Master of Education degree, as distinguished from the master of arts in education degree, does not emphasize research. Designed to prepare profession-

al educators at a broad level of competence, it requires a minimum of 32 hours of graduate courses including 16 hours of 400-level courses.

The Master of Business Administration degree provides advanced professional training in finance, management and marketing for persons preparing for careers in business. Graduate work totaling 54 hours, with at least 24 hours of 400-level courses is normally required. Part of this may be waived for students having the proper undergraduate background (for example, majors in Business).

The Master of Public Administration degree offers academic preparation for administrative careers in local, state, and national governments and other public agencies. The degree consists of 48 hours of graduate courses and a summer internship.

The Master of Health Sciences is presently granted only for work in audiology and speech-language pathology. It is a 36-hour master's degree with 27 hours of 400-level work required. The degree can be clinically oriented or a research degree with a thesis. The MHS qualifies a student to seek admission to the doctoral program in speech and dramatic arts.

The Master of Music degree, which represents an advanced level in achievement in applied music, requires 32 hours of graduate work, including at least 16 hours in 400-level courses. All candidates must give a recital.

The Master of Social Work degree provides a beginning leadership competence in professional social work practice. The MSW degree requires 60 hours of graduate work, except for holders of the BSW from UMC who, if accepted for admis-

sion to the graduate program, may complete the MSW requirements in one year.

The Master of Fine Arts degree provides superior preparation in the pictorial arts or design and crafts for those whose aim is professional work in the field of art or for those who plan to teach at the college level. Of the 60 credit hours required for the degree, 54 credit hours are in studio art courses with a minimum of 30 hours in a major studio area (design, painting or sculpture) and 9 hours in a minor studio area. The remaining 15 hours of the 54 studio hours may be in studio courses outside the major and minor area. A minimum of 30 credit hours must be in courses numbered 400 and above. A minimum residence of two years and a two-part thesis are required.

The Master of Accountancy degree is a one-year program of advanced professional study covering the environment of accountancy, advanced accountancy and accountancy practice fields. It is the fifth year of the professional accountancy program and provides a better foundation for entering the public accounting world.

Dual Degrees. There are several schools and departments that have formal agreements to award dual masters' degrees simultaneously. These formal agreements are on file in the Graduate School. Each master's degree must meet the requirement of 30 hours beyond the bachelor's degree of courses 200 and above. The requirements for a dual master's degree are detailed under the participating programs.

Dual Degree Programs for Medical Students. Using the flexibility of the medical curriculum, medical students may pursue a master's or PhD degree while enrolled in medical school. After

acceptance into medical school, a student must be accepted in the graduate degree program selected. Students interested in either (master's or PhD) dual degree program should inquire at the dean's office of the School of Medicine. Applications for medical school from students in the basic sciences will not be accepted without a letter from the chairperson of the basic science department, or if evidence is shown that the degree program would be complete prior to medical school enrollment.

The master's-MD program enables medical students to complete a master's degree within a four-year span of enrollment in medical school. The program allows qualified students to seek in-depth involvement in disciplines of their choice, based upon their future role and earlier background and interests. Master's programs may be pursued in the basic sciences, public health and in other disciplines, including humanities, engineering, agriculture, journalism and the arts. Financial support may be provided for the graduate portion of the dual degree program.

The MD-PhD is a six-year program for the student seeking a biomedical research career. Two additional years are to be worked into the medical curriculum to satisfy requirements for the PhD. This is usually accomplished by a post-sophomore year and a post-MD year. PhD programs are available in anatomy, biochemistry, microbiology, nutrition, pharmacology, physiology, psychology and pathology. Fellowship support may be provided for the PhD portion of this program, while loan and scholarship funds may be available for the MD curriculum.



THE EDUCATIONAL SPECIALIST DEGREE

This degree, offered through the College of Education, is a 30 semester hour program beyond the master's degree, of which 24 semester hours must be taken with UMC faculty. A student is required to take a final examination and the re-

port of the results must be signed by a majority of the candidate's advisory committee members and submitted to the graduate dean. A maximum of six hours may be accepted in transfer from institutions accredited to offer post-master's

degrees. Off-campus courses authorized for graduate credit and offered by UMC faculty members through the Center for Independent Study by Correspondence of the University of Missouri may be included in the program.



DOCTORAL DEGREES

The University of Missouri-Columbia Graduate School grants two types of doctoral degrees - the doctor of philosophy and the doctor of education. To obtain a doctoral degree, a student must successfully fulfill the general regulations required for the particular degree as well as the special requirements of the individual department or area. It is the student's responsibility to make sure all regulations and requirements are satisfied. No individual who, at any time, has held the rank of assistant professor or above on this campus is eligible for a doctoral degree from UMC.

CANDIDACY

In order to become a candidate for a doctoral degree, a student must be accepted for advisement in a department or area. Acceptance is based on prior academic record, scores on the GRE or other tests, and letters of recommendation as prescribed by the department or area of interest. The student must then be officially admitted to the Graduate School.

SELECTION OF AN ADVISER. The student selects an adviser, by mutual consent, from doctoral faculty members who are dissertation supervisors in the department or area in which the major work is planned.

APPLICATION FOR DEGREE. By the end of the first year of doctoral work at UMC, a student should file a formal application for the degree of doctor of philosophy or Education and a "Request for the Advisory Committee" form. These forms are available in the Graduate School. The student's advisor and the departmental director of graduate studies sign the forms which are then submitted to the graduate dean.

QUALIFYING EXAMINATION. To be officially admitted to the PhD study program, the student must pass a qualifying examination. Any department or area may limit the number of times this examination may be attempted.

COMPREHENSIVE OR MATRICULATION EXAMINATION. To be an official candidate, the student must pass the comprehensive examination for the PhD or the matriculation examination for the Ed.D.

RESIDENCY REQUIREMENT

Within the overall temporal doctoral requirements is the basic need to establish an *in-residence* presence on the University of Missouri-Columbia campus. A student must spend a specific amount of time on campus to be exposed to the

traditional ambience created by graduate school experiences.

One calculates the *overall three year doctoral time requirement* by applying the following guidelines (given in narrative and table form below): a 12- to 16-hour semester is considered a full 12-hour semester (if this load is carried for two semesters the individual will be credited with one year); a nine- to 11-hour semester is considered to be three-fourths of a 12-hour semester (if this load is carried for two semesters the individual will be credited with three-fourths of a year); a six- to eight-hour semester is considered as one-half of a 12-hour load (carried for two semesters, one-half of a year); a three- to five-hour semester is counted as one-fourth of a 12-hour semester (one-fourth of a year if carried both terms); a semester or summer session of less than three hours does not count toward doctoral requirements. The maximum number of hours that can be applied during summer is eight. In calculating the temporal requirement for the doctoral (PhD and EdD) degree, one must sum the years (or fraction thereof) to add up to three full years (as follows):

Semester Credit Hours	Year Fractions
12 to 16 hours (semester maximum)	.50 year
9 to 11 hours	.375 year
6 to 8 hours (summer maximum)	.25 year
3 to 5 hours	.125 year
0 to 2 hours	.0 year

In order to qualify for the *in-residence requirement at UMC*, a student must complete at least two 12-hour semesters or three 8-hour semesters in an 18-month period (or less) on the Columbia campus in order to obtain a doctoral degree. 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. The requirement may be met, in part, with research credit carrying the grade of incomplete. While three full years (for the PhD, at least 72 hours and for the EdD, 82 hours) of academic work beyond the bachelor's degree are required for the doctoral degree, two years (in addition to the *in-residence* requirement) may be credited by obtaining the master's degree (one year) and one year of additional work done either on the Columbia campus or from work performed on another campus, as approved by the student's advisory committee and the graduate dean. Correspondence and extension courses are not counted toward these doctoral requirements except as part of the master's and educational specialist degrees.

A reasonable rate of progress toward the degree is required. Excluding work toward the master's degree or its equivalent, the program for the doctoral degree should be completed within eight calendar years. Before the expiration of the eight-year period, any student requiring additional time must submit a request to the advisor. If the advisor approves the request, a formal request is then made to the graduate dean. An extension, if granted, may entail a revision of the candidate's program to update course work and research.

CONTINUOUS REGISTRATION, requiring enrollment in each fall, winter, and summer term, is mandatory for all doctoral students who have passed their comprehensive or matriculation requirements. Failure to comply with this regulation results in the cancellation of candidacy.

A student who has completed all requirements for the degree, except the dissertation, must enroll for credit commensurate with academic activities, but in no case less than two credit hours of 490/491 research in any semester. Registration in one hour of 490/491 research is required for summer sessions. Students must continue to enroll each registration period until the degree is awarded.

OFF-CAMPUS RESEARCH. To enroll for off-campus research, a student must have completed 32 semester hours of acceptable graduate work. Credit for off-campus research work for doctor of education candidates is limited to three semester hours during a given semester and a total of six semester hours.

STRUCTURE OF DOCTORAL COMMITTEES

Membership in the various committees varies according to the circumstances and may or may not remain the same. In any case, the membership of each committee is approved by the graduate dean.

Advisory Committee: A five-member (minimum) advisory committee is officially recommended by the student's advisor for the graduate dean's approval. This committee must include at least one individual from outside the major department with three or four of the remaining members from within the department. This committee usually administers the qualifying and comprehensive examinations.

Comprehensive/Matriculation Examination Committee: A separate designation must be made to the graduate dean indicating the constituency of this com-

mittee. It may be the same as the advisory committee or of different membership. If a new committee is formed for this task, the same selection process is utilized as that undertaken for the formation of the Advisory Committee (minimum of five, with one or more from outside the department).

Dissertation and Final Examination Committees (the following two options apply only to the PhD program - see the section on the EdD for its specific requirements):

Plan 1. The candidate must submit the dissertation to the advisor and a second reader (chosen by the advisor) in the department. Upon approval, the dissertation is submitted to the graduate dean on or before the official deadline date preceding the expected graduation.

The dean appoints a third reader who must be outside the department. A dissertation will not be sent to a third reader when UMC is not officially in session.

Upon approval of the dissertation, the dean appoints, at the request of the advisor, a final dissertation examination committee. This committee will include the advisor, the second and third readers, and two or more others as specified by the dean.

The final examination may be written and/or oral; if oral, it may be open to the general faculty. The candidate must be enrolled to take this examination, which is not administered when UMC is not officially in session.

The advisor reports the results to the Graduate School before the designated deadline.

Plan 2. In this option, the advisory, comprehensive examination, and dissertation committees may be the same, but their activity and designation must be submitted to the dean of the Graduate School at the appropriate time. Their constituency is given under the description of the advisory committee as above.

At the appropriate time, a dissertation committee is designated by the dean upon submission of a request by the dissertation supervisor. A detailed proposal of the dissertation topic must accompany this request. The dissertation committee may be appointed anytime after the student has passed the qualifying examination.

The dissertation committee reviews the dissertation proposal and reports its recommendations to the dean. The approval of the dissertation proposal must be filed with the dean at least six months prior to graduation. The final approval of the dissertation requires a separate report from each committee member.

The dean authorizes the holding of the final oral examination, and the date, time, and place of the examination is announced and published. The candidate must be enrolled to take this examination which is not administered when UMC is not officially in session.

DISSERTATION

Since a dissertation is required, every doctoral candidate should obtain from the Graduate School regulations governing the preparation of dissertations and consult the director of graduate studies for departmental style requirements.

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

On or before the official deadline date preceding expected graduation, the candidate must submit the dissertation to the dean of the Graduate School along with a request for a third reader (see "Structure of Doctoral Committees" above). To meet graduation requirements, the dissertation must be submitted in a form suitable for binding and microfilming. Manuscript rules may be obtained from the Graduate School. The manuscript must be accompanied by a brief title of no more than 50 letters and spaces, an abstract of not more than 350 words, and a brief biographical sketch in paragraph form.

The publication of a dissertation must include suitable acknowledgement indicating that it is a dissertation or portion of a dissertation submitted to the graduate faculty of the University of Missouri-Columbia in partial fulfillment of the requirements for the degree of doctor of philosophy or doctor of education.

PHD DEGREE REGULATIONS

The student's advisor officially recommends, for the approval of the graduate dean, a five-member advisory committee (see "Structure of Doctoral Committees" above). This committee administers the qualifying examination, which aids in assessing the student's background and prospects for success in working toward a PhD degree.

The program of study must constitute a definite plan of training for research or scholarly investigation in a particular field and requires a minimum of 15 hours of 400-level coursework (excluding research problems and independent study experiences) beyond the baccalaureate degree. In addition to specifying appropriate course work for its PhD students, the advisory committee recommends special requirements (foreign language or special skills) within overall departmental guidelines. Certain departments have special language requirements or substitutions. In general, foreign language proficiency, if required, may be satisfied by one of the two following options:

- (1) ability to translate into English two foreign languages or
- (2) a high order of ability to read, write and converse in one foreign language,

and to translate that language into English and English into that language.

The chairman of the advisory committee, after conferring with the student and the advisory committee, submits to the Graduate School a report which includes (1) a copy of the proposed course of study (2) recommendations for the language preparation, collateral field and other special requirements, and (3) any request for transfer of graduate credit. The student must complete the course work as outlined in the formal program of study to the satisfaction of the advisory committee and the graduate dean before being considered for the comprehensive examination.

COMPREHENSIVE EXAMINATION. The major advisor applies to the graduate dean for an examining committee to administer the comprehensive examination when the doctoral student has (1) passed the qualifying examination, (2) met the language or special requirements, (3) essentially completed all the planned course work, and (4) completed two years of the time requirement (see section entitled "Residency Requirement"). The comprehensive examination is the most advanced posed by UMC. It contains both written and oral sections. It must be completed at least seven months before the final defense of the dissertation and oral examination (see GRADUATE SCHOOL CALENDAR). The two sections of the examination must be completed in one month.

The written segment of the comprehensive examination is arranged and supervised by the major advisor. It consists of written questions prepared and graded by members of the comprehensive committee. Upon satisfactory completion of the written examination, the student is orally examined by the committee. For the comprehensive examination to be successfully completed, all but one of the committee must vote to pass the student. A report of this examination, carrying the signatures of all members of the committee, is sent to the graduate dean. If failure is reported, the committee recommends suggested work or other remedial measures.

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

SPECIAL EdD DEGREE REGULATIONS

A minimum of 82 semester hours of course work beyond the bachelor's degree is required for the degree of doctor of education. The program of studies is specifically intended to meet the professional needs of the candidate.

To be accepted for advisement, the student must have attained the degree of master of arts with a major in education or a master of education, or the quantitative and qualitative equivalent of one of

these degrees, from an accredited college or university.

QUALIFYING EXAMINATION AND PROGRAM OF STUDY. The student's advisor officially recommends for the approval of the graduate dean an advisory committee of at least five 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 prospects for the EdD degree. It also guides the planning of the study program.

If required, the qualifying examination must be successfully completed before the study program is determined by the advisor and the student in cooperation with the 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.

MATRICULATION EXAMINATION. As well as pursuing course work in the professional areas of specialization, the student must take courses in educational statistics, advanced educational statistics and methods of educational research. Foreign languages are not required except as may be determined by the student's advisory committee.

When the student's advisory committee determines that the needed course work has been completed with satisfactory grades, it plans the matriculation examination (a written and oral comprehensive examination which 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 the final oral examination (see GRADUATE SCHOOL CALENDAR).

For the matriculation examination to be successfully completed, all but one of the advisory committee must vote to pass the student. If failure is reported, the committee recommends suggested work or the remedial measures.

The student who fails may not take a second examination for at least 12 weeks. Failure on two matriculation examinations will automatically prevent candidacy at UMC.

DISSERTATION FOR THE DOCTOR OF EDUCATION. The dissertation, for which not less than 12 hours of credit may be granted, has no maximum credit restriction, providing that more than 70 graduate hours of other approved courses are completed and granted toward the doctor of education degree. The dissertation must be reviewed and approved by the candidate's advisory committee.

In addition, the advisory committee, including the advisor, conducts a final oral examination on the work included in the dissertation. The candidate must be enrolled for this examination, which is not to be taken when UMC is not officially in session.

MASUA AND INTER-UM TRAVELING SCHOLARS

The Mid-America State University Association (MASUA), of which UMC is a member, sponsors a traveling scholar program in which advanced doctoral candidates may spend a term of study at another MASUA university.

Under the program, students may cross state and institutional lines for work in highly specialized areas at neighboring campuses while paying fees, registering and receiving credit at their home universities. Generally, the program is available for one semester.

In this program, UMC cooperates with the Universities of Kansas, Oklahoma and Nebraska; Kansas State, Oklahoma State and Iowa State Universities.

To participate in the program, a student must make certain that the resources are not available on the home campus and requests permission from the graduate advisor to spend a semester on a campus offering the resource. Arrangements are made by the student's advisor with a counterpart professor at the host university, followed by application for approval to the appropriate administrative office on each campus.

Limited financial support is available. Interested students should contact the Graduate School for details. A similar program is available for students on other University of Missouri campuses.

UM-TRAVELING SCHOLAR PROGRAM

This cooperative program is designed to provide breadth and depth in the opportunities for graduate study offered at the four campuses of the University of Missouri by permitting advanced graduate students at any one of the UM campuses to enroll in courses that are not available on their home campus. Enrollment at the host campus is normally limited to no more than one or two courses per semester. Only students in good standing who have been admitted to a graduate degree program on the home campus may participate. Courses completed at the host campus must be applicable toward requirements for the degree sought by the student at the home campus either by way of transfer credit or as resident courses. The student's advisor initiates the proposal for the student's enrollment in a given course by contacting the professor at the UM campus where the student wishes to study. The concurrence of the respective graduate deans is required. When participating in the program, the student will register for the appropriate number of hours and pay fees at the home campus.

Contact the Graduate School for more information regarding these programs.



FIELDS OF STUDY

ACCOUNTANCY College of Business and Public Administration

FACULTY

- Rick Elam**, professor, director, PhD, University of Missouri-Columbia
James C. Stallman, professor, director of graduate studies, PhD, University of Illinois
Robert L. Kvam, professor, coordinator of MA program, PhD, Louisiana State University
Eugene L. Zieha, professor, coordinator of MS program, PhD, University of Illinois
Wilber C. Haseman, professor, PhD, Syracuse University
Loren A. Nikolai, professor, PhD, University of Minnesota
James E. Parker, professor, PhD, Michigan State University
Joseph A. Silvosio, professor, PhD, University of Missouri-Columbia
Raymond C. Dockweiler, associate professor, PhD, University of Illinois
James C. Lampe, associate professor, PhD, University of Michigan
Charles Litecky, associate professor, PhD, University of Minnesota
Ralph E. Skelly, associate professor, PhD, University of Alabama
Thomas P. Howard, assistant professor, PhD, Arizona State University
Earl R. Wilson, assistant professor, PhD, University of Missouri-Columbia
Jere R. Francis, assistant professor, PhD, University of New England (Australia)
Jenice P. Stewart, assistant professor, MA, University of Illinois, Champaign-Urbana

GRADUATE DEGREES OFFERED

Master of accountancy

MS in accountancy

PhD in accountancy

The School of Accountancy offers graduate work leading to the master of accountancy, master of science 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 somewhat ahead of current practice, the school offers course work stressing advanced knowledge in accounting theory, data processing, quantitative methods, economics and business. Opportunities exist, both on and off the campus, for interchanging ideas with practicing accountants and for participating in the solution of their professional problems.

Among the special facilities are a comprehensive collection of accounting and investment services, technical journals and microfilm copies of annual reports, government documents and doctoral dissertations.

Fellowships, scholarships and teaching and research assistantships are avail-

able to qualified graduate students. Submit applications by March 1.

For additional information, including an individually prepared tentative program of study and application forms, write the director of graduate studies.

MASTER'S DEGREES

The school offers two master's degree programs. The master of accountancy (MAcc) degree is designed for students who have an undergraduate degree in accountancy. The master of science (MS) degree is limited to those with a baccalaureate degree in a field other than accountancy.

A candidate for admission to either program must meet the following criteria:

(1) Have a 3.0 or higher overall GPA in undergraduate work (A = 4.0). Consideration is given to grade trends, performance in the student's major area, class rank, maturity, experience and other factors bearing on a student's probable success in advanced professional study.

(2) Show acceptable performance on the Graduate Management Admission Test (GMAT) or the Graduate Record Examination (GRE).

MASTER OF ACCOUNTANCY

The master of accountancy degree is a one-year program of advanced professional study covering the environment of accountancy, advanced accountancy and accountancy practice fields. It is the fifth year of the professional accountancy program. A limited amount of specialization is permitted to meet individual career objectives of students.

For the MAcc degree, a candidate must (1) complete substantially all course requirements for the accountancy undergraduate degree at UMC or their equivalent. Courses taken as a graduate student to fulfill undergraduate prerequisites do not carry graduate credit, except that a maximum of 6 semester hours of such courses may be counted; (2) complete 30 semester hours of graduate course work approved by the program coordinator, including at least 20 hours in courses reserved exclusively for graduate students, 15 hours of which must be in accountancy. At least 6 hours must be from outside the School of Accountancy; (3) maintain a grade average of B (3.0) or better; and (4) comply with time limitations and other matters specified in this catalog.

MS IN ACCOUNTANCY

A four-semester professional program for the MS degree is built around a core of accelerated courses inaugurated specifically for the mature student. In addition to accountancy courses, the curriculum

consists of balanced coverage of the following major areas: economics, electronic data processing, law, business and public administration (organization, functions, problems), mathematics and statistics.

The first year of study consists of foundation courses to provide basic concepts, techniques and analytical thought processes for advanced study of accounting. A foundation course may be waived for students whose undergraduate records indicate that they have already successfully mastered the equivalent subject matter.

Second-year courses cover the advanced educational requirements of the professional accountant or accounting-oriented business manager. They stress the theory and practice of accounting and give balanced consideration to the various accounting areas in relationship to the organization, functions and problems of business and public administration.

To complete requirements for the MS degree, a student must (1) complete the professional program of study with an average grade of B (3.0) or better and (2) comply with time limitations and other matters specified in this catalog.

DOCTORAL DEGREE

In order to be considered for acceptance into the School of Accountancy doctoral program, a candidate must meet the following criteria:

(1) Have a 3.0 or higher overall GPA in undergraduate work (A = 4.0). Consideration is given to class rank, grade trends, experience, maturity and other factors bearing upon probable success in the program.

(2) Have a 3.0 or higher grade point average in at least 30 hours of graduate work.

(3) Show superior performance on the Graduate Record Exam (GRE) or the Graduate Management Admission Test (GMAT).

To be admitted, a student must complete the equivalent of the master of accountancy and demonstrate competency in the following areas: financial accounting and auditing, cost and managerial accounting, data processing, taxation and governmental accounting. Course work equivalent to the master's degree may be transferred from another institution. Competency is demonstrated by a written and/or oral qualifying examination conducted by an advisory committee. The qualifying examination is given once each year, early in the fall semester, and is used together with other credentials by the student's advisory committee to

determine the course of study to be fulfilled.

The PhD program in accountancy requires at least two years beyond the master's degree and consists of (1) a course of study, (2) practical experience in teaching and research, (3) an examination over accumulated knowledge in a major and two supporting fields and (4) demonstration of research and writing ability by completing a doctoral dissertation on an approved research topic.

Acceptable work (up to 36 hours) completed in a master's program (or its equivalent) is included in a student's course of study, which is composed of the following categories (all hours are minimums): accountancy, the primary field, 24 hours; research techniques, 12 hours; first supporting field, 12 hours; second supporting field, 12 hours; elective area, 6 hours.

Supporting fields are selected from behavioral science, data processing, economics, finance, management, marketing, organization theory, public administration, quantitative methods or other definable areas related to accounting and acceptable to the advisory committee. One supporting field must be from outside the College of Business and Public Administration.

AGRICULTURAL ECONOMICS

College of Agriculture

FACULTY

J. Bruce Bullock, professor, chairperson, PhD, University of California-Berkeley
Gary T. Devino, professor, director of graduate studies, PhD, Pennsylvania State University
Myron D. Bennett, professor, MS, University of Missouri-Columbia
Robert J. Bevins, professor, PhD, Michigan State University
Melvin G. Blase, professor, PhD, Iowa State University
Curtis H. Braschler, professor, PhD, Purdue University
Charles L. Cramer, professor, PhD, University of Missouri-Columbia
Robert M. Finley, professor, PhD, University of Illinois
Glenn A. Grimes, professor, MS, University of Missouri-Columbia
Joseph C. Headley, professor, PhD, Purdue University
Victor E. Jacobs, professor, PhD, Kansas State University
Elmer R. Kiehl, professor, PhD, Harvard University
J. Wendell McKinsey, professor, assistant dean, AM, University of Missouri-Columbia
Donald D. Osburn, professor, PhD, North Carolina State University
C. Brice Ratchford, professor, PhD, Duke University
V. James Rhodes, professor, PhD, Harvard University
Kenneth C. Schneeberger, professor, PhD, Oklahoma State University
Philip F. Warnken, professor, PhD, Michigan State University
Jerry G. West, professor, PhD, Michigan State University
Herman E. Workman, professor, PhD, Oklahoma State University
Maury E. Bredahl, associate professor, PhD, University of Minnesota
Norlin Hein, associate professor, PhD, University of Minnesota
James B. Kliebenstein, associate professor, PhD, University of Illinois
John A. Kuehn, associate professor, PhD, University of Missouri-Columbia
Stephen F. Matthews, associate professor, PhD, JD, University of Missouri-Columbia

Francis P. McCamley, associate professor, PhD, Iowa State University
Richard K. Rudel, associate professor, PhD, Colorado State University
Abner W. Womack, associate professor, PhD, University of Minnesota
Kevin Moore, assistant professor, PhD, Iowa State University
Ronald L. Plain, assistant professor, PhD, Oklahoma State University

GRADUATE DEGREES OFFERED MS in agricultural economics PhD in agricultural economics

The Department of Agricultural Economics offers graduate work leading to the master of science and doctor of philosophy degrees. The PhD program emphasizes preparation for research, teaching and extension. The MS program may be a step toward the PhD, but is frequently used as a terminal program for those interested in agribusiness, extension or government. Programs are flexible, while all PhD and most MS students become involved in the research program, those whose career interests lie in other directions find the department willing to accommodate them.

A 3.25 GPA (A=4.0) is generally a minimum requirement for financial assistance in the form of fellowships and assistantships for research and teaching. Support for research is available from the Agricultural Experiment Station and other granting agencies. After one semester, the records of graduate students without assistantships are evaluated and financial assistance is considered for those students who show superior performance and promise. Write the director of graduate studies for further information on financial assistance.

MASTER'S DEGREE

Students with GPA's much below 3.00 in their last two years are discouraged from applying. Before admission to the MS program, a student should have completed at least nine hours of agricultural economics and/or economics, a course in calculus, and a statistics course.

For the MS degree, a minimum of 30 hours selected from graduate level courses must be completed. The program must include at least two graduate-level courses in micro- and macro-economics theory and one graduate-level statistics course in multiple regression. Credit for research (usually 6 to 8 hours) is included in the minimum 30 hours.

Another option open for MS students is an agribusiness management program. The agribusiness management program requires no thesis, but does include an internship requirement for persons without industry experience. Course requirements for this program include six hours of economics, six hours of mathematics and statistics, nine hours of agricultural economics and twelve hours of business administration courses.

DOCTORAL DEGREE

Departmental acceptance of the student as a PhD candidate is based upon

satisfactory performance on a doctoral qualifying examination.

The size, quality and diversity of the faculty permits a broad choice of advisors and research topics. Students may specialize in farm management/production economics, econometrics and price analysis, marketing and agribusiness, natural resources, or international economic development.

The student and the advisory committee have considerable latitude in planning a program of study. There is no requirement for language or for total hours, although the program usually includes about 15-18 courses (excluding research) beyond the bachelor's degree. The course of study, which emphasizes particular interest areas, should prepare the student for comprehensive exams.

The general course requirements of the department consist of a well-balanced selection of courses, including at least five agricultural economics courses at the 400-level; economic theory-courses in micro- and macro-theory at the intermediate and advanced levels; quantitative methods; and courses in statistics, introductory mathematical economics and econometrics; outside field which requires a minimum of nine hours graduate level course work in an outside area or beyond the requirements listed above. Each student must pass examinations in agricultural economics, economic theory and a specialty area.

A dissertation embodying the results of original research must be written on a subject approved by the candidate's advisory committee. A final oral examination over the dissertation completes the degree requirements.

AGRICULTURAL ENGINEERING

College of Agriculture College of Engineering

FACULTY

Neil F. Meador, chairperson, professor, director of graduate studies, PhD, Michigan State University
Maynard E. Anderson, professor, PhD, University of Missouri-Columbia
Donald B. Brooker, professor emeritus, MS, University of Missouri-Columbia
C. LeRoy Day, professor, PhD, Iowa State University
James C. Frisby, professor, PhD, Iowa State University
Maurice R. Gebhardt, professor, PhD, University of Missouri-Columbia
F.D. Harris, professor, PhD, University of Arkansas
Allen T. Hjelmfelt Jr., professor, PhD, Northwestern University
Kenneth L. McFate, professor, MS, University of Missouri-Columbia
Milton D. Shanklin, professor, PhD, University of Missouri-Columbia
H. David Currence, associate professor, PhD, Iowa State University
Wilson Goddard, associate professor, PhD, University of California-Davis
Eugene L. Iannotti, associate professor, PhD, University of Maryland
Richard E. Linhardt, associate professor, PhD, University of Missouri-Columbia
Dennis M. Sievers, associate professor, PhD, University of Missouri-Columbia
James M. Gregory, assistant professor, PhD, Iowa State University

William G. Hires, assistant professor, PhD, University of Missouri-Columbia

Eve Lissik, assistant professor, PhD, Cornell University

Thomas R. McCarty, assistant professor, PhD, Cornell University

GRADUATE DEGREES OFFERED

MS in agricultural mechanization

MS in agricultural engineering

PhD in agricultural engineering

The Department of Agricultural Engineering offers graduate study leading to the master of science and doctor of philosophy degrees.

Research programs in the department include the following areas: bioengineering, crop processing, power and machinery, soil and water control, structures and environment, waste disposal and alternate energy sources.

Special facilities for research include the Samuel Brody Animal Climatology Laboratory, an agricultural pollution and water quality research laboratory, a new technology home with a solar collector, a farm-size methane gas generator, and farm-sized research alcohol still.

Information resources include a departmental library, the UMC Ellis Library, a microfiche collection of papers presented at major technical society meetings since 1968, and the Campus Computing Center.

Research assistantships are available to qualified graduate students. Write the director of graduate studies for information.

MASTER'S DEGREES

Applicants for the master of science degree in agricultural engineering must hold an undergraduate degree in agricultural engineering or its equivalent. Those entering the master of science degree program in agricultural mechanization must have at least 22 hours of undergraduate credit in agricultural mechanization courses.

All applicants for master's degrees are considered on the basis of undergraduate GPA's, grade trends, class rank and faculty recommendations. All students are required to take the GRE.

A student must complete a minimum of 30 hours of graduate work, with at least 15 in 400-level courses. Up to 12 hours may be in research or special problems. A thesis is required of students supported on research assistantships and is optional for others.

DOCTORAL DEGREE

The doctoral program normally requires three years beyond the bachelor's degree; a minimum of 15 hours of 400-level work, excluding problems or research, beyond the BS degree; and the student must demonstrate the ability to carry out independent research by presenting a dissertation embodying the results of original investigation.

Departmental acceptance of the candidate is based upon satisfactory performance on a master's examination or doctoral qualifying examination--written and/or oral. Candidacy of a student who

has earned a master's degree elsewhere shall be determined by an examination administered by the department. Other requirements for admission are basically the same as those for the MS degrees in agricultural engineering. A foreign language is not required.

AGRONOMY

College of Agriculture

FACULTY

Bob G. Volk, professor, chairperson, PhD, Michigan State University

George H. Wagner, professor, director of graduate studies, PhD, University of Missouri-Columbia

Richard J. Aldrich, professor, PhD, Ohio State University

Laurel Anderson, professor, PhD, University of Minnesota

Robert W. Blanchar, professor, PhD, University of Minnesota

James R. Brown, professor, PhD, Iowa State University

Lloyd E. Cavanah, professor, MS, University of Missouri-Columbia

Edward H. Coe Jr., professor, PhD, University of Illinois

O. Hale Fletchall, professor, PhD, University of Missouri-Columbia

Homer C. Folks, professor, PhD, Iowa State University

Gordon Kimber, professor, PhD, University of Manchester

Gary F. Krause, professor, PhD, Virginia Polytechnic

C. Jerry Nelson, professor, PhD, University of Wisconsin

Myron G. Neuffer, professor, PhD, University of Missouri-Columbia

Elroy J. Peters, professor, PhD, University of Wisconsin

John M. Poehlman, professor, PhD, University of Missouri-Columbia

Gyorgy P. Redei, professor, CSc, University of Budapest

William P. Sappenfield, professor, PhD, University of Missouri-Columbia

Clarence L. Scrivner, professor, PhD, University of Missouri-Columbia

Dale T. Sechler, professor, PhD, University of Missouri-Columbia

Howell N. Wheaton, professor, PhD, University of Kentucky

Marcus S. Zuber, professor, PhD, Iowa State University

Satish A. Anand, associate professor, PhD, University of Wisconsin

Dale G. Blevins, associate professor, PhD, University of Kentucky

Gregory G. Doyle, associate professor, PhD, University of Illinois

Roger G. Hanson, associate professor, PhD, University of Minnesota

J. Perry Gustafson, associate professor, PhD, University of California

Harold D. Kerr, associate professor, PhD, Washington State University

Russell L. Larson, associate professor, PhD, University of Illinois

Harry C. Minor, associate professor, PhD, University of Illinois

Joe H. Scott, associate professor, BS, Mississippi State University

David A. Sleper, associate professor, PhD, University of Wisconsin

Stephen Anderson, assistant professor, PhD, North Carolina State University

Jack B. Beckett, assistant professor, PhD, University of Wisconsin

Paul R. Beuselinck, assistant professor, PhD, Oregon State University

Daryl D. Buchholz, assistant professor, PhD, Kansas State University

Larry L. Darrah, assistant professor, PhD, Iowa State University

James Forwood, assistant professor, PhD, Kansas State University

Clark Gantzer, assistant professor, PhD, University of Minnesota

Diana Helsel, assistant professor, PhD, Iowa State University

Zane Helsel, assistant professor, PhD, Iowa State University

Randall Miles, assistant professor, PhD, Texas A&M University

James Schaffer, assistant professor, PhD, Kansas State University

Neil Cowan, visiting assistant professor, PhD, Iowa State University

GRADUATE DEGREES OFFERED

MS in agronomy

PhD in agronomy

The Department of Agronomy offers graduate study leading to the degrees of master of science and doctor of philosophy. The MS degree in agronomy may emphasize crop science and genetics, or soil science. The PhD is offered in six general program areas: crop breeding and genetics, crop physiology and management, soil chemistry and biochemistry, soil pedology and mineralogy, soil-plant relationships, and weed science.

The department maintains field, greenhouse and laboratory facilities for research. Analytical chemistry, statistical and computing support services are available on campus.

Candidates for graduate study must have a baccalaureate degree from an accredited college and have demonstrated capability to perform graduate-level work. Students are selected from among agronomy majors and others educated in the biological or physical sciences.

Financial assistance, available to qualified students at both the MS and PhD levels, includes fellowships and teaching and research assistantships. Research projects funded by the experiment station or by grants may provide an additional source of support for graduate students.

MASTER'S DEGREE

Students entering the program with an interest in crop science or genetics should have completed courses in botany, genetics, inorganic and organic chemistry, biochemistry, statistics, physics and advanced mathematics. Those planning to major in soil science should have completed courses in calculus, physics, geology, atmospheric science, and inorganic, analytical and organic chemistry. Inadequacies can be remedied through additional course work immediately after admission. A GPA of at least 3.0 (A = 4.0) in the last two years of undergraduate study is desirable.

The program consists of 30 credit hours selected from courses accepted for graduate credit in accord with Graduate School regulations; 15 or more hours must be in courses numbered 400 or above. Not more than 12 of the minimum 30 hours is permitted for research, problems, special investigations and special readings. At least 12 credits of agronomy courses in the 300 or 400 series or equivalent are included in the student's graduate and/or undergraduate program; nine credits are in the student's major area (crops and genetics or soils) and three are in the alternate area.

Most students' program includes a thesis, an original work which demonstrates a capacity for research and inde-

pendent thought. The non-thesis program, designed for those who have need for a broad range of agronomic knowledge, requires a written report on a special problem of three or four credit hours. The non-thesis program does not serve as a preparation for candidacy in a PhD program.

DOCTORAL DEGREE

A student may be admitted to the PhD program after completion of a master's degree program or its equivalent. Master's-level work must demonstrate the candidate's promise of becoming a capable investigator in a chosen field. All candidates must complete a qualifying examination.

The curriculum is developed by a five-member advisory committee, and generally includes 30 or more hours in graduate courses beyond those taken for the MS degree. There is no departmental foreign language proficiency requirement.

The advisory committee may grant one year of residence credit for the MS degree from another institution toward fulfilling the three-year residence requirement.

A comprehensive examination, including both written and oral performance, must be passed after successfully completing the program of study with a GPA of 3.0 (A = 4.0) or better.

The dissertation must be a substantial scholarly report of original research conducted by the student in a specialized area of agronomy.

the broad field of the morphological sciences. Teaching and research interests of the department include gross morphology, descriptive and experimental histology and embryology, endocrinology, chronobiology and neurosciences. The department also cooperates with the veterinary anatomy-physiology department to present a course of study for the PhD with research in veterinary anatomy.

The department is equipped to support investigations in many areas of morphology, cell biology and neurobiology. In addition to transmission and scanning electron microscopy, facilities for immunocytochemistry, radioimmunoassay, organ culture, neural transplantation, and computer assisted microscopic image analysis are housed within the department.

MASTER'S DEGREE

The master's program in anatomy is designed for students who wish to expand their knowledge of morphology and gain an introduction to research. Although there is no obligation to do so, a student may elect to secure a master's degree as preparation for the PhD degree. The master's program can also be tailored to meet the needs of students in allied health professions in nursing and medicine.

Applicants must have an undergraduate GPA of at least 3.0 (A = 4.0) or equivalent during the last two years of undergraduate work and an overall GPA of at least 2.75 to be admitted into the departmental graduate program. The candidate should have a minimum of 20 semester hours of biology and have taken chemistry (including inorganic and organic), general college physics and one year of college mathematics. As adequate preparation for the program, the department recommends that an applicant should have completed courses in comparative anatomy and statistics.

Applications for admission to the MA program must include complete transcripts of all college credits, test scores for the Graduate Record Examination, and letters of support from three professors who have taught courses to the applicant. The department requests test scores for the advanced biology portion of the GRE as well as those for the quantitative, verbal and aptitude portions. All materials should be addressed to the director of graduate studies, Department of Anatomy, Health Sciences Center, University of Missouri-Columbia, Columbia, Mo. 65212.

During the first academic year of the program the student will complete departmental courses in gross anatomy, microscopic anatomy, developmental anatomy and neurosciences, as well as courses in biochemistry and physiology. At the end of the second semester, the candidate should select a faculty advisor. The second year of the program is designed with the guidance of the advisor and advisory committee, and is devoted

to continued course work and preparation of a thesis. The candidate must take at least nine hours of course work at the 300-level or above, exclusive of thesis or problems courses. During the program, each candidate must have 15 hours or more in 400-level courses; no more than 12 hours in research, problems, special investigations and special readings may be counted in fulfilling this requirement.

DOCTORAL DEGREE

Candidates seeking entry into the PhD program should submit transcripts of all graduate and undergraduate credits, copies of GRE scores (aptitude, verbal, quantitative and advanced biology), and letters of support from at least three professors who have taught courses to the applicant. Where applicable, one of the letters should be from the master's advisor. After evaluation of this material, the department determines the acceptability of the candidate.

The following subjects are basic to the program and are required of all students: gross anatomy, microscopic anatomy, developmental anatomy, neuro-anatomy and biochemistry and physiology. Some students completing these courses during their earlier programs have fulfilled these requirements before entering the doctoral program.

A further course of study will be constructed by the student's advisor and advisory committee, taking into consideration the student's past record and designated area of concentration.

The department has established requirements for one foreign language and statistics. These are not considered part of the formal coursework creditable toward the degree, and the requirements may be satisfied by:

- a) Prior coursework acceptable to the department, or
- b) Elective courses taken for credit and passed with a grade of C or better, or
- c) For the foreign language, by successfully passing the examination administered by the UMC counseling service.

During the course of training, the student is expected to gain at least one semester of teaching experience in gross anatomy and in such subdisciplines recommended by the student's advisory committee.

Candidates are required to maintain at least B (3.0) grades and are allowed only one C (2.0) grade, except that no C grades are accepted in the core courses of the department.

After completion of most of the course work, two years of residence and the completion of the language requirement or language and collateral field requirement, a comprehensive examination is given. This examination, conducted by the candidate's advisory committee, contains both a written and an oral portion.

Each candidate initiates and completes an independent and original re-

ANATOMY School of Medicine

FACULTY

Willis K. Paull, professor, chairperson, PhD, University of Southern California

Larry Petterborg, assistant professor, director of graduate studies, PhD, University of Texas-San Antonio

J. Harry Cutts, professor, PhD, Western Ontario

David E. Scott, professor, PhD, University of Southern California

Herbert E. Brown, associate professor, PhD, University of Utah

John D. Decker, associate professor, PhD, S.U.N.Y.-Upstate New York

Finley P. Gibbs, associate professor, PhD, University of Oregon

William R. Goodge, associate professor, PhD, University of Washington

William J. Krause, associate professor, PhD, University of Missouri-Columbia

Barrie D. Smith, associate professor, PhD, University of Iowa

Gary B. Dunkerley, assistant professor, PhD, University of Texas, Medical Branch

P. Kevin Rudeen, assistant professor, PhD, University of Texas-San Antonio

Charles Turkelson, assistant professor, PhD, Tulane University

GRADUATE DEGREES OFFERED

MA in anatomy

PhD in anatomy

The Department of Anatomy offers courses of study at the graduate level leading to the degrees of master of arts and doctor of philosophy. These programs are designed to prepare students for careers as basic medical scientists in

search project that is worthy of publication, with the results of this research embodied in the doctoral dissertation. In addition to the three readers required by the Graduate School for dissertation approval, the department requires a fourth reader. This person, recommended by the candidate's advisor, must be a member of the UMC faculty. After the four readers have approved the dissertation, the advisory committee is convened to conduct a final oral examination.

ANCIENT STUDIES AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog

ANIMAL SCIENCE College of Agriculture

FACULTY

Bob D. Moser, professor, chairperson, director of graduate studies, PhD, University of Nebraska
J. Malcolm Asplund, professor, PhD, University of Wisconsin
Harold V. Biellier, professor, PhD, University of Missouri-Columbia
C. Melvin Bradley, professor, PhD, Oklahoma State University
Bill N. Day, professor, PhD, Iowa State University
George B. Garner, professor, PhD, University of Missouri-Columbia
John Massey, professor, PhD, University of Missouri-Columbia
W. H. Pfander, PhD, professor, associate dean, College of Agriculture, PhD, University of Illinois
John C. Rea, professor, PhD, University of Missouri-Columbia
James E. Ross, professor, MS, University of Missouri-Columbia
J.E. Savage, professor, PhD, University of Missouri-Columbia
Homer B. Sewell, professor, PhD, University of Kentucky
J.M. Vandepoliere, professor, PhD, University of Florida
Trygve L. Veum, professor, PhD, Cornell University
Larkin Langford, associate professor, MA, University of Missouri-Columbia
Glenn S. Geiger, associate professor, MS, University of Missouri-Columbia
George Jesse, associate professor, PhD, University of Missouri-Columbia
Ronald E. Morrow, associate professor, PhD, University of Tennessee
Dale Vogt, associate professor, PhD, University of Minnesota
Maurice Alexander, assistant professor, MS, University of Missouri-Columbia
Duane Kiesler, assistant professor, PhD, W. Virginia University
William Lamberson, assistant professor, PhD, University of Nebraska
R. Jerry Lipsey, assistant professor, PhD, Kansas State University
Wayne E. Loch, assistant professor, PhD, University of Missouri-Columbia
John A. Paterson, assistant professor, PhD, University of Nebraska
Mike F. Smith, assistant professor, PhD, University of Texas, A&M
James E. Williams, assistant professor, PhD, West Virginia University

GRADUATE DEGREES OFFERED

MS in animal science

PhD in animal science

The animal science department provides graduate programs leading to the

degrees of master of science and doctor of philosophy. A student may pursue any of the following areas of concentration: nutrition, physiology, genetics, growth and development, and production and management. These programs are designed to prepare students for advanced professional careers in academia (teaching, research and extension) and industry. Animal science is a broad and rapidly changing field demanding a wide variety of training. Accordingly, graduate programs include course work in biochemistry, genetics, management, microbiology, nutrition, physiology, statistics and computer science.

The department cooperates with scientists in government, industry and at other state and international institutions, with national and local firms and with the professional associations for these groups.

Facilities available for use in graduate research programs include a new 3.3 acre Animal Sciences Center which includes offices and laboratory space, small and large animal research units, climatic laboratory, surgery units, and departmental library containing scientific journals, periodicals and other references in the animal and poultry sciences. In close proximity are the research farms for beef cattle, swine, poultry, sheep and horses.

Opportunities to gain practical experience in teaching, research and extension is provided. Fellowship, scholarship and research assistantships are available on a competitive basis to qualified students. Additional information can be obtained from the department chairperson/director of graduate studies.

DEGREE REQUIREMENTS

A candidate for advanced degree must (1) meet Graduate School admission requirements; (2) have a BS in animal sciences or related area with a 3.0 GPA (4.0 basis); and (3) complete the principal courses required of UMC undergraduates majoring in each area of concentration. When necessary, students may enroll in graduate and needed undergraduate courses at the same time.

MASTER'S DEGREE

Thirty hours of graduate credit with a minimum of 24 hours course work plus a minimum of six hours of 490 research, and an approved thesis.

DOCTORAL DEGREE

For the PhD degree, an applicant must meet the admission requirements of the Graduate School. The nature of the qualifying examination is determined by the student's advisory committee.

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.

The language requirement for the PhD degree may be fulfilled by showing proficiency in two foreign languages or in one foreign language and one collateral field or in two collateral fields. A research technique may be substituted for a collat-

eral field. A dissertation is required of each candidate.

ANTHROPOLOGY College of Arts & Sciences

FACULTY

Peter M. Gardner, professor, chairperson, PhD, University of Pennsylvania
Robert F. G. Spier, professor, director of graduate studies, PhD, Harvard University
Robert A. Benfer, professor, PhD, University of Texas
Carl H. Chapman, professor, PhD, University of Michigan
Richard A. Diehl, professor, PhD, Pennsylvania State University
Louanna Furbee, professor, PhD, University of Chicago
James A. Gavan, professor, PhD, University of Chicago
Michael C. Robbins, professor, PhD, University of Minnesota
Ralph M. Rowlett, professor, PhD, Harvard University
H. Clyde Wilson, professor, PhD, University of California- Los Angeles
W. Raymond Wood, professor, PhD, University of Oregon
Glenn Hausfater, Adjunct Professor, PhD (biology), University of Chicago
Robert T. Bray, associate professor, MA, University of Missouri-Columbia
James W. Hamilton, associate professor, PhD, University of Michigan
Michael J. O'Brien, associate professor, PhD, University of Texas
Samuel D. Stout, associate professor, PhD, Washington University (St. Louis)
Jay D. Dix, adjunct assistant professor, MD, (pathology), University of Missouri-Columbia
Deborah M. Pearsall, research associate and adjunct assistant professor, PhD, University of Illinois-Urbana
David Price Williams, adjunct assistant professor, PhD, University of London, (director, Swaziland Archaeological Research Association)

GRADUATE DEGREES OFFERED

MA in anthropology

PhD in anthropology

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. The student pursues individual specialized study at the doctoral level.

The four recognized subfields of anthropology provide the areas of study for the graduate student. The doctoral candidate normally specializes in one of these or, in consultation with an advisory committee, chooses an area of specialization that cuts across some of the four recognized divisions or that includes some area outside traditional anthropology. These areas are (1) cultural anthropology: ethnohistory, technology, social anthropology, theoretical anthropology, psychological anthropology; (2) physical anthropology: behavior, growth and morphology, primatology, osteology, human evolution; (3) archaeology: sociocultural interpretation, experimental archaeology, field techniques and research, museology; and (4) linguistic anthropology: sociolinguistics, ethno-linguistics, linguistic reconstruction.

Training in methods of inductive and deductive procedures is provided for all fields. Computer-assisted research is

emphasized. The department is increasing its museum-oriented studies.

The anthropology department, which emphasizes training in research, maintains the Museum of Anthropology, a laboratory for thermoluminescence analysis of lithics, bone histology laboratory, skeletal collections of human and nonhuman primates, a comparative faunal collection for ecological studies and data on *Macaca mulatta*. Other research facilities include the Lyman Archaeological Research Center, the Hamilton Archaeological Field School and the Center for Research in Social Behavior.

Graduate students from the department have conducted research in Canada, the United States, Mexico, Guatemala, Peru, the Caribbean area, West and Central Europe, East Africa and the Middle East.

Teaching, research, and student assistantships, fellowships and scholarships are available to qualified graduate students of anthropology. Applications for financial assistance should accompany application for admittance to the graduate program and should be submitted no later than March 1 each year. Write for forms and additional information to director, Graduate Studies Committee, Department of Anthropology, 210 Switzer Hall.

MASTER'S DEGREE

Admission to the graduate program is not limited to students with undergraduate degrees in anthropology. However, an entering student should have had an introductory (general) course and first-level specialized courses in cultural anthropology, archaeology (or prehistory), linguistics and physical anthropology. Students with deficient backgrounds may be admitted as provisional candidates and must make up their deficiencies without graduate credit during the first year of graduate study. In addition, all students are required to have at least one course in statistics.

The basic standards for admission are a 3.25 (A = 4.0) GPA for the last 60 hours of undergraduate courses, and a score of 1000 on the GRE. These requirements may be waived in exceptional cases.

A program tailored to each student's educational objectives is planned by the student and the advisory committee. The course of study must include at least one graduate level course in each of the four subfields of anthropology. After 27 hours of graduate courses, the student must pass an MA final examination. This examination includes, but is not limited to, the material on the departmental MA reading list.

A thesis or formal project, for a maximum of 6 hours credit, is required for the master's degree.

DOCTORAL DEGREE

To be admitted to the doctoral program in anthropology, a student must show superior performance on the apti-

tude test of the GRE, have a master's degree, and a 3.5 or higher (A = 4.0) GPA in previous graduate work. Further, a faculty member 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.

Students must pass an oral qualifying examination during their first semester of graduate work. The examination is given by the student's advisory committee. After students successfully qualify for the PhD program, their status is "applicant for the PhD."

The PhD degree is primarily oriented toward research competence. Therefore, the student is judged on research promise and ability. The objective of course work is to produce an anthropologist with some competence in all fields, but with a special competence in a chosen field for purposes of teaching, research and evaluation of others' research.

The student's advisory committee is responsible for the student's program of study. This program shall include at least one foreign language appropriate to the student's area of specialization. There is no fixed requirement of courses, but most students amass 48 to 60 hours of graduate study beyond the MA.

PhD candidates are required to serve as teaching assistants for at least one semester or one summer session.

An applicant for the PhD normally takes a comprehensive examination at the end of the second year of the program. After students successfully pass the comprehensive examination, their status is "candidate for the PhD."

The PhD in anthropology is awarded after an accepted dissertation has been submitted and successfully defended in a final examination.

Application Deadline: All departmental application materials must be filed by March 1 each year for admittance in the fall semester.

ART College of Arts & Sciences

FACULTY

Frank H. Stack, professor, chairperson, MA, University of Wyoming

Donald L. Bartlett, professor, director of graduate studies, MFA, Cranbrook Academy of Art

Robert Bussabarger, professor, MA, Michigan State University

William A. Berry, professor, MFA, University of Southern California

Larry Kantner, professor, EdD, Pennsylvania State University

Lawrence Rugolo, professor, MFA, University of Iowa

Jerry D. Berneche, professor, MFA, University of Ohio

Elizabeth T. Montiminy, professor emeritus, BA, Radcliffe. Studied Art Students League

Brooke B. Cameron, associate professor, MA, University of Iowa

Robert M. Pringle, associate professor, MA, MFA, University of Kansas

Oliver Schuchard, associate professor, MFA, University of Southern Illinois

Jean Garrett, assistant professor, MFA, Chicago Art Institute

Marilyn Holsinger, assistant professor, MAT, Reed College

Stephen Lahr, assistant professor, EdD, University of Nebraska

GRADUATE DEGREES OFFERED

MFA in art

The Department of Art, with studio courses in drawing, design, graphic design, ceramics, jewelry, painting, photography, printmaking, sculpture and weaving, offers the master of fine arts degree. Students desiring to work toward the master of arts in education, doctor of education or doctor of philosophy, with art as a teaching field, should address inquiries to the College of Education.

Laboratory facilities are available in all media areas and there are a number of individual graduate studios for students working in special problems courses.

The art department gallery schedules regular exhibitions which provide an opportunity for students to experience and relate to a variety of traditional and contemporary art examples. UMC art collections, which include the Museum of Art History and Archaeology, are described in a separate section on resources and research. Ellis Library has extensive and excellent holdings of books, periodicals and reference materials pertaining to art and art history.

The department offers a number of teaching assistantships to qualified graduate students working toward degrees of master of fine arts, master of education or doctor of education. Non-teaching assistantships in various studio areas are also available.

The program leading to the master of fine arts degree is designed to provide superior preparation in the visual arts or design and crafts for those whose aim is professional work in the field of art or for those who plan to teach at the college level.

In addition to meeting the general requirements of the Graduate School and the admissions office, the applicant must have completed a bachelor of fine arts degree as established at this school, or its equivalent. Before admission to this program, the applicant must submit transcripts from each college or school of art attended and examples of work to the graduate committee of the art department. The committee evaluates the materials and determines the applicant's preparation and ability to undertake work for an advanced degree.

Examples of work to be submitted should emphasize the area in which the student intends to major. Examples of representational drawing (including figure drawing) must also be included. Students whose preparation in art is deficient, as determined by the graduate committee, are required to take additional work before proceeding with the graduate program. Upon acceptance, the student must report to the chairman of the departmen-

tal committee on graduate studies for assignment of an advisor.

The program for the degree is planned with an advisor in the area of specialization. Of the 60 credit hours required for the degree, 54 credit hours are in studio art courses with a minimum of 30 hours in double major (e.g. drawing, painting, design-crafts, etc.) and nine of these in the minor area. The remaining 15 hours of the 54 studio hours may be in studio courses outside the major area. The six hours not in studio art are taken in art history. A minimum of 30 credit hours must be in courses numbered 400 and above.

Candidates must complete a minimum of 18 hours in art history courses during the undergraduate and graduate years.

A minimum residence of two years is required for the degree. The degree will not be granted solely upon the completion of the prescribed number of credit hours and the residence requirement, but rather on the student's attainment of a high level of creative achievement.

A two-part thesis is required and must include (1) an exhibition selected and installed by the student to demonstrate his professional achievement and (2) a photographic record of the exhibition with a statement concerning the ideas and problems of the work displayed. Each degree candidate takes a two-hour oral examination which focuses on the candidate's thesis and aspects of academic study related to the thesis.

ART HISTORY AND ARCHAEOLOGY

College of Arts and Sciences

FACULTY

Vera B. Townsend, chairperson, associate professor, PhD, Emery University

Norman E. Land, associate professor, director of graduate studies, PhD, University of Virginia

William R. Biers, professor, PhD, University of Pennsylvania

Osmund Overby, professor, PhD, Yale University

Homer Thomas, professor emeritus, PhD, University of Edinburgh

Saul S. Weinberg, professor emeritus, PhD, John Hopkins University

Edward Baumann, associate professor, PhD, University of Vienna

Patricia Crown, associate professor, PhD, University of California Los Angeles

Howard W. Marshall, associate professor, PhD, Indiana University

Forrest McGill, assistant professor, PhD, University of Michigan

Kathleen Warner Slane, assistant professor, PhD, Bryn Mawr College

GRADUATE DEGREES OFFERED

MA in art history and archaeology

PhD in art history and archaeology

The Department of Art History and Archaeology offers the MA and the PhD degree in art history and archaeology. The MA degree may include museum training at the Nelson-Atkins Museum of Art in Kansas City, and the Museum of Art and Archaeology.

The UMC Museum of Art and Archaeology brings students in close contact

with original works of art. Its archaeological collection has much material from University-sponsored excavations. Excellent library facilities (books, photographs, slides) are also available.

For students admitted to the PhD program in art history, the Kress Foundation Fellowships carry stipends up to \$7,000 and are renewable. One or more travel fellowships are also granted each summer. Other assistantships and fellowships, with stipends ranging from \$2,220 to \$4,440, are available to graduate students. These have application deadlines of February 1. For more information, write the director of graduate studies, Department of Art History and Archaeology.

Of the limited number of persons admitted annually to the graduate programs, preference always is given to candidates for PhD degrees. Candidates must have a BA degree or its equivalent in art history, art, archaeology, classical languages or related fields of the humanities from a recognized institution. Applications accompanied by official GRE results and three letters of recommendations should be submitted before February 1 for the following fall semester.

MASTER'S DEGREE, THESIS OPTION

The master of arts degree qualifies the graduate for work in museums and for teaching positions in junior colleges.

The MA program in art history and in archaeology emphasizes a broad training through a diversification of courses. The minimum 30 credit hours must include 15 hours of 400-level courses with no more than 12 hours of readings or special problems. Only after being admitted to candidacy may students take courses numbered 480 and 490.

A formal interview is required for admission to candidacy for the master's degree. In this interview the thesis proposal is discussed. Application for an interview for candidacy may be made only after a student (1) fulfills the language requirements, (2) passes the qualifying examination, and (3) decides on a specific field for the master's thesis with the assistance of an advisor of the individual's own choice.

Candidates must demonstrate in written language examinations a proficiency in reading German and French or Italian. A passing score in the ETS Foreign Language Examination fulfills this requirement. Students in classical archaeology are expected to have a reading knowledge of both Greek and Latin in addition to German and French or Italian. Without meeting these requirements, no student will be admitted to seminars (except 401 and 402), nor be granted an interview for candidacy.

The qualifying examination is given once each semester. This examination must be taken by the second semester of residence in which a student is taking courses for graduate credit. The student is expected to pass the examination no

later than the third semester in residence. Students in art history must be familiar with key monuments of the art of the Western world, from Egypt to the present. For students in archaeology, a knowledge of key monuments of the ancient Near East, Egypt, Greece and Rome, is required.

A thesis is required. The student must submit a draft to the advisor at least two months before the final one is due. The final oral examination includes defense of the thesis and general questions in related fields.

The departments offers, in cooperation with the Nelson-Atkins Museum of Art in Kansas City, and the Museum of Art and Archaeology an MA degree combining art history and archaeology with museum training. All requirements for the MA degree, except the thesis, must be satisfied before a student can take up an internship. Simultaneously with this internship, a student takes reading courses with the department (480) and writes an MA thesis.

NON-THESIS OPTION (TEACHING)

The department also offers, in cooperation with related departments, an MA degree designed to prepare teachers in an interdisciplinary approach to humanities. The program differs from the regular departmental MA program; 40 hours of graduate-level work are required and comprehensive examination replaces the thesis requirement. While intended for those who plan to teach immediately, it is not the intent of the program to stress a dichotomy between teaching and research, and recipients of the degree will be considered for the doctoral program upon completion of a second language and thesis.

DOCTORAL DEGREE

For the PhD in both classical archaeology and art history, an MA is prerequisite. However, one may apply for the PhD degree initially, in which case the department reserves the right to require an MA thesis be written. During the first semester at UMC, students having MA degrees from other institutions must pass the department's qualifying examination. The language requirement for the PhD degree is the same as for the MA, plus a reading knowledge of any other language(s) necessary for preparation of the dissertation. Without the MA degree, 72 hours of course work are required; with the MA 48 hours are required.

A formal interview is required for admission to PhD candidacy and is granted only upon fulfillment of language and qualifying examination requirements and after a formal petition. Each student arranges a program of courses in close consultation with an advisor and with the approval of an advisory committee.

The comprehensive examination in the major and minor areas of art history and archaeology, predetermined by the student and the advisory committee, con-

sists of both oral and written examinations.

The dissertation is expected to be an original contribution to scholarship in the field. The final examination, in the form of an oral defense of the dissertation, tests the candidate's knowledge of the special field.

ATMOSPHERIC SCIENCE College of Agriculture

FACULTY

Wayne L. Decker, professor, chairperson, director of graduate studies, PhD, Iowa State University

Grant L. Darkow, professor, PhD, University of Wisconsin

Ernest C. Kung, professor, PhD, University of Wisconsin

Clarence M. Sakamoto, professor, PhD, Iowa State University

Sharon K. LeDuc, associate professor, PhD, University of Missouri-Columbia

Stephen E. Mudrick, associate professor, PhD, Massachusetts Institute of Technology

GRADUATE DEGREES OFFERED

MS in atmospheric science PhD in atmospheric science

The Department of Atmospheric Science offers graduate work leading to the degrees of master of science and doctor of philosophy. Graduate programs are designed to prepare students for professional careers in research and/or teaching in both the basic and applied aspects of the science. Because of the interdisciplinary nature of meteorology, study programs include course offerings of other departments, particularly those in the physical and mathematical sciences. Students with undergraduate education in atmospheric science, earth sciences, physics, mathematics, engineering, statistics or biology may qualify for admission.

Each graduate student is required to participate in one of the departmental research areas. Current areas of study include dynamical and physical meteorology; the general circulation; cumulus dynamics; statistical climatology and applied meteorology; the energetics of the general circulation; the dynamics of cumulus clouds and severe storms; biometeorology with emphasis on the environmental impact on crop production and water utilization; the social and economic impact of climate variabilities; climatological expectancies; and the mesoscale and macroscale dynamics of the free atmosphere.

The department has specialized computer data files which support the thesis and dissertation research in both macroscale and large scale dynamical research. There are also computerized climatic data systems for use in applied meteorological problems. Graduate research is supported by department's affiliation with the National Oceanic and Atmospheric Administration through the Cooperative Institute for Applied Meteorology which is located on the Columbia campus. There is an opportunity for joint programs with the Graduate Center for Cloud Physics

at University of Missouri-Rolla. The University is a member institution of the University Corporation for Atmospheric Research. Since UCAR manages the National Center for Atmospheric Research, graduate students and staff are involved with the programs of NCAR.

A limited number of fellowships, scholarships and graduate assistantships are available to qualified graduate students. Those interested in applying should write the director of graduate studies, Department of Atmospheric Science, 701 Hitt St., UMC, Columbia, Mo. 65211.

MASTER'S DEGREE

To qualify for the MS program, a student's undergraduate degree program should include mathematics through integral calculus and at least one year of college physics. Additionally, an applicant should provide two references from faculty members and GRE scores.

At least 30 hours of graduate credit must be completed, in accordance with Graduate School regulations, to satisfy degree requirements. There is no language requirement. A candidate must submit an acceptable thesis. A final examination covering the thesis and other graduate work completes the requirements. This examination may be oral, or written and oral, depending on the examining committee's recommendations.

DOCTORAL DEGREE

Students entering the doctoral degree program should have a master's degree or equivalent. Students transferring from other institutions are required to take a written qualifying examination.

The program of study is presented by the student and doctoral advisor to a planning committee selected from the Department of Atmospheric Science and related areas. The planning committee is responsible for approval of a program of study and for identifying additional required academic or research related skills.

Candidates must successfully complete the general requirements for the PhD as presented in this catalog.

BIOCHEMISTRY College of Agriculture/ School of Medicine

FACULTY

Milton S. Feather, professor, chairperson, PhD, Purdue University

Joseph Polacco, assistant professor, director of graduate studies, PhD, Duke University

Eric G. Brunngraber, professor, PhD, University of Wisconsin

Benedict J. Campbell, professor, PhD, Northwestern University

George B. Garner, professor, PhD, University of Missouri-Columbia

Charles W. Gehrke, professor, PhD, Ohio State University

Camillo A. Ghiron, professor, PhD, University of Utah

Arlene P. Martin, professor, PhD, University of Rochester

Boyd L. O Dell, professor PhD, University of Missouri-Columbia

Beryl J. Ortworh, professor, PhD, University of Missouri-Columbia

Edward E. Pickett, professor, PhD, Ohio State University

Douglas D. Randall, professor, PhD, Michigan State University

Marie L. Vorbeck, professor, PhD, Cornell University

Arnold A. White, professor, PhD, Georgetown University

Robert L. Wixom, professor, PhD, University of Illinois

Thomas D. Luckey, professor emeritus, PhD, University of Wisconsin

John M. Franz, associate professor, PhD, University of Iowa

Russell L. Larson, associate professor, PhD, University of Illinois

Ezio A. Moscatelli, associate professor, PhD, University of Illinois

William D. Noteboom, associate professor, PhD, University of Illinois

Jeffrey Robbins, associate professor, PhD, University of Connecticut

Francis J. Schmidt, associate professor, PhD, University of Wisconsin

David B. Shear, associate professor, PhD, Brandeis University

Albert Y. Sun, associate professor, PhD, Oregon State University

Grace Y. Sun, associate professor, PhD, Oregon State University

Wynn A. Volkert, associate professor, PhD, University of Missouri-Columbia

Judy D. Wall, associate professor, PhD, Duke University

Warren L. Zahler, associate professor, PhD, University of Wisconsin

Creighton N. Cornell, assistant professor, DVM, University of Missouri-Columbia

David W. Emerich, assistant professor, PhD, University of Wisconsin

Mary Finkelstein, assistant professor, PhD, New York University

Ingming Jeng, assistant professor, PhD, University of California-Berkeley

Takeshi Kagawa, assistant professor, PhD, University of California-Santa Cruz

Mary Polacco, assistant professor, PhD, Duke University

GRADUATE DEGREES OFFERED

MS in biochemistry PhD in biochemistry

COOPERATIVE DEGREES

MD/MS in biochemistry MD/PhD in biochemistry

INTERDISCIPLINARY AREA PROGRAM

PhD in nutrition area program

The Department of Biochemistry offers master of science and doctor of philosophy graduate programs designed to prepare students for professional careers as biochemists in industry, government and teaching institutions.

Almost every aspect of biochemistry is represented in the research interests of the faculty. Students determine their research adviser. The areas of concentration include enzyme reaction mechanisms, peptide synthesis, hormonal control mechanisms, growth factor identification, analytical biochemical methodology, photochemistry of proteins and nucleic acids, developmental biochemistry, lipid metabolism, molecular biology, membrane biochemistry, plant metabolism, bio-chemistry of cancer, induced enzymes, metal ion interaction with proteins, and cloning of eukaryotic and prokaryotic genes.

The department has laboratories located principally in the Chemistry and the Medical Sciences buildings.

All students have supervised teaching experience that is correlated with course work and research in individually planned programs. Students are expected to complete courses in selected areas of modern biology and chemistry, as well as in biochemistry.

Assistantships and fellowships are available each year. For information regarding these and application forms for admission to the department, write the director of graduate student admissions, Department of Biochemistry, 322A Chemistry Building, UMC, Columbia, MO 65211.

MASTER'S DEGREE

The following entrance requirements must be met: mathematics (through differential and integral calculus), biological sciences (at least one course), one year of physics, general chemistry, quantitative analysis, one year of organic chemistry (with a laboratory), a physical chemistry course with a calculus prerequisite, and one year of biochemistry (with a laboratory). Preferably these prerequisites will have been met during undergraduate studies; however, some may be made up after acceptance as a graduate student. After a student's acceptance, both standardized tests and committee advising will be employed in order to place the student in appropriate courses.

The minimum department course requirements for the master's of science degree are: six hours of intermediate biochemistry, one hour of biochemistry seminar (410), four hours of biochemistry research (490) and one graduate-level course in an area outside the department. Other requirements include a thesis based upon original research, a final oral examination, a public seminar based on thesis material and some teaching. A student is expected to complete an MS degree within a 24-month period. Students receiving financial assistance can expect no more than two years funding toward the MS degree.

DOCTORAL DEGREE

Entrance requirements for acceptance into the PhD program are the same as those stipulated for the MS degree. Normally, a required departmental comprehensive examination is taken at the end of the second academic year of graduate study.

The minimum departmental course requirements for the PhD are: 9 hours of intermediate biochemistry, 4 hours of seminar (410), two advanced biochemistry courses, two courses in biology beyond the entrance requirements, and 6 hours of 300-or-400-level course work in another department. Additional requirements include teaching experience, a dissertation based upon original research, a thesis seminar and a final examination.

The average residency of a student with a baccalaureate degree is four and

one-half years; for a student with a master's degree it is generally three years. Students receiving financial assistance can expect no more than a total of five years of funding during study toward the PhD degree.

MS/MD AND PhD/MD DEGREE PROGRAMS

Students already accepted into the UMC School of Medicine may apply to the department for acceptance into the MS/MD or the PhD/MD program. Students matriculating in either the PhD or MS degree programs must complete degree requirements before entering the UMC School of Medicine.

BIOCHEMISTRY & NUTRITION

The precise course of study is determined by the interests and needs of the student. In all cases the minimal requirements for the MS degree are physiological chemistry (Biochemistry 270, 272, 274 or equivalent-6 hours), statistics (6 hours), research (5-8 hours to culminate in a thesis), and electives in courses numbered 400 or above (8-11 hours, with a minimum of 5 hours in biochemistry).

Research activities are chosen from such areas as interactions between biochemical nutrition and disease, effects of stress on metabolism and other problems related to nutritional biochemistry.

Work for the PhD degree in biochemistry and nutrition can be accomplished in the department under the authority of the area program in nutrition.

BIOLOGICAL SCIENCES College of Arts and Sciences

FACULTY

Don Miles, professor, director, PhD, University of Indiana
Louis A. Sherman, professor, associate director, PhD, University of Chicago
John D. David, associate professor, director of graduate studies, PhD, Vanderbilt University
Paul F. Agris, professor, PhD, Massachusetts Institute of Technology
Robert P. Breitenbach, professor, PhD, University of Wisconsin
Allan B. Burdick, professor, PhD, University of California-Berkeley
Billy G. Cumbie, professor, PhD, University of Texas
Roger M. deRoos, professor, PhD, University of California-Berkeley
David B. Dunn, professor, PhD, University of California-Los Angeles
Abraham Eisenstark, professor, PhD, University of Illinois
H. Carl Gerhardt, professor, PhD, University of Texas
Charles S. Gowans, professor, PhD, Stanford University
Arthur P. Harrison, professor, PhD, University of Maryland
Glenn Hausfater, professor, PhD, University of Chicago
Phillip H. S. Jen, professor, PhD, Washington University (St. Louis)
Clair L. Kucera, professor, PhD, Iowa State University
Dan Mertz, professor, PhD, University of Texas
Dean E. Metter, professor, PhD, University of Idaho
Donald L. Riddle, professor, PhD, University of California-Berkeley
Richard Wang, professor, PhD, University of Colorado
Joseph M. Wood, professor, PhD, University of Indiana
Armon E. Yanders, professor, PhD, University of Nebraska
James E. Carrel, associate professor, PhD, Cornell University

Linda F. Chapman, associate professor, PhD, University of California-Los Angeles

John R. Faaborg, associate professor, PhD, Princeton
Donald H. Hazelwood, associate professor, PhD, Washington State University

Gary Y. Kikudome, associate professor, PhD, University of Illinois

George Smith, associate professor, PhD, Harvard University

William S. Stark, associate professor, PhD, University of Wisconsin

Frederick vom Saal, associate professor, PhD, Rutgers
Jack Twente, associate professor, PhD, University of Michigan

Felix Breden, assistant professor, PhD, University of Chicago

Miriam Golomb, assistant professor, PhD, University of California-Berkeley

James Lewis, assistant professor, PhD, University of California-Berkeley

William Lower, assistant professor, PhD, University of California-Berkeley

Joel Maruniak, assistant professor, PhD, University of Texas at Austin

Kathleen J. Newton, assistant professor, PhD, Indiana University

Gerald Summers, assistant professor, PhD, University of Illinois at Urbana-Champaign

Leslie S. Uhazy, assistant professor, PhD, Guelph

GRADUATE DEGREES OFFERED

MA in biological sciences

PhD in biological sciences

The Division of Biological Sciences offers a program of graduate study leading to the degrees of master of arts and doctor of philosophy in biological sciences. Faculty in the division also participate in the genetics area program and the microbiology area program.

General areas of research emphasis within the division include genetics, cell and developmental biology, microbiology, molecular biology, physiology, ecology, evolution, neurobiology, behavior, systematics, organismal biology, plant sciences and zoology. Within these general areas students may devise more specific graduate programs in, for example, plant physiology, invertebrate chemical communication, neurophysiology, etc. Several students are currently involved in established interdepartmental programs in neurosciences, genetics, plant biochemistry and physiology, cellular and molecular biology, microbiology and physiology. In addition, the presence on this campus of a School of Medicine, School of Agriculture and School of Veterinary Medicine provide unique opportunities for direct interaction with a wide variety of established research scientists.

It is expected that all entering graduate students will have a broad background in biology and will in addition have completed courses in mathematics through integral calculus, chemistry through organic chemistry, and a year of physics. Exceptions may be made for individual students but deficiencies must be removed within the first year of graduate study. Outstanding students with undergraduate degrees in areas other than biology (e.g., chemistry, physics, mathematics, psychology, etc.) are encouraged to apply with the understanding that subject matter deficiencies in biology will be addressed in the first year of graduate study.

Financial support is available through research training grants, fellowships, scholarships, graduate research or teaching assistantships. In addition, non-resident tuition charges are waived for all students receiving financial support and a number of divisional scholarships to cover the remaining tuition and fees are available. For more detailed information on stipend level and availability of various kinds of financial support, including University fellowships for superior students, contact the director of graduate studies.

The Division of Biological Sciences occupies 80,000 square feet of research and teaching space in Tucker Hall and Lefevre Hall, both of which are adjacent to buildings that house the chemistry and physics departments as well as related departments in the College of Agriculture and School of Forestry, Fisheries and Wildlife. The Colleges of Medicine and Veterinary Medicine are within short walking distance. Special research units with which our division has cooperative research programs are on or near the campus and include the Dalton (biological) Research Center, the Nuclear Reactor, the Laboratory for Biological Control of Insects, the Columbia National Fisheries Research Laboratory, the State Cancer Research Center, the Environmental Trace Substances Laboratory, the Eye Research Center, the Agricultural Experiment Station Laboratories, and the Sinclair Comparative Medicine Research Farm for Studies in Chronic Disease and Aging.

In addition to the specialized equipment in each faculty research laboratory, departmental equipment and facilities include: a Siemens Electron Microscope; a 250,000 specimen herbarium; five greenhouses; a 14-acre botany preserve on the campus and a 160-acre prairie research station; 24 walk-in plant growth chambers with regulated light; temperature and humidity controls; animal care facilities suitable for bats, rats, rabbits and birds; cell and tissue culture facilities; growth chambers; DNA sequencing and recombinant DNA facilities; scanning spectrophotometers and kinetic fluorimeters; ultracentrifuges; HPLC facilities; sound isolation acoustic chambers; neurophysiological recorders, oscilloscopes and amplifiers; and microneurosurgery facilities and equipment. Divisional faculty have ready access to the campus computing network (Amdahl 470 V/7, and Amdahl 470 V/8) in addition to microcomputers in their laboratories.

MASTER'S DEGREE

Each candidate for the master's degree is required to complete a minimum of 30 hours of credit beyond the bachelor's degree, selected from courses carrying graduate credit and including at least one course in which the candidate will present a seminar. Candidates must also satisfactorily complete a research project, thesis and oral thesis defense. Most stu-

dents require two years to complete the work for a master's degree.

DOCTORAL DEGREE

Each candidate for the doctoral degree is required to complete a minimum of 72 hours of credit beyond the bachelor's degree, selected from courses carrying graduate credit and including at least two courses in which the candidate will present a seminar. Candidates must satisfactorily complete a qualifying exam, written comprehensive examination, research project, thesis and oral thesis defense. Because many students eventually pursue both research and teaching careers, all doctoral candidates are required to gain teaching experience by assisting a professor in one lecture/laboratory course for two semesters sometime during their graduate training, regardless of their source of financial support. This normally requires two afternoons a week and course assignments are made in consultation with the student and the student's advisor. Requirements for the PhD degree are generally completed within 4 to 5 years.

BLACK STUDIES AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

BUSINESS ADMINISTRATION College of Business and Public Administration

FACULTY

Stanley J. Hille, professor of marketing, dean, College of Business and Public Administration, PhD, University of Minnesota
Robert V. Penfield, associate professor of management, associate dean, College of Business and Public Administration, director of graduate studies, PhD, Cornell University
Ronald E. King, instructor of management, assistant dean, College of Business and Public Administration, EdS, Southeast Missouri State University
Everett E. Adam, Jr., professor of management, DBA, University of Indiana
Carl E. Block, professor of marketing, PhD, University of Iowa
Earl A. Cecil, professor of management, director of management development programs, PhD, University of Indiana
Ronald J. Ebert, professor of management, DBA, University of Indiana
Donald S. Holm Jr., professor of management, UM assistant vice-president for finance & treasurer, PhD, University of Indiana
Earl F. Lundgren, professor of management, PhD, University of Wisconsin
John J. Pascucci, professor of finance, PhD, Stanford University
James Patterson, professor of management, DBA, University of Indiana
Robert R. Schooler, professor of marketing, PhD, University of Texas
Donald L. Shawver, professor of marketing, PhD, University of Illinois
E. Allen Slusher, professor of management, PhD, University of Iowa
William B. Wagner, professor of marketing, PhD, Ohio State University

James A. Wall Jr., professor of management, PhD, University of North Carolina
Don R. Webb, professor of marketing, PhD, University of Illinois
David A. West, professor of finance, PhD, University of Arkansas
Allen D. Bluedorn, associate professor of management, PhD, University of Iowa
Fredric J. Carlson, associate professor of business administration, Whiteman AFB graduate program in business, PhD, St. Louis University
Douglas R. Emery, associate professor of finance, PhD, University of Kansas
Myron L. Erickson, associate professor of management, JD, University of Wisconsin
Adam K. Gehr, Jr., associate professor of finance, PhD, Ohio State University
Glenn N. Pettengill, associate professor of business administration, Whiteman AFB graduate program in business, PhD, University of Arkansas
Rodney C. Sherman, associate professor of business administration, resident director, Whiteman AFB graduate program in business, PhD, Georgia State University
John D. Stowe, associate professor of finance, PhD, University of Houston
Gary L. Trennepohl, associate professor of finance, chairman, DBA, Texas Tech University
Albert R. Wildt, associate professor of marketing, chairman, Bailey K. Howard chair in marketing, PhD, Purdue
Marsha M. Boyd, assistant professor of marketing, MS, University of Illinois
Thomas W. Dougherty, assistant professor of management, PhD, University of Houston
Van Dyke Gray, assistant professor of business administration, Whiteman AFB graduate program in business, PhD, North Texas State University
Paul L. Gronewaller, assistant professor of finance, MBA, University of Nebraska-Lincoln
Susan E. Jordan, assistant professor of finance, MBA, University of Georgia
Thomas L. Keon, assistant professor of management, PhD, Michigan State University
Richard H. Kolbe, assistant professor of marketing, PhD, University of Cincinnati
Akella Rao, assistant professor of finance, PhD, Northwestern University
Dale E. Rude, assistant professor of management, PhD, University of Iowa
John W. Vann, assistant professor of marketing, PhD, University of Florida
Janet S. Adams, instructor of business administration, Whiteman AFB graduate program in business, MBA, Berry College

GRADUATE DEGREES OFFERED MBA

PhD in business administration

COOPERATIVE DUAL DEGREES

MBA and MS in public health

with an emphasis area in health services management

MBA and JD

MBA and MS in industrial engineering

The master of business administration and the doctor of philosophy in business administration are offered by the School of Business of the College of Business and Public Administration through the Departments of Finance, Management and Marketing. A master's candidate will select advanced course work from the offerings of these departments. A PhD candidate selects one of the departments as the area in which to concentrate course work and write a dissertation.

The School of Business faculty is housed in Middlebush Hall. Students have terminal access to the University computer network's AMDAHL 470/V7 and IBM 3031 processor, and full access to the resources of the Public Affairs

Information Service of the College and to Ellis Library.

MBA DEGREE

The MBA degree is designed for superior graduate students whose primary interest is preparation for managerial careers in business. It provides a strong educational background for persons who plan to continue their academic training in preparation for teaching and research in business administration. Although major emphasis is placed on the essential unity and interrelation of all business operations, the program provides for a concentration in one area of work.

The program is open to students who hold a baccalaureate degree in any discipline from an accredited school. Undergraduate grade point average and performance on the Graduate Management Admissions Test (GMAT) are the prime factors considered in admission decisions. In exceptional cases work experience, motivation and maturity are taken into consideration. A foreign student whose native language is not English is required to present a minimum score of 575 on the Test of English as a Foreign Language (TOEFL). Both the GMAT and TOEFL are administered by the Educational Testing Service.

Total graduate course work necessary to qualify for the MBA degree may vary from 30 to 54 semester hours, depending upon the nature and quality of a student's undergraduate preparation. The first year of the program consists of a series of graduate core courses, which draw upon subject matter normally covered in undergraduate courses in business and related disciplines. However, the scope and method of coverage is more demanding and is directed toward the maturity of the graduate student. A core course may be waived for a student whose undergraduate record indicates courses covering substantially the same materials have been completed.

First-year courses total 27 hours of work in the following subjects: calculus, organization theory and behavior, accounting, computer programming, statistics, micro-macro economics, operations management, finance and marketing.

The second year of the program requires at least 27 hours (30 hours if all core courses are waived), consisting of 24 at the 400-level and including specific courses in managerial decision science and business policy. Each student must complete an area of concentration in one of the following: administrative management, finance, human resource management, management of information systems, marketing or operations management.

In selecting second-year courses, a student should observe the following restrictions:

(1) the program must include at least 3 hours of 400-level work in each of the

following disciplines: finance, management, marketing;

(2) a program may not include more than 15 hours of course work offered by one department; and

(3) a program may include 3 hours of 300-level required first-year course work which carries a Business Administration designation and is taken in an area other than those from which 400-level courses are completed in satisfaction of (1) above;

(4) not more than 6 hours of advanced work may be transferred toward the second year requirements from another university, and that university must be accredited at the master's level by the American Assembly of Collegiate Schools of Business.

The MBA degree does not require a thesis or a language, but a number of second-year courses emphasize research projects and analytical reports.

In cooperation with the Graduate School and the Air Force Institute of Technology, the School of Business conducts at Whiteman Air Force Base a Minuteman Educational Program leading to the master of business administration degree. This program has the same requirements as the resident program.

Limited financial assistance from research and teaching assistantships is available. These assistantships are usually quarter time appointments involving 10 hours of work per week at approximately \$2,625 annually.

Applications and additional information about the program may be obtained by writing the director of graduate studies in business.

DOCTORAL DEGREE

The doctor of philosophy in business administration is designed to provide: (1) a broad understanding of the major areas of business; the role of the business manager as analyst, planner and decision maker; the mutual dependence between the firm and its environment; (2) intensive preparation for teaching in a specialized area at the college or university level with emphasis upon the dynamics of the discipline; and (3) competence for original research and awareness of the importance of self-development and scholarly growth.

The PhD program is open to students who have exhibited outstanding performance in previous academic work, have superior test scores from the GMAT and display the maturity and potential required for making scholarly contributions to their field of interest. To apply for permission to begin course work leading to the PhD degree, applicants must submit the following: transcripts from all colleges and universities attended; a score from the Graduate Management Admissions Test; a score from the Test of English as a Foreign Language (TOEFL) if a foreign student; three letters of recommendation from persons who can attest to the student's abilities; and a state-

ment by the applicant indicating the intended major area of study, career objectives and any other information deemed pertinent for consideration by the admissions committee. Formal admission to the PhD program in business administration requires satisfactory performance on a doctoral qualifying examination taken during the student's first semester of study.

During the first semester of course work, students must arrange with a member of the doctoral faculty from their major area of study to serve as chairman of an advisory committee. This committee, appointed after student/faculty consultation, consists of five members, with a minimum of two members from the student's major area of study and a minimum of one member from each of the student's supporting areas of study. The advisory committee conducts the qualifying examination and works with the student to design a program of study.

All programs of study must include the four groups of requirements listed below:

1. any first-year and required second-year MBA courses, or equivalents, that have not been completed prior to admission;

2. a concentration of 15 hours of 400-level courses in the area of finance, management or marketing;

3. two supporting areas of at least 9 hours each, one of which must be taken outside the School of Business;

4. a 21-hour collateral emphasizing the analytical tools for business. Proficiency in a foreign language does not fulfill the collateral requirements. Courses in the collateral are in addition to those listed in 1, 2 and 3, above, and must include the following:

- a) Business Administration 481-Research Design and Methodology;
- b) Economics 451-Advanced Price Theory, *and* Economics 453-Advanced Income Analysis; *or* Business Administration 471-Behavioral Science in Business I, *and* Business Administration 472-Behavioral Science in Business II;
- c) a 12-hours mathematical statistics/quantitative sequence approved by the director of graduate studies in business

These four groups of requirements are independent of each other; courses taken to satisfy one may not be used to satisfy any other. Graduate work taken before admission to the PhD program may be used to satisfy these requirements if approved by the advisory committee.

Oral and written comprehensive examinations covering the major area and the supporting areas are administered after the candidate has completed all course work of the official study program. A doctoral dissertation, for which a student earns a minimum of 12 hours and a

maximum of 24 hours credit, is required of each candidate. A final oral examination is held at the completion of the dissertation, and is concerned primarily with the research accomplished by the student while writing a dissertation.

If more than four years elapse between the time the student satisfies the comprehensive examination committee requirements and completion of the dissertation, both written and oral comprehensive examinations must be retaken.

In order to be eligible to receive a PhD degree offered by the UMC faculty, students are required to have the equivalent of three complete years of graduate work beyond the bachelor's degree. This must include at least two 12-hour or three 8-hour semesters of graduate-level work completed within an 18-month period on the UMC campus. A minimum of three years normally is required to complete the PhD in business administration.

Limited financial assistance through research and teaching assistantships is available. These assistantships are usually half-time appointments involving approximately 20 hours of work per week, and range from \$5,200 to \$9,000 annually.

Applications and additional information about the PhD program may be obtained by writing the director of graduate studies, School of Business, Middlebush Hall, UMC, Columbia, Mo. 65211.

CHEMICAL ENGINEERING College of Engineering

FACULTY

George W. Preckshot, professor, chairperson, PhD, University of Michigan

L. E. Marc deChazal, professor, director of graduate studies, PhD, University of Oklahoma

Richard H. Luecke, professor, PhD, University of Oklahoma

Truman S. Storvick, Black & Veatch professor of engineering, PE, PhD, Purdue University

Dabir S. Viswanath, professor, PhD, University of Rochester

Thomas R. Marrero, associate professor, PhD, University of Maryland

David G. Retzlaff, associate professor, PhD, University of Pittsburgh

R. K. Bajpai, assistant professor, PhD, Indiana Institute of Technology, Kanpur.

P.C.H. Chan, assistant professor, PhD, California Institute of Technology

GRADUATE DEGREES OFFERED

MS in chemical engineering

PhD in chemical engineering

The Department of Chemical Engineering offers graduate work leading to the degrees of master of science and doctor of philosophy. Information on engineering licensure is detailed in the general Graduate School section under PROFESSIONAL ENGINEERING REGISTRATION. Areas of study in the department are non-ideal fluid mechanics, rheology, process control and optimization, reaction kinetics, catalysis, heat transport (boiling, convective, condensation), phase equilibria, bio-oxidation, Newtonian fluid mechanics, applied mathematics to chemical engineering problems, mass transport (vibrating and non-vibrating

systems), thermodynamics, transport properties of gases, heat and mass transfer, high pressure properties of liquids and gases, plasma processing research, biologically oriented engineering research, air pollution monitoring and control, energy resource and production, and biochemical engineering research.

Research students have use of excellent facilities including an equation of state and transport properties laboratory, with computer data logging and control; a heterogeneous catalysis, reaction kinetics and fuel cell laboratory; a heat and mass transport laboratory; an air pollution monitoring and control laboratory; a water pollution control laboratory; a biochemical engineering laboratory; a non-Newtonian fluid mechanics laboratory; an interfacial mechanics laboratory; and transport properties and phenomena laboratory. Excellent library facilities provide the latest domestic and foreign journals, specific to chemical engineering and physical sciences research.

Research and teaching assistantships are available to qualified students for academic year and summer periods. The academic year stipend for a half-time appointment is \$6,500, and the student is subject to the incidental fee and any other fees that may be applicable.

The half-time appointment permits 12 credit hours of advanced study per semester. Academically qualified students may receive additional scholarship awards. Grant research assistantships and some industrial and Graduate School fellowships also are available. The applicant's academic record and research potential determine the financial assistance offered. A program of support for three years is offered to highly qualified PhD candidates. All of these permit the student to carry a full schedule of 16 semester hours. Financial assistance for students who wish to continue their study during the summer session is usually available. This assistance amounts to approximately 20 percent of the stipend for the academic year and in many cases there is full-time support for the two-month summer session.

MASTER'S DEGREE

To be accepted for advisement, a student must have completed a chemical engineering undergraduate curriculum or its substantial equivalent, at a school accredited by the American Institute of Chemical Engineers, and must hold a BS degree in chemical engineering. Graduates holding degrees in physics, chemistry, applied mathematics and related fields also may be considered for candidacy, but usually are required to take additional course work.

For admission to the chemical engineering graduate program, applicants should have a minimum of 2.75 overall GPA ($A = 4.0$) in undergraduate work. Consideration is given to grade trends, performance in the area of chemical engineering and mathematics and other cri-

teria bearing on a student's probable success in graduate study. Selected students with less than a 2.75 overall GPA may be considered on a probationary basis. Financial support is competitive and a 3.0 GPA is required. No financial support is available for probationary students.

The GRE is required which if not taken before entrance, must be taken the first semester of residence.

There is no foreign language or collateral requirement for the master's degree. Degree requirements are 30 hours, including research. Each student participates in seminars. An individual program prepared by the student and adviser includes advanced courses in chemical engineering and mathematics, and not more than 12 hours of research or other unscheduled work. There are considerable varieties of research projects available.

A thesis is required. A candidate completes the master's program by passing an examination in defense of this thesis.

DOCTORAL DEGREE

An applicant for the PhD program must pass a qualifying examination at a determined level of proficiency.

In consultation with the thesis adviser, a comprehensive two-year program of course work is prepared by each student. One or two languages may be included if the adviser decides they are necessary. The department requires a 3.0 GPA.

Before being admitted to candidacy and proceeding to prepare a dissertation the student must pass a comprehensive examination. The exam involves the assignment of a project requiring original and

creative work in delineating a research problem of some substance. It must be completed within a 30-day period.

A dissertation is required of all candidates. A final oral examination is held when the candidate defends the dissertation.

CHEMISTRY College of Arts and Science

FACULTY

S. R. Koirtiyohann, professor, chairperson, PhD, University of Missouri-Columbia

Robert E. Harris, associate professor, director of graduate studies, PhD, University of California

John E. Bauman Jr., professor, PhD, University of Michigan

Edwin M. Kaiser, professor, PhD, Purdue University

Hyunyoung Kim, professor, PhD, University of California

Robert R. Kuntz, professor, PhD, Carnegie Institute of Technology

Richard N. Loeppky, professor, PhD, University of Michigan

Stanley E. Manahan, professor, PhD, University of Kansas

John P. McCormick, professor, PhD, Stanford University

R. Kent Murmann, professor, PhD, Northwestern University

Elmer O. Schlemper, professor, PhD, University of Minnesota

Scott Searles Jr., professor, PhD, University of Minnesota

Richard C. Thompson, professor, PhD, University of Maryland
David E. Troutner, professor, PhD, Washington University (St. Louis)
Jerome W. O'Laughlin, associate professor, PhD, Iowa State University
Tuck C. Wong, associate professor, PhD, University of Michigan
John E. Adams, assistant professor, PhD, University of California
Paul R. Sharp, assistant professor, PhD, Massachusetts Institute of Technology
Michael S. Tempesta, assistant professor, PhD, University of Arizona
Pierre Crabbe, adjunct professor, PhD Strasbourg (France)

GRADUATE DEGREES OFFERED

MS in chemistry
PhD in chemistry

INTERDISCIPLINARY AREA PROGRAM

MS in physical science
MST in physical science

The Department of Chemistry offers course work leading to the degrees of master of science and doctor of philosophy in chemistry. The department, with the Departments of Physics and Mathematics, also offers graduate work leading to the degree of master of science in physical science. Designed for those planning to teach in junior colleges, the latter degree requires 40 hours of course work and no thesis.

The department offers areas of concentration in analytical, inorganic, organic and physical chemistry, as well as interdisciplinary programs with the biological, environmental, medicinal and other physical sciences. Well equipped research laboratories and facilities which contain standard and specialized equipment for research are maintained in these areas. An NMR center equipped 300 MHz and 90 MHz instruments is located in the chemistry building.

Other campus facilities widely used by the department include a central instruments shop, glass blowing shop, electronics shop, large computing center and ten megawatt nuclear reactor. The latter provides a high neutron flux for radioisotope and activation analysis. A Co⁶⁰ γ-ray source for radiation damage studies also is located at the reactor. For departmental faculty and graduate students, several laboratories are available on a continuing basis as their research requires.

Fellowships and research assistantships are available for highly qualified applicants. Departmental teaching assistantships also are awarded. Application forms, which may be obtained from the department chairperson, should be submitted no later than April 1 of each year.

GRADUATE DEGREE REQUIREMENTS

An applicant for graduate work in chemistry should have either an AB or BS degree in chemistry, essentially equivalent to those awarded at UMC, with a B average or a score in the 70 percentile of the GRE. Any prerequisite course requirements for a BS as certified by the American Chemical Society which have

not been met previously must be taken at UMC.

All new graduate students in chemistry are required to take departmental orientation examinations shortly before registration. These examinations will serve as possible qualifying examinations for the MS degree. A student who performs well on any of the four divisional examinations as determined by the Departmental Graduate Program Committee will be considered to have qualified in that division and will not be required to take the core course(s) for that division.

A one year core program for all graduate students is required subject to the exceptions stated above. Completion of the core courses with a B average will satisfy the qualifying examination requirement for the MS degree. Qualification for the PhD candidacy requires, in addition, satisfactory performance on written examinations in each of four areas of chemistry.

The master's degree program requires a minimum of 30 hours of graduate-level course work, including 8-12 credit hours of research, satisfactory completion of the qualifying examinations and an acceptable thesis. There is no language requirement. A final oral examination covering both the thesis and course work is given before the degree is awarded.

To become a candidate for the PhD degree, a student must be accepted by the department, and the course work and research program must be approved by an advisory committee. Departmental acceptance is based on the applicant's previous course records and performance on qualifying examinations.

The PhD comprehensive exam consists of written tests followed by an oral examination which emphasizes the major field but also includes related branches of chemistry.

The candidate must submit a dissertation describing the results of successful and original research in one of the branches of chemistry. After the dissertation has been accepted, there is a final oral examination, primarily in the field of the candidate's research.

CHILD AND FAMILY DEVELOPMENT College of Home Economics

FACULTY

Marilyn Coleman, chairperson, associate professor, EdD, University of Missouri-Columbia
Kathy Thornburg, professor, PhD, University of Missouri-Columbia
David Imig, associate professor, PhD, Michigan State University
Jean Ispa, associate professor, PhD, Cornell University
George Wise, associate professor, PhD, University of Connecticut
Mary Gray, assistant professor, PhD, Michigan State University
Marion Typpo, assistant professor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED MA and MS in child and family development

PhD in home economics with an emphasis area in child and family development

Students selecting the master of arts (applied emphasis) and the master of science (research emphasis) degrees may specialize in family studies, medical child development, early childhood, life span human development, or administration of human services programs. Programs are structured to provide students with an integration of empirical research training, practicum experience and broad theoretical interpretation.

The MA and MS degrees prepare students for positions in junior college or college teaching, in adult education programs (e.g. extension), in the administration of human service programs, or leadership in both public and private institutions. The MS degree also provides training toward the PhD degree. The PhD program can lead to research, to college or university teaching, or to leadership positions in both public and private institutions.

See *Home Economics* in this section for general information. Additional information may be obtained from the chairperson, Department of Child and Family Development, 31 Stanley Hall.

CIVIL ENGINEERING College of Engineering

FACULTY

John T. O'Connor, professor, chairperson, EngD, Johns Hopkins University
Karl H. Evans, professor, associate chairperson, MSCE, University of Illinois
Harold J. Salane, professor, director of graduate studies, PhD, University of Texas
James W. Baldwin Jr., professor, PhD, University of Illinois
Shankha Banerji, professor, PhD, University of Illinois
Neal B. H. Benjamin, professor, PhD, Stanford University
Richard T. Douty, professor, PhD, Cornell University
Charles W. Lenau, professor, PhD, Stanford University
Henry Liu, professor, PhD, Colorado State University
Jay B. McGarragh, professor, PhD, Purdue University
David L. Guell, associate professor, PhD, Northwestern University
Louis Hemphill, associate professor, PhD, University of Missouri-Columbia
George H. Stickney, associate professor, PhD, University of Michigan
Vellore S. Gopalaratnam, assistant professor, PhD, Northwestern University
Mark Virkler, assistant professor, PhD, University of Virginia

GRADUATE DEGREES OFFERED

MS in civil engineering
MS in sanitary engineering
PhD in civil engineering

The Department of Civil Engineering offers the master of science degree in civil engineering, the master of science degree in sanitary engineering and the doctor of philosophy degree in civil engineering. Information on engineering licensure is detailed in the general Graduate School section under Professional Engineering Registration.

Specific programs of study have been developed in six areas:

Structural engineering - structural mechanics, analysis and design, soil mechanics and foundations, emphasis on advanced aspects of structural behavior.

Sanitary and environmental engineering - principal emphasis on water pollution control, water purification, waste water treatment and the disposal of residues from these processes; concentrates on the application of chemical and microbiological principles to design for water supply and pollution control.

Construction Planning and Management - coursework integrating a combination of business administration, cost accounting and economics tailored to the needs of the construction engineer or manager.

Transportation and urban systems engineering - emphasis on course work ranging from highway and pavement design to land use planning and the development of advanced transportation systems for urban areas.

Hydraulic engineering and water resources planning and management - combines classical hydraulic design with systems analysis and optimization techniques for enhanced planning of large scale water resources systems. Emphasis is given to the social, political and regional economic effects of large-scale water projects.

Municipal and public works engineering - designed for engineers who plan to work in urban administration and management; broad in scope and oriented towards legal and political administration, cost management regulation and enforcement for environmental control.

The department has well-equipped laboratories for experimental research in structures, sanitary (environmental) engineering, soil mechanics and fluid mechanics. The structural laboratory contains closed-loop-servo-controlled hydraulic loading apparatus and automatic data acquisition equipment. The environmental engineering laboratories are equipped with analytical equipment for the complete chemical and biological analysis of water and wastewater. A separate sanitary engineering laboratory building, located adjacent to the nuclear reactor facility, is used for pilot plant testing and larger scale studies related to water purification, waste water treatment and pollution control. A laboratory for research on advanced water treatment processes is under development.

In addition to the fellowships and traineeships supported by NSF, EPA and other governmental agencies, approximately 10 graduate research and teaching assistantships are available each year. Half-time appointments pay \$7,200 and permit the recipient to take 12 credit hours per semester. Information regarding availability of financial support and further details about specific programs may be obtained by writing to the director of graduate studies, Department of Civil Engineer-

ing, 1043 Engineering Building, UMC, Columbia, Mo. 65211.

MASTER'S DEGREE-THESIS AND NON-THESIS OPTION

An applicant with a BS degree in engineering from an ABET accredited program and an undergraduate GPA of at least 3.0 or the equivalent ($A=4.0$) during the last two years of undergraduate work may be admitted to the program leading to the MS in civil engineering. Candidates for the MS in sanitary engineering can have a BS degree in the physical or biological sciences; non-engineers may be required to make up certain program deficiencies.

The GRE must be taken prior to admission or during the first semester of enrollment.

Each master's program requires a minimum of 30 credit hours; a minimum of 15 hours of this credit must be in courses numbered 400 or higher. At least one week prior to the final oral 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. The final oral examination is required of all master's candidates.

DOCTORAL DEGREE

Formal acceptance to candidacy for the PhD degree is based on a written and oral qualifying examination, administered by faculty members in the student's area of concentration, during the first semester 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 committee may conduct an oral qualifying examination concurrently with the final examination for the master's degree.

PhD programs are committee administered and tailored to fit the needs of each individual student. Specific requirements are held to a minimum of two years of course work and one year of research beyond the bachelor's degree. One year of credit is given for the MS degree and the second year comprises approximately 30 credit hours of additional course work. The candidate must pass a comprehensive examination, and submit and defend a dissertation at a final oral examination.

CLASSICAL STUDIES College of Arts and Sciences

FACULTY

Charles Saylor, professor, chairperson, PhD, University of California

Barbara P. Wallach, assistant professor, director of graduate studies, PhD, University of Illinois

Eugene N. Lane, professor, PhD, Yale University

Theodore A. Tarkow, professor, PhD, University of Michigan

John C. Thibault, professor, PhD, University of Illinois
Victor A. Estevez, associate professor, PhD, University of Wisconsin

Edward A. Schmoll, visiting assistant professor, PhD, University of Iowa

GRADUATE DEGREES OFFERED

MA in classical languages

INTERDISCIPLINARY AREA PROGRAM

PhD in classics and classical archaeology

The Department of Classical Studies offers graduate work leading to the master of arts degree in classical languages in Greek or in Latin. With the Department of Art History and Archaeology the department offers the doctor of philosophy degree in classics and classical archaeology. The MA in classical languages normally is taken by students who intend to pursue the PhD degree.

Graduate programs in classical studies are designed to prepare students for professional careers as teachers and scholars of classical literature and ancient civilization. In addition to acquiring expertise in the traditional classical disciplines, students are encouraged to acquire some familiarity with areas such as later literatures and cultures on which the classical tradition has exercised a decided effect.

Since UMC is a contributing member of the American Academy in Rome and the American School of Classical Studies in Athens, their facilities are available to graduate students from Missouri. It is often feasible to study in Athens or Rome after completing the work for 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 literature as well as in the various 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.

MASTER'S DEGREE

The requirements for admission to the MA program are an AB degree from an accredited college or university, a reading knowledge of Greek and/or Latin, and a GPA of at least 3.0 ($A=4.0$) or the equivalent during the last two years of undergraduate work.

The minimum course of study requirements are 30 hours of course work; at least 15 hours in Greek, Latin, classics and related fields must be at the 400 level and at least 6 hours should be in courses in other departments. At least 18 hours must be in Latin and classics, Greek and classics or Latin, Greek and classics. A student may minor in a related field or may spread related work over several areas. A minor shall consist of no less than 10 and no more than 12 hours. Classical Studies 409, Introduction to Graduate Study in Classics, is required of all students in their first year of graduate study.

While there is no foreign language requirement for the MA degree, students

are strongly advised to pass a reading comprehension examination in one foreign language during their first year of graduate work.

During the first month of graduate study the student and advisor should plan a reading list, consisting of original and translated works which pertain to the student's major interests. An examination on the reading list is part of the final examination for the degree.

An hour-long final oral examination is given by a faculty board. If a thesis has been submitted, this examination will include defense of the thesis and general questions within fields related to the thesis. The examination cannot be administered during the summer session.

DOCTORAL DEGREE (AREA OF CLASSICS & CLASSICAL ARCHAEOLOGY)

The minimum requirements for admission to the PhD program include an AB degree from an accredited college or university, a reading knowledge of Greek and/or Latin, and sufficient reading knowledge of German and/or French (or, in justifiable instances, Italian).

The minimum course of study requirements for the degree are 36-42 hours in classical studies at the 300 and 400 levels, at least 8 hours of dissertation credit not included in formal course work, and a passing grade of A or B in at least 24 hours of graduate-level courses outside the major department (at least 15 must be in one department, field, area or program).

The precise details of the student's program are determined by the student and advisor. Courses in classical archaeology must be taken sometime during the student's program.

Though some command of German and/or French (or Italian) is necessary from the outset, students are required to have demonstrated proficiency in one of the languages by registration for their second year of graduate study and in the second language by final registration for their third year.

By the beginning of the second year, the student should ask the advisor to officially recommend an advisory committee of five persons to administer the two-part departmental qualifying examination. The written examination consists of translations of passages from Greek and Latin literature, based on a reading list composed by the student and advisor. The oral examination covers the major authors and works of the classical periods of Greek and Latin literature.

After the successful completion of residence, language and course requirements, the student must pass the comprehensive examinations consisting of five examinations in the following fields: (1) Greek literature, (2) special author (Greek), (3) Latin literature, (4) special author (Latin) and (5) minor field. A special topic may be substituted for one of the special authors.

The student then should complete a dissertation and secure approval according to regulations, and pass a final oral examination on the thesis of the dissertation and on related subjects.

CLOTHING AND TEXTILES College of Home Economics

FACULTY

Kitty Dickerson, chairperson, associate professor, PhD, St. Louis University

Betty Feather, associate professor, PhD, University of Missouri-Columbia

Josephine M. Holik, associate professor, MA, Virginia Polytechnic Institute

GRADUATE DEGREES OFFERED

MA and MS in clothing and textiles

PhD in home economics with emphasis area in clothing and textiles

Students selecting the master of science degree may specialize in marketing and consumer oriented areas related to textiles and clothing or the social-psychological analyses of costume and dress. Those selecting the master of arts degree may specialize in the history of dress and costume or costume design. The PhD degree student may specialize in marketing and consumer oriented areas related to textiles and clothing, the social-psychological analyses of costume and dress, or historical areas of dress and costume.

The MA and MS degrees prepare students for positions in community college or college teaching, in extension, in business or in museum work. The MS degree also provides training toward the PhD degree. The PhD program can lead to research, to college or university teaching or to leadership positions in both public and private institutions.

See *Home Economics* in this section for general information. Additional information may be obtained from the chairperson, Department of Clothing and Textiles, 137 Stanley.

COMMUNICATIVE DISORDERS

School of Health Related Professions

FACULTY

James D. Amerman, professor, program director, PhD, University of Illinois

Donald G. Williamson, associate professor, director of graduate studies, PhD, Michigan State University

Richard D. Jacques, assistant professor, PhD, Bowling Green State University

Martha M. Parnell, assistant professor, PhD, University of Missouri-Columbia

Linda S. Day, clinic director, MA, University of Missouri-Columbia

Arlene Johnston, clinical instructor, MEd, University of Michigan

Shirley S. Patterson, clinical instructor, MA, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MHS in communicative disorders with an emphasis area in speech-language pathology or audiology

COOPERATIVE DEGREE

PhD in speech and dramatic art with an emphasis area in speech pathology-audiology

The Communicative Disorders Program offers graduate work leading to the degrees of master of health science and doctor of philosophy. The PhD is currently offered through the Department of Speech and Dramatic Art. The graduate program permits specialization for professional academic and clinical training at the master's level and provides for advanced study and research at the doctor's level that leads to college teaching and research or to direction of service, training or research programs.

The program utilizes many clinical and scientific resources and cooperative facilities, both on and off campus, in formulating individual student programs which best fulfill academic and clinical training requirements. Included in the list of cooperative facilities are the UMC Health Sciences Center, Rusk Rehabilitation Center, Truman Veterans Hospital, Audrain County Medical Center, Columbia Public Schools and local and regional preschools. Additionally, the program operates the University of Missouri-Columbia Speech and Hearing Clinic which is a complete diagnostic and treatment center serving communicatively handicapped individuals from the campus and community. The program also maintains its own laboratory with sophisticated equipment which is used for the objective clinical evaluations of communication disorders and research in the areas of normal and abnormal speech, language and hearing.

The faculty and students at all levels of instruction in the program enjoy the advantage of a large multipurpose university which offers an excellent academic environment for the areas of speech-language pathology and audiology. Among these are excellent library and computer facilities and a comprehensive medical school facility.

The program maintains close affiliation with the American Speech-Language-Hearing Association, with its master's degree in speech-language pathology enjoying continuous accreditation since 1965. In addition, the program sponsors an active local chapter of the National Student Speech-Language-Hearing Association.

MASTER'S DEGREE

A selection committee determines admission to the program. The applicant must submit official undergraduate transcripts, Graduate Record Examination scores, a letter of intent, three letters of recommendation, and meet the minimum 3.0 GPA (A=4.0) for the last 60 hours of undergraduate and graduate work completed. If the candidate is currently pursuing an undergraduate major in speech pathology or audiology they must provide one letter of recommendation

from a certified clinical supervisor associated with their bachelor's program. Personal interviews will be scheduled if suitable arrangements can be made between the selection committee and candidate.

Students admitted to the master of health science program must complete, at the University of Missouri-Columbia or elsewhere, the requirements for an undergraduate major in speech pathology or audiology. In addition, master's degree candidates are required to complete a minimum of 36 graduate-level courses with a B (3.0) or higher. No fewer than 27 hours must be earned in 400 level graduate courses offered by the communicative disorders program. A maximum of 6 hours in clinical practicum courses will be allowed as part of the final 36 hour requirement.

Students must satisfactorily pass a written comprehensive examination during the final semester of coursework toward the MHS degree. Students may take the American Speech-Language-Hearing Association national certification examination to satisfy this requirement.

Individual programs in a major specialization area (speech-language pathology or audiology) are determined in consultation with a graduate advisor. Student programs are monitored carefully so that program requirements and the requirements for the Certificate of Clinical Competence in Speech-Language Pathology or Audiology issued by the American Speech-Language-Hearing Association are satisfied.

DOCTORAL DEGREE

The program in speech pathology/audiology currently offers the PhD through the Department of Speech and Dramatic Art. For more specific information concerning the PhD program contact Dr. James D. Amerman, program director.

For additional information concerning the degree programs, contact the director of graduate studies in communicative disorders, 125 Parker Hall, UMC, Columbia, Mo. 65211.

COMMUNITY DEVELOPMENT College of Public and Community Service

FACULTY

Donald W. Littrell, associate professor, chairperson, MS, University of Missouri-Columbia
James B. Cook, assistant professor, director of graduate studies, PhD, Walden University
Alvin S. Lackey, professor, PhD, Cornell University
Lee J. Cary, professor, PhD, University of Syracuse
Bryan Phifer, professor, PhD, University of Chicago
William E. Robertson, professor, PhD, Wisconsin University
Hugh Denney, professor emeritus, MA, University of Missouri-Columbia

John A. Croll, associate professor, MS, University of Missouri-Columbia

E. Frederick List, associate professor, MAEd, Washington University (St. Louis)

George F. Nickolaus, JD, associate professor, dean, College of Public & Community Services, University of Missouri-Columbia

Jack D. Timmons, associate professor, PhD, University of Nebraska

Boyd Faulkner, associate professor emeritus, MS, University of Nebraska

GRADUATE DEGREES OFFERED

MS in community development

MS in community development with emphasis area in youth agency administration

The Department of Community Development offers a program of graduate work leading to a master of science in community development - one of only four such programs offered in the United States. UMC's program prepares students for professional practice. Specific courses and field experience help prepare students for urban careers, rural and regional positions and international work. Within the elective component of the master's program, students may take an area of specialization in planning, public administration, gerontology, youth work, urban affairs, international development, or research and evaluation.

An applicant with an overall undergraduate GPA of at least 2.5 (A = 4.0) may be admitted to the program. Students accepted in the program must pass a qualifying examination at the end of their first semester to be admitted to candidacy for the master of science degree.

A total of 39 credit hours is required for a master of science in community development. The core curriculum consist of 27 credit hours in the Department of Community Development including 6 hours of field experience. The remaining 12 hours consist of elective courses selected by the student and advisor. Electives may be selected from non-core courses in the Department of Community Development and appropriate courses offered by other departments. At the student's option, the elective courses may be concentrated in a single field of study to constitute an area of specialization.

Students are required to take a qualifying examination near the end of their first semester and a final examination near the end of their master's program.

The department also offers an 18 hour diploma program.

The department is responsible for inservice training and supports the Community Development field staff employed by the University of Missouri Extension Division. In addition to other academic responsibilities members of the faculty hold extension appointments.

Through extension activities, the faculty and students maintain contact and involvement with communities in Missouri and the practice of community development.

COMPUTER SCIENCE College of Arts and Sciences

FACULTY

Peter A. Ng, professor, chairperson, PhD, University of Texas-Austin

Paul K. Blackwell, professor, associate chairperson, PhD, Syracuse University

Donald R. Shurtleff, professor, PhD, Worcester Polytechnic Institute

Sushil Jajodia, associate professor, PhD, University of Oregon

Gordon K. Springer, associate professor, assistant director for Systems, Computer Network, PhD, Pennsylvania State University

Fred N. Springsteel, associate professor, PhD, University of Washington-Seattle

Larry R. Sanders, assistant professor, PhD, University of Illinois-Urbana/Champaign

GRADUATE DEGREES OFFERED

MS in computer science

The Department of Computer Science offers a course of study leading to the master of science in computer science. The program is sufficiently flexible to enable students to prepare for careers as computer professionals or to prepare for admission to doctoral programs. Located in the Mathematical Science Building the department has local terminal access to the University's computer network which operates an Amdahl 470V/8 - Amdahl 470V/7, IBM 3081-D complex running MVS/SP release 3 and VM/SP release 3. Also in the same location is the Mathematical Sciences Library with over 17,000 volumes and 350 journal subscriptions on computer science, mathematics and statistics.

MASTER'S DEGREE

To qualify for admission an applicant must have (1) three semesters of calculus, (2) at least one course in mathematics beyond the calculus sequence, (3) Math 226, Discrete Mathematical Structures, or an equivalent, (4) proficiency in PL/1 and one other programming language, (5) Computer Science 210, Introduction to System Concepts, or equivalent, (6) a grade point average of 3.0 (A = 4.0) for all undergraduate courses and (7) acceptable scores on the GRE the advanced test in computer science is not required.

Requirements for the MS degree include satisfactory completion of 30 credit hours of course work covering programming languages and language processors, operating systems and systems programming, data structures and programming techniques, the theory of computation, and the design and construction of computers. The program of study, emphasizing the interrelations of the practical and the theoretical aspects of computer science, culminates in a master's project which is carried out under the supervision of a faculty advisor.

CURRICULUM AND INSTRUCTION College of Education

FACULTY

W. Wayne Dumas, professor, chairperson, EdD, University of Arkansas

Larry A. Kantner, professor, director of graduate studies, EdD, Pennsylvania State University
James L. Craigmile, professor, EdD, University of Nebraska
Arni T. Dunathan, professor, EdD, University of Utah
Carl C. Fehrle, professor, PhD, University of Iowa
Thomas L. Good, professor, PhD, University of Indiana
Douglas A. Grouws, professor, PhD, University of Wisconsin-Madison
Veralee B. Hardin, professor, EdD, University of Missouri-Columbia
Peter Hasselriis, professor, PhD, University of Syracuse
James A. Middleton, professor, DMEd, University of Oklahoma
Ben F. Nelms, professor, PhD, University of Iowa
Neila T. Pettit, professor, EdD, University of Missouri-Columbia
Robert F. Reys, professor, EdD, University of Missouri-Columbia
Richard D. Robinson, professor, EdD, University of Georgia
Cary T. Southall, professor, EdD, University of Florida
A. W. Sturges, professor, PhD, University of Iowa
Dorothy Watson, professor, PhD, Wayne State University
Bob G. Woods, professor, PhD, University of Iowa
Betty M. Burchett, associate professor, EdD, University of Indiana
Stevie Hoffman, associate professor, PhD, University of Florida
John Benjamin Leake, associate professor, EdD, Oklahoma State University
Linnea Lilja, associate professor, PhD, University of Minnesota
John A. Voth, associate professor, PhD, University of Minnesota
Russell Cassity, assistant professor, EdD, University of Indiana
Joseph Kurth, assistant professor, PhD, University of Missouri-Columbia
M. Marjorie Roberts, assistant professor, EdD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MA or MEd in curriculum and instruction with the following emphasis areas: art education, early childhood education, elementary education, educational media, English education, foreign language education, mathematics education, music education, reading education, science education, secondary education or social studies education.

EdSp, EdD or PhD in curriculum and instruction with the following emphasis areas: art education, curriculum and instruction, early childhood education, educational media, elementary education, English education, foreign language education, mathematics education, music education, reading education, science education, secondary education, or social studies education.

Graduate study in curriculum and instruction prepares teachers, curriculum leaders and teacher educators for professional excellence. With the rapid changes in education-especially new developments in instructional materials and techniques, curriculum construction and classroom organization - teachers who have completed their certification, even recently, feel a need to update, refine and extend their knowledge and skills. Further, many educators enter new roles as subject matter specialists, media specialists, curriculum coordinators, supervisors of instruction, department chairs, leaders of inservice education or teacher educators. Graduate programs in curricu-

lum and instruction are designed to prepare the professionals for these new roles.

See Education in this section for general information. Additional information may be obtained for the director of graduate studies, Department of Curriculum and Instruction, 209 Education Building, UMC, Columbia, Mo. 65211.

DAIRY SCIENCE College of Agriculture

FACULTY

Rex E. Ricketts, interim chairperson, director of graduate studies, PhD, University of Missouri-Columbia
Fredric A. Martz, professor, PhD, Purdue University
Ralph R. Anderson, professor, PhD, University of Missouri-Columbia
H. Allen Garverick, professor, PhD, Purdue University
Harold D. Johnson, professor, PhD, University of Missouri-Columbia
Charles P. Merilan, professor, PhD, University of Missouri-Columbia
John D. Sikes, professor, PhD, University of Missouri-Columbia
Ronald L. Belyea, associate professor, PhD, Cornell University
Barry J. Stevens, associate professor, PhD, Oklahoma State
Theodore A. Mollett, assistant professor, PhD, Purdue University

GRADUATE DEGREES OFFERED

MS in dairy science

PhD in dairy science

INTERDISCIPLINARY AREA PROGRAM

MS nutrition area

PhD in nutrition area

PhD in physiology area

The Department of Dairy Science offers graduate study leading to the degrees of master of science and doctor of philosophy. Additionally, faculty members participate in the area program of nutrition which offers the MS and PhD degree and the area program of physiology which offers the PhD degree. Those programs are described elsewhere in this catalog.

Graduate programs in dairy science prepare students for advanced professional scientific careers in the fields of dairy production, physiology, endocrinology, nutrition and reproductive physiology. Students trained in dairy science enter into agriculture positions, as well as research positions in the fields of medical, space and biological sciences.

The department cooperates closely with all phases of the dairy industry, both state and national. The University farms and herds offer many opportunities to students interested in relating their studies to problems of the industry. Special facilities for research in dairy science include (1) environmental physiology-climatic laboratory facilities for both large and small laboratory animals., (2) endocrine and nutrition facilities for digestion and lactation physiology studies on cattle; (3) special laboratories for bioassay and tracer endocrine and metabolism research; (4) special equipment for metabolism studies on a broad spectrum of species; (5) cooperative use of the Low Level Radiation Laboratory, Nuclear

Reactor, Sinclair Comparative Medicine Research Farm, Research Center facilities and the agricultural engineering department thermo-electric partition calorimeter; (6) the Computer Network, with consultation service for statistical analysis of research data; and (7) the Agricultural Experiment Station Chemical and Spectrographic Laboratories.

Fellowships, scholarships and teaching and research assistantships are available to qualified dairy science graduate students. Applications should be submitted by March 1 each year. Additional information may be obtained from the director of graduate studies, Department of Dairy Science, College of Agriculture, 104 Eckles Hall, Columbia, Mo. 65211.

MASTER'S DEGREE

Whether the BS in agriculture or some other baccalaureate degree is held, the candidate must have included in undergraduate work a minimum of 25 credit hours in the following specified subjects or their equivalents: chemistry, physics, zoology, bacteriology, economics, mathematics and physiology. In addition, a student should show acceptable performance on the GRE, and a 3.0 or higher overall GPA (A=4.0) is recommended, consideration given to other criteria.

The degree requirements are those of the Graduate School with at least 16 of the 30-hour minimum requirement to be in 400-level courses. There is no language requirement. A candidate is required to submit a thesis.

DOCTORAL DEGREE

To become a doctor of philosophy degree candidate, a student must pass a qualifying examination administered by the Department of Dairy Science and the advisory committee, and/or qualify for the degree in the areas of physiology or nutrition.

The program for the PhD degree requires a minimum of two years beyond the master's degree or three years beyond the BS degree. Normally, candidates are required to (1) complete an individually arranged program of study; (2) pass an oral and written comprehensive examination; (3) demonstrate proficiency by examination in one foreign language or in a collateral field; (4) demonstrate ability to do original research and suitably prepare material for publication in a scientific journal; and (5) pass a final oral examination.

Supporting fields for dairy science are engineering, endocrinology, neurophysiology, behavioral sciences, biochemistry, chemistry, environmental physiology, metabolism, statistics, biology, nutrition, and microbiology.

ECONOMICS College of Arts and Sciences

FACULTY

W. Whitney Hicks, professor, chairperson, PhD, Stanford University
David W. Stevens, professor, director of graduate studies, PhD, University of Colorado

John P. Doll, professor, PhD, director of graduate studies, Iowa State University
Stanley R. Johnson, adjunct professor, PhD, Texas A & M University
John M. Kuhlman, professor, PhD, University of Wisconsin
Maw Lin Lee, professor, PhD, University of Wisconsin
Wayne A. Leeman, professor, PhD, University of Wisconsin
David J. Loschky, professor, PhD, Harvard University
Carmen F. Menezes, professor, PhD, Northwestern University
Paul E. Smith, professor, PhD, University of Michigan
Richard L. Wallace, professor, PhD, Vanderbilt University
Floyd K. Harmston, professor emeritus, PhD, University of Missouri-Columbia
Stephen G. Buckles, associate professor, PhD, Vanderbilt University
Charles G. Geiss, associate professor, PhD, North Carolina University
Walter L. Johnson, associate professor, PhD, Duke University
Richard J. McHugh, associate professor, PhD, Syracuse University
Douglas Pearce, associate professor, PhD, University of Wisconsin
Ronald A. Ratti, associate professor, PhD, Southern Methodist University
Donald J. Schilling, associate professor, PhD, University of North Carolina
Robert J. Strom, associate professor, PhD, University of Cincinnati
Elizabeth A. Dickhaus, assistant professor, PhD, University of Missouri-Columbia
Timothy J. Maloney, assistant professor, PhD, University of Wisconsin-Madison
Neil Raymon, assistant professor, PhD, University of Colorado-Boulder
James T. Wilkinson, assistant professor, PhD, Vanderbilt University

GRADUATE DEGREES OFFERED

MA in economics

MST in economics

PhD in economics

The Department of Economics offers graduate work leading to the master of arts, master of science for teachers, and the doctor of philosophy. The program prepares students for careers in government and business, colleges and universities, and research institutions. The program provides a core of knowledge in economic analysis and offers the student a choice from among several areas of specialization. The student develops skills in the interpretation of data and in the formulation and appraisal of public policy.

Areas of specialization are: economic theory, econometrics, economic development, economic education, industrial organization, international economics, labor economics, monetary theory and policy, public finance and income stabilization, utilities and regulated industries, urban/regional economics and health economics.

Public Finance and Income Stabilization: Subject matter in this area deals with techniques for evaluating the uses of fiscal and monetary tools for the attainment of employment, price level and growth objectives. Problems investigated as a part of studies in public finance and income stabilization are the determination of the amounts and types of public goods to be provided, the efficiency of government spending and the impact of

taxation upon resource allocation and income distribution.

Industrial Organization: Industrial organization applies microeconomic theory to evaluate the structure, conduct and performance of different markets. Course work in this area emphasizes the determinants of, and links between, these market dimensions. Various relationships pertaining to the structure-conduct-performance paradigm, such as that between market concentration and profitability, are examined.

Economic Education: This area is designed for students who have a strong interest in the teaching of economics. Students who choose this area generally select an outside field in learning theory or another area offered by the College of Education. Research in economic education has focused on the effectiveness and efficiency of alternative teaching and learning methods.

Labor Economics: Study in this area emphasizes analysis of the relevance of economic concepts to an understanding of such labor market phenomena as wage structure discrimination, human capital formation, underutilization of human resources and governmental intervention strategies.

Utilities and Regulated Industries: This area involves the study of the impact of government intervention in the market system through regulation of prices and the quality of service. Students in this area have the opportunity to supplement their course work through close contact with the Missouri Public Service Commission and public utilities in Missouri. This contact is facilitated through an active research program in the department and a summer internship program with the Commission and the utilities.

Monetary Economics: Studies in this area concentrate on the role of various institutional arrangements and the operations of credit markets, the consequences of specific changes in banking structure and the welfare aspects of the structural policies.

Applicants for graduate study in economics should write the director of graduate studies (economics), 217 Middlebush Hall, Columbia, Mo. 65211 for specific information about the graduate program and application forms for teaching and research assistantships. Admission forms for Graduate School may be obtained directly from the campus admissions office or through the department. March 1 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. Admission may be granted at any time to qualified students.

MASTER'S DEGREE

The department encourages application from anyone who is interested in graduate study in economics. A bachelor's degree in any field, a GPA of 3.0 (A =

4.0) in the last two years, and an adequate GRE score comprise minimum requirements for admission. Individuals accepted at the minimal requirements level will be assigned special support coursework, some or all of which can be counted toward the MA degree. The verbal and quantitative sections of the Graduate Record Examination are required for admission. TOEFL scores are also required of those applicants whose native language is not English.

To fulfill requirements for the MA degree, a candidate must complete a 30-hour approved program of study with a minimum of 15 hours in 400-level courses. The program must include Economics 451 (microeconomics) or equivalent, Economics 453 (macroeconomics), Economics 472 (econometric methods). The program also requires a minimum of 18 hours in economics and may include 6 to 12 hours in related social sciences, business administration, mathematics, statistics or other supportive areas outside of economics.

The MA student must elect one of the following:

(1) The Thesis Option. The student must write a satisfactory thesis for which a maximum of 6 semester credit hours including 3 credit hours in Economics 490 may be earned. This option therefore, requires a minimum of 24 hours of other formal coursework. The student must defend the thesis either at a seminar open to all faculty and students or before an MA examining committee.,

(2) The Non-Thesis Option. The student must write a research paper in lieu of a thesis for which a maximum of 3 semester credit hours in Economics 413 may be earned. This option therefore, requires a minimum of 27 hours of other formal coursework. The paper may be written in conjunction with a graduate course in which a term paper is required. It will be more substantial than the usual term paper and may satisfy both the MA requirement and the course requirement. The student may defend the paper in lieu of thesis at a seminar open to all faculty and students. If a public defense is not held, the student must pass an oral examination which will cover three fields chosen from areas commonly offered in the department. It will test for breadth and depth of understanding of material covered in the first 400-level course taught in each of the three fields chosen.

As a final option, the student may elect to take the written PhD qualifying examinations.

DOCTORAL DEGREE

The PhD is granted only to those who have gained a comprehensive knowledge and understanding of theoretical and applied economics. Thus only those who show definite promise of superior attainment are admitted to candidacy.

Ordinarily, for admission to the PhD

program, a student must have the MA, or be able to meet qualifications for admission similar to those for a MA program. Two semesters after beginning course work toward PhD, the student must qualify for the doctoral program. This is achieved by passing the qualifying examination in economic theory based on the content of Economics 451 and Economics 453.

The PhD program in economics is designed to offer maximum flexibility. Students may choose a sequence of formal course work and independent readings uniquely tailored to their individual interests and intended careers. Ordinarily, the program includes:

- (1) Economic Theory (12 hours)
 - 451 Advanced Price Theory
 - 452 Seminar in Microeconomics
 - 453 Advanced Income Analysis
 - 454 Seminar in Macroeconomics12 hours
- (2) First Area in Economics (areas listed below).....6 hours
- (3) Second Area in Economics6 hours
- (4) Third Area in Economics6 hours
- (5) Additional Credits in dissertation area (any of the above three areas)3-6 hours
- (6) Outside Field (12 hours; such as mathematics, statistics, philosophy, political science, law, history, psychology, sociology)12 hours
- (7) Quantitative Skills (equivalent or more advanced courses are accepted)
 - 370 Introduction to Quantitative Economics
 - 472 Introduction to Econometrics6 hours
- (8) Electives3-0 hours
- Subtotal (Sum of 1 - 8).....54 hours
- (9) Independent Readings in Preparation for the PhD Comprehensive Examination (Econ 480).....6 hours
- (10) Dissertation Research (Econ 490).....12 hours
- Total (sum of 1 to 10)72 hours

Available areas of specialization are:

- Economic Demography
- Economic Theory
- Econometrics L
- Economic Development
- Economic Education
- Economic History
- Health Economics
- Industrial Organization
- International Economics
- Labor Economics
- Monetary Theory and Policy
- Public Finance and Income Stabilization

NOTES: 1. Econ 370 and Econ 472 are not acceptable in the first, second, and third areas in economics (2,3, and 4 above).

- 2. con 400 is acceptable under Additional Credits and Electives (5 and 8) if, at the time of the comprehensive oral examination, the student is prepared to offer (and defend before the Comprehensive Examining Committee) a complete and documented research proposal leading to the PhD dissertation. It is the responsibility of the chairperson of the student's Comprehensive Examining Committee to insure that the conditions of this option are met.

Coursework Hours: The 54 semester credit hours, satisfying requirements 1 - 8, include courses taken toward the master of arts at UMC or, under most circumstances for students entering the program with a master's degree, courses taken elsewhere at accredited colleges and universities. The student electing to commence dissertation research early in his/her career will be permitted up to 9 hours of Econ 400 in the 54 semester credit hours mentioned above. (see Note 2)

Micro and Macro Courses Sequence: A student who starts work toward the PhD with only a bachelor's degree is required to enroll in Economics 451 and Economics 453 during his/her first two semesters in the program. A student with a master's degree, who has taken courses taught at an equivalent level of difficulty, may enroll as a hearer after consultation with his/her advisor and with the permission of the instructors of the courses.

In very unusual and hopefully infrequent circumstances, an entering student may not have the appropriate academic background for Economics 451 and/or Economics 453. In such cases, the student will enroll Economics 351 and/or Economics 353 the first semesters and may therefore delay the completion of 451 and 453 beyond the first two semesters. Delay of completion of 451 and 453 past the third semester of consecutive enrollment is unnecessary and erodes the basis of the qualification procedure described below.

Qualifying for the PhD Program: The purpose of the qualifying procedure is to assess the general background of the new student and his/her prospects for success in fulfilling the requirements for the PhD degree. Students who have not completed 451 and 453 are regarded as new students. It is essential that the qualifications of the student be determined as soon as possible and not later than the sixth week of the student's third semester of study for the doctorate.

The comprehensive examination consists of three parts:

- 1. written examinations in the student's three major areas of specialization in economics

- 2. an oral examination
- 3. the presentation and defense of a complete and fully documented research proposal designed to lead to the PhD dissertation.

The written examinations will be four hours in length and will be administered in three consecutive weeks at times set by the director of graduate studies. The written examinations shall stand in reasonable relation to the nature and objectives of the student's program of study but may cover more than the content of courses taken.

The oral examination shall be taken within two weeks after the completion of the last scheduled written examination. If the student presents a dissertation research proposal, an explanation and defense of this proposal shall constitute a legitimate portion of the comprehensive oral examination, and the student's performance in the oral shall be based in part upon the economic validity, originality and understanding of the research proposed.

If the student has not prepared a dissertation research proposal but wishes to proceed with the written and oral portions of the examination, he/she may do so. In such cases, if performance on the written and comprehensive oral parts of the examination is satisfactory, students shall be deemed to have neither passed nor failed and the comprehensive examination will be placed in an adjourned status. The student must then prepare and defend a dissertation research proposal before the Comprehensive Examining Committee before the end of the following regular semester (not including the summer semester).

For purposes of this examination, the dissertation research proposal will include a statement of the problem, the hypotheses to be tested, a literature review complete with references, a discussion of the applicable economic models and testing procedures, the method of analysis and probable data sources. A dissertation outline would be highly desirable. Requirements will vary, depending upon the nature of the problem. Exact content of the proposal shall be subject to approval by the student's advisor.

Upon submission and defense of the research proposal, either at the time of the examination or within the one-semester limit, the candidate will be considered to have passed the comprehensive examination if all but one of the Comprehensive Examining Committee record pass votes. If failure is reported, the committee will recommend suggested work or other remedial measures. The candidate may not take a second examination for 12 weeks.

Dissertation and Final Examination: A dissertation must be written on a subject approved by the student's committee as described above. To be acceptable, the dissertation must make a

substantial contribution to knowledge in the area in which it is written. The final examination shall be oral and shall include an evaluation of the dissertation, the student's defense of the dissertation, and the student's comprehension of economics in general.

EDUCATION

College of Education

FACULTY

Bob G. Woods, dean, professor, PhD, University of Iowa

Wilbur R. Miller, professor, associate dean, director of graduate studies, EdD, University of Missouri-Columbia

Charles H. Koelling, professor, associate dean, EdD, University of Missouri-Columbia

Graduate programs in education are administered on a departmental basis with coordination at the divisional level. The departments provide programs which lead to a common set of degrees: master of education, master of arts, educational specialist, doctor of education and doctor of philosophy. General information is contained in this section. Faculty and degrees are listed by department under the individual fields of study. The following departments are in the College of Education: curriculum and instruction, educational administration, educational and counseling psychology, health and physical education, higher and adult education and foundations, practical arts and vocational-technical education, and special education.

ENTRANCE REQUIREMENTS

All graduate students in education are required to take the standardized test or tests (Miller Analogies Test, Terman Concept Mastery, Graduate Record Examination) designated by the department in which they are enrolled. The examination should be taken prior to the initial registration. If this is not possible, it must be taken during the first session of enrollment.

An individual admitted to a program leading to the master of education or master of arts degree must have completed or agree to complete a minimum of 15 semester hours in departmental recommended courses. These 15 semester hours must include courses which will assure that the student (1) is reasonably knowledgeable about the field of education as a societal institution and/or as a scholarly discipline and (2) has mastered the content of the area of specialization to a degree that would permit the enrollment in 400-level courses in the specialty. Specific information regarding the fulfillment of this requirement may be secured from the department or the associate dean of the College of Education. An applicant who may be otherwise qualified, but who has not completely satisfied the prerequisites, may be admitted to a degree program and satisfy the prerequisites prior to submission of an official application for degree. However, the courses taken to remove or correct deficiencies

may not be applied toward any graduate degree.

Prospective graduate students should make application to the Office of Admissions, 130 Jesse Hall, UMC, Columbia, Mo. 65211, at least 60 days prior to the initial enrollment. The student who fails to make application prior to this deadline may be admitted conditionally pending determination of qualifications.

To be accepted for advisement for the MEd or the MA in education, a student must select an advisor in the area of specialization. The applicant also must have acceptable scores on the required examinations. An applicant with an undergraduate GPA of at least 3.0 (A=4.0) or the equivalent during the last two years of undergraduate work may be admitted to the Graduate School on the basis of this record alone. A student with an undergraduate GPA of between 2.2 and 3.0 will be considered for advisement if other background information or circumstances indicates the likelihood of success in the graduate program. For a student with a GPA of between 2.2 and 2.5, the advisor may request a review of the student's credentials, including standardized test scores, by a committee of three appointed by the appropriate departmental director of graduate studies. The ultimate decision regarding admission to candidacy shall be by vote of the committee.

MEd DEGREE

Residence. The equivalent of two 16-week semesters, each devoted to advanced courses of study, is required for the MEd degree. This requirement may be met in part by transfer of a maximum of eight semester hours of credit earned at an institution accredited to offer graduate work or by correspondence offered by the University of Missouri. Such course work must have prior approval of a student's advisor and the dean of the Graduate School. Graduate work from more than two campuses of the University will not be counted toward the MEd degree.

Program of Study. Over and above the prerequisites, a program of study must include a minimum of 32 semester hours of approved graduate credit. A minimum of 16 semester hours must consist of courses numbered 400 or above. The program must include a minimum of 16 semester hours of graduate courses in education. The program may consist entirely of courses in education or may be made up, in part, of courses from other disciplines selected to fit the candidate's professional needs. To remain in good academic standing, the candidate must maintain a cumulative GPA of 3.0 (A=4.0).

A thesis is not required, but the major advisor may require written reports of field work or special investigation.

The department may require a final comprehensive examination or its equivalent. The examination is approximately

four hours in length and is conducted under the direction of the major advisor. The examination encompasses the major areas of emphasis on the student's program of study. A student must be enrolled for at least "examination only" during the semester or session in which the comprehensive examination is taken.

MA DEGREE

Many of the regulations governing the degree of MA are similar to those governing the degree of MEd. However, the MA degree is planned to emphasize research.

Prerequisites and admission requirements are the same as for the master of education. The procedure for filing an application for the degree is also the same, as is the residence requirement. The choice of advisor is the same except that for the MA the candidate may have a major and a minor field with advisors in both.

The program of study for the MA may include major and minor fields and must include a course in educational statistics. The program emphasizes courses dealing with research.

For an MA with a thesis, a course in methods of research and 3-6 semester hours of 490 Research are required. The non-thesis option MA requires departmental acceptance of a completed research project presented in the form of a manuscript prepared in the appropriate format for submission to a professional journal in the candidate's discipline. Three to six semester hours of 400 Problems may be earned for the non-thesis MA degree as given elsewhere in this catalog.

EdSp DEGREE

The educational specialist (EdSp) degree represents a program of organized and approved graduate work consisting of a minimum of 30 semester hours beyond the requirements for the master's degree. It is anticipated that the program will be in the same area of education in which the master's degree was taken. The program is one of specialization and is built on the foundation represented by the master's degree or comparable training.

A candidate for the degree completes an application to be approved by the advisor, the department, the associate dean of the College of Education and the dean of the Graduate School. The program is directed by an advisory committee with the major advisor chairing the committee.

Evidence of proficiency in the areas of educational statistics and research methodology must be provided prior to the candidate's final examination. This evidence will normally be the satisfactory completion of R370, Educational Statistics I, and R409, Overview of Educational Research. If not completed as a part of the master's degree, the program must include a graduate course in the behavioral, social or philosophic foundations of education. The program may consist

entirely of courses in education or may be composed, in part, of courses selected from other disciplines to meet the candidate's professional needs. A minimum of 15 semester hours of the program must consist of courses in education. A minimum of 15 semester hours of the program must be courses numbered 400 or above. A thesis or seminar paper may be required by the advisory committee.

The required 30 semester hour program must be completed within a period of eight years; the work may be taken in summer sessions. No more than 6 semester hours may be accepted in transfer and only from institutions accredited to offer post-master's degrees. Off-campus courses offered through UMC Extension may be included in the EdSp program. Eight semester hours must be completed after the application for degree has been approved.

A candidate may be required to take a qualifying examination, as determined by the advisory committee. If required, the examination must be administered during the initial semester of enrollment and prior to the filing of the Application for Degree.

A final examination is required.

EdD DEGREE

EdD candidates must have attained either the degree of master of arts in education, the degree of master of education or the quantitative and qualitative equivalent of one of these degrees from an accredited college or university. See Doctor of Education Degree Requirements under general regulation of the Graduate School.

The program of study is determined by the major advisor in cooperation with an advisory committee. The program constitutes a well-organized plan of professional specialization in one of the major fields of education. A minimum of 82 semester hours of work above the bachelor's degree is required for an EdD degree. Continuity of effort must be obtained by at least two semesters beyond the master's degree in which the registration has been two 12-hour semesters or more or three enrollment periods of 8 semester hours or more each completed within an 18-month period. During these semesters, a student may not be employed for more than half-time teaching. With the approval of the major advisor and the dean of the Graduate School, a maximum of two years of graduate work completed in other institutions with recognized graduate schools may be accepted toward the requirements.

Non-resident Research. When the facilities or materials necessitate that work be done away from the UMC campus, a student, upon the recommendation of the advisor and the approval of the Graduate School, may regularly enroll for nonresidence research. To enroll for non-resident research, a student must have already completed 32 semester hours of

acceptable graduate work. Candidates for the EdD may not register for more than 6 semester hours of nonresident work during a given semester; the total amount of nonresident research counted toward the 82 semester hour minimum for the EdD degree is limited to 6 semester hours. The results of nonresident research should be included in a dissertation.

Internship Training. A candidate majoring in some aspect of educational administration and supervision, or in a special field of teaching, who has not had acceptable experience in the field may be required (as part of the program of studies) to work one semester as an intern. This internship, supervised by the candidate's major advisor, is conducted in a school system approved by the College of Education faculty. Not more than 12 semester hours credit (the equivalent of one semester) may be granted for such work. Only students who have completed a minimum of 12 hours beyond the MA or MEd degree (or the equivalent) are eligible for internship credit in administration.

Examination. A matriculation examination must be taken no earlier than the second year of graduate work. The candidate who plans to complete the requirements for the degree by August must take the examination by the preceding December 15.

This examination is given only to students who have completed the requirement in statistics and research methodology mentioned below. The matriculation examination includes the candidate's major fields of interest and is conducted by the major advisor and the advisory committee. The candidate will be advised to pursue further graduate study if results of the examination so indicate.

Before admittance to the matriculation examination, the candidate must give satisfactory evidence of sufficient knowledge of statistics and educational research techniques to enable understanding and utilization of research reports in the field of education. To satisfy this requirement, the student shall have demonstrated competence at the level of a grade of B or higher in the courses Educational Statistics I and II and Foundations of Educational Research. There are no foreign language requirements except as may be determined by the candidate's advisory committee.

A final oral examination on work included in the dissertation also is required. This examination is conducted by the major advisor and the advisory committee.

PHD IN EDUCATION

The program for the degree of doctor of philosophy (PhD) with a major in education, a research degree, is based on work for a master's degree in education or the equivalent.

The dissertation (offered in partial fulfillment of the requirements) must give

evidence of satisfactory mastery of the technical instruments and research procedures in the field of education. Candidates for the PhD in education must demonstrate competence in the area of research by earning credit with grades of B or better in the following courses (or their equivalents): Educational Statistics I, Educational Statistics II, Computer Application to Educational Research and Foundations of Educational Research. Exceptions to one or more of the research foundation courses (for specific applications) must be approved by the divisional director or graduate studies.

Languages and/or language substitutes are not required for the PhD in education. Instead, the College of Education requires a research support area. Competence must be demonstrated in a support area in a UMC department or academic areas other than education by (1) completing a minimum of 12 semester hours of credit with a grade point average of 3.0 or better in courses approved by the student's advisory committee or (2) acceptable performance on an examination administered by the department offering the support area.

The research support area shall be formulated as complementary to research in the major area of specialization. The research support area shall provide a command of a specialized research technique or be relevant to theoretical concepts that will provide added depth and structure to research in the area of specialization.

EDUCATIONAL ADMINISTRATION College of Education

FACULTY

Richard V. Hatley, professor, chairperson, director of graduate studies, EdD, University of New Mexico
James L. Craigmile, professor, EdD, University of Nebraska

Floyd G. Delon, professor, EdD, University of Arizona
Carl C. Fehrle, professor, PhD, University of Iowa
Roger D. Harting, professor, EdD, University of Missouri-Columbia

Charles H. Koelling, professor, EdD, University of Missouri-Columbia
Robert H. Reifschneider, professor, EdD, University of Nebraska

Robert C. Shaw, professor, EdD, University of Missouri-Columbia
Allan W. Sturges, professor, PhD, University of Iowa
Jerry Valentine, associate professor, PhD, University of Nebraska

GRADUATE DEGREES OFFERED

MA or MEd in educational administration with the following emphasis areas: elementary school administration and supervision, general school administration and supervision or secondary school administration and supervision.

EdSp, EdD or PhD in educational administration with the following emphasis areas: administration and supervision of special education, elementary school administration and supervision, general school administration and supervision,

or secondary administration and supervision.

The Department of Educational Administration offers graduate programs designed to prepare individuals for educational leadership positions. Department graduates hold positions such as principals, superintendents, instructional coordinators (department chairpersons, supervisors and team leaders), school public relations officials, school business managers, governmental and private agency leaders, college administrators and professors of educational administration. The department attempts to structure each program within degree requirements to meet individual interests and needs, including state certification requirements for administrators.

See *Education* in this section for general information. Additional information may be obtained from the director of graduate studies, Department of Educational Administration, 211 Hill Hall, (314) 882-8221.

EDUCATIONAL AND COUNSELING PSYCHOLOGY College of Education

FACULTY

Robert Callis, professor, chairperson, PhD, University of Minnesota
Richard A. English, professor, director of graduate studies, PhD, University of Arizona
Donn E. Brolin, professor, PhD, University of Wisconsin-Madison
Robert L. Burton, professor, EdD, University of Oklahoma
Richard R. Caple, professor, EdD, Teachers College, Columbia University
John L. Ferguson, professor, PhD, University of Missouri-Columbia
Norman C. Gysbers, professor, PhD, University of Michigan
Joseph A. Johnston, professor, PhD, university of Michigan
Paul T. King, professor, PhD, Pennsylvania State University
Joseph T. Kunce, professor, PhD, University of Missouri-Columbia
John E. McGowan, professor, EdD, University of Missouri-Columbia
Warren R. Seymour, professor, PhD, University of Missouri-Columbia
Terry D. Tenbrink, professor, PhD, Michigan State University
Richard W. Thoreson, professor, PhD, University of Missouri-Columbia
Frank E. Wellman, professor, PhD, University of Nebraska
James R. Koller, associate professor, PhD, University of Missouri-Columbia
Charles Schmitz, associate professor, PhD, University of Missouri-Columbia
Robert R. Trimble, associate professor, PhD, Oklahoma State University
LeAdelle Phelps, assistant professor, PhD, University of Utah
C. David Roberts, assistant professor, PhD, University of Arizona
Virginia R. Wheeler, assistant professor, EdD, University of Missouri-Columbia
Carl G. Willis, assistant professor, EdD, Oklahoma State University

GRADUATE DEGREES OFFERED
MA, MEd, EdSp and PhD in educational and counseling psychology with the following emphasis areas: counseling, educational, and school.

The graduate program in the Depart-

ment of Educational and Counseling Psychology is designed to meet the specific 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, agencies, clinics, hospitals, business and industry, rehabilitation centers, research laboratories and government service.

See *Education* in this section for general information. Additional information may be obtained from the director of graduate studies, Department of Educational and Counseling Psychology, 16 Hill Hall.

ELECTRICAL ENGINEERING College of Engineering

FACULTY

Charles Slivinsky, professor, chairperson, PhD, University of Arizona
Robert G. Combs, professor, director of graduate studies, PhD, University of Florida
Gayle E. Adams, professor, PhD, University of Wisconsin
Robert L. Carter, professor, PhD, Duke University
Earl J. Charlson, professor, PhD, Carnegie-Mellon University
Dean Franklin, professor, director of Dalton Research Center
Cyrus O. Harbourt, professor, PhD, University of Syracuse
Richard G. Hoft, professor, PhD, Iowa State University
William D. McFarland, professor, PhD, University of Missouri-Columbia
Robert W. McLaren, professor, PhD, Purdue University
Russell Pimmel, professor, PhD, Iowa State University
Byron W. Sherman, professor, PhD, University of Missouri-Columbia
James R. Tudor, professor, PhD, Illinois Institute of Technology
Rex A. Waid, professor, PhD, University of Wisconsin
Donald L. Waidelich, professor, PhD, Iowa State University
Thomas J. Browne, associate professor, PhD, University of Missouri-Columbia
Michael J. Devaney, associate professor, PhD, University of Missouri-Columbia
Turan Gonen, associate professor, PhD, Iowa State University
Huber L. Graham, associate professor, PhD, Massachusetts Institute of Technology
Robert W. Leavene, associate professor, PhD, University of Missouri-Columbia
James E. Rathke, associate professor, PhD, University of Kansas
Harry Tyrer, associate professor, PhD, Duke University
Kenneth Unklesbay, associate professor, PhD, University of Missouri-Columbia
Edward J. Vredenburg, associate professor, MS, University of Missouri-Columbia
Kuno Zimmermann, associate professor, PhD, Lehigh University
Elaine Charlson, assistant professor, PhD, University of Missouri-Columbia
Lein Harn, assistant professor, PhD, Rensselaer Poly Technical Institute
Atsuo Kawamura, assistant professor, PhD, University of Tokyo
James Keller, assistant professor, PhD, University of Missouri-Columbia
Robert O'Connell, assistant professor, PhD, University of Illinois
David G. Skitek, assistant professor, PhD, University of Arizona
M.B. Subrahmanyam, assistant professor, PhD, University of Iowa

GRADUATE DEGREES OFFERED

MS in electrical engineering
PhD in electrical engineering
INTERDISCIPLINARY AREA PROGRAMS
MS in nuclear engineering
PhD in nuclear engineering

The Department of Electrical Engineering offers degree programs leading to a master of science and to the doctor of philosophy. (Information on engineering licenses is detailed in the General Graduate School section under Professional Engineering Registration.)

Graduate study, designed to prepare students for research and advanced design work in industry and for university research and teaching, provides opportunities for theoretical study and for experimental work in several major areas. Areas of study include artificial intelligence, automatic control, antennas and wave propagation, energy systems and resources, bioengineering, solid state, network theory, information systems, integrated circuits and systems, advanced automation, and digital and hybrid computer systems.

Excellent computer equipment and other laboratory facilities, all within the Electrical Engineering Building, are used for applied research sponsored by various government and industry sources of research funding. Especially well-known are the department's research programs in power systems, solid-state power control, and minicomputer/ microcomputer applications in bioengineering and advanced automation.

Fellowships, scholarships, and teaching and research assistantships are available to qualified students. Applications should be submitted by March 1, each year. Additional information including applications for financial support can be obtained from the director of graduate studies.

MASTER'S DEGREE, THESIS AND NON-THESIS OPTION

Acceptance for advisement in the Department of Electrical Engineering is based on a 3.0 or higher GPA (A = 4.0) in all undergraduate work. A student with a GPA less than 3.0 must submit a written petition to the director of graduate studies requesting special consideration for acceptance. The petition must explain the reasons that special consideration is believed to be justified, and it must be accompanied by two letters of recommendation from persons familiar with the applicant's recent engineering or academic work. Consideration is given to the petition, recommendations, grade trends and probability of success in graduate study. Preferably, the student should have a BS in electrical engineering or other science-based curriculum. A student also should have taken the verbal and quantitative engineering sections of the GRE.

To fulfill the requirements for the MS degree, a candidate must complete 30 hours, including at least 15 hours of 400-level courses. A maximum of six hours of graduate credit may be transferred from another campus of the University or another university. A maximum of eight hours of graduate credit may be used from a previous master's degree

completed at the University or elsewhere. All students must complete at least one but not more than 3 credit hours of ECE410 Seminar. At least 24 hours of coursework, exclusive of seminar and research or problems is required. The overall GPA must be at least 3.0. The master's degree must be completed within eight years after the first enrollment. Each candidate must pass a final examination to demonstrate mastery of the work included in the thesis or a substantial independent project.

DOCTORAL DEGREE

Before applying for admission to candidacy, a student must be accepted for advisement in the Department of Electrical Engineering by showing superior performance on the verbal and quantitative parts of the GRE and by having a 3.5 or higher GPA (A = 4.0) in all previous graduate course work. Consideration is given to grade trends, experience, maturity and other criteria bearing on the student's probable success in the program.

To be accepted as a candidate, the student must complete the equivalent of an MS in electrical engineering and demonstrate competency by a written and/or oral qualifying examination conducted by a PhD qualifying committee. Acceptance also requires approval by the electrical engineering faculty.

The advisory committee sets the total hours., about 60 hours of courses beyond the BS are required. Research work for the writing of the doctoral dissertation generally takes about one full year of work.

The candidate must pass a written comprehensive examination in electrical engineering, complete a doctoral dissertation on a topic approved by the committee, and defend the dissertation in an oral final examination.

ENGLISH College of Arts and Sciences

FACULTY

Timothy Materer, professor, chairperson, PhD, Stanford University
Robert Sattelmeyer, associate professor, director of graduate studies, PhD, University of New Mexico
Donald Anderson, professor, PhD, Duke University
J. Robert Barth, S. J., professor, PhD, Harvard University
Robert M. Bender, professor, PhD, University of Michigan
Thomas D. Cooke, professor, PhD, University of Pittsburgh
J. Donald Crowley, professor, PhD, Ohio State University
W. C. Daniel, professor, PhD, Bowling Green State University
Leon T. Dickinson, professor Emeritus, PhD, University of Chicago
John M. Foley, professor, PhD, University of Massachusetts
Howard W. Fulweiler, professor, PhD, University of North Carolina
Charles H. Hinnant, professor, PhD, Columbia University
Richard A. Hocks, professor, PhD, University of North Carolina
James V. Holleran, professor, PhD, Louisiana State University
William V. Holtz, professor, PhD, University of Michigan

Winifred B. Horner, professor, PhD, University of Michigan
William M. Jones, professor, PhD, Northwestern University
Mary M. Lago, professor, PhD, University of Missouri-Columbia
Donald M. Lance, professor, PhD, University of Texas
Speer Morgan, professor, PhD, Stanford University
William M. Peden, professor emeritus, PhD, University of Virginia
M. Gilbert Porter, professor, PhD, University of Oregon
John R. Roberts, professor, PhD, University of Illinois
Martin Camargo, associate professor, PhD, University of Illinois
Albert J. Devlin, associate professor, PhD, University of Kansas
Howard H. Hinkel, associate professor, PhD, Tulane University
Russell J. Meyer, associate professor, PhD, University of Minnesota
Ben F. Nelms, associate professor, PhD, University of Iowa
Catherine N. Parke, associate professor, PhD, Stanford University
Thomas V. Quirk, associate professor, PhD, University of New Mexico
C. Gilbert Youmans, associate professor, PhD, University of Wisconsin
Elaine J. Lawless, assistant professor, PhD, Indiana University
Jean McGarry, assistant professor, MA, Johns Hopkins University
Sherod Santos, assistant professor, PhD, University of Utah

GRADUATE DEGREES OFFERED

MA in English

PhD in English

The English Department offers graduate work leading to the master of arts and doctor of philosophy degrees. Lecture courses, seminars and directed research are available in all historical periods of British and American literature and linguistics, in creative writing and in criticism.

Normally, the master's degree is completed in one calendar year and the PhD within four or five years of full-time study beyond the baccalaureate degree. This does not imply that a candidate must be enrolled full time during the entire duration of doctoral work.

Low grades or a pattern of incomplete and delayed work causes a candidacy to be terminated. The lowest passing grade for graduate work is B (A = 4.0). Consistent B or near B work is not interpreted as satisfactory evidence of PhD ability, and the student with such a record is not encouraged to pursue work beyond the MA level. No grade of C is counted for credit toward the MA or the PhD degree. If a candidate for either degree receives three grades of C or F from at least two different instructors, the department will not continue the candidacy.

MASTER'S DEGREE

An MA candidate should have a baccalaureate degree in English with a minimum of 24 hours, including at least 18 hours in the fields of advanced writing, linguistics and medieval, Renaissance, 17th-century, 18th-century, 19th-century, 20th-century, and American literature, and at least eight hours in such related fields as classics, European history, philosophy and art history; and an under-

graduate GPA of at least B with a better record in English. To apply for admission, candidates must submit transcripts of all undergraduate work, at least three letters of recommendation and results of the GRE.

A student whose undergraduate major is not in English, or not comparable to the degree offered by UMC, may be required to take more than the normal course load for the MA, as determined by the admissions committee.

There are four concentrations within the MA in English: literature, creative writing, language, and junior college or high school teaching.

In the literature emphasis, the MA student is required to take 30 hours of course work, of which at least 15 hours must be in courses numbered 400 or higher. The student must take English 319, the Structure of American English, unless he has had a similar course elsewhere. The student must also take at least one course in six of the seven literary fields: Medieval literature, the Renaissance, the 17th century, the 18th century, the 19th century, American literature, criticism and the 20th century. The student may include in his program not more than six hours in writing courses or in courses outside the department in fields related to English literature.

After the student has completed or is completing at least 30 hours of work for the MA, a comprehensive examination must be successfully completed. After the student has completed or is completing at least 30 hours of work for the MA, he must pass a comprehensive examination, based on the MA Reading List, composed of three parts: (1) one-half hour of short answer identifications, (2) two essay questions on major works of English and American literature, for which the student will have a total of two and one-half hours, and (3) a one-hour critical explication of a short lyric poem, which will be provided for the student at the time of the examination. A student will not be allowed to take the examination more than twice. Normally the final examination will be given in November, April, and July of each year. A student wishing to take the examination must give written notice to the director of graduate studies at least one month before the desired examination date.

In the creative writing emphasis, the student must first submit a sample of creative work (approximately 20 pages of poetry, 30 pages of fiction, or a one-act play). If admitted to the program, 30 hours of course work is required, including 12 hours in creative writing, and either 15 or 18 hours in language and literature. If the student elects to take 15 hours in English or American language and literature, then three hours in a related area outside the department is required, with the consent of the advisory committee. The 12 hours in creative writing must include at least six hours

in 400-level courses. Of the 15 hours in language and literature, the student must take at least nine hours in courses numbered 401 or higher, and at least one course in five of the seven literary fields or in linguistics.

The student must complete a substantial body of work (approximately 70 pages of fiction or drama or 40 pages of poetry or some reasonable combination) of professional quality, which must be approved by the Advisory Committee during the student's final semester. The student must also pass the same comprehensive examination as that given to master's students in the literature concentration.

Student's concentrating in the English language must take the following: (1) 15 semester hours in English language courses; (2) six to nine hours in literature courses; (3) six to nine hours in electives which may be additional courses in English language and literature or courses in such fields as anthropology, education, foreign languages and literature, history or linguistics. The only two required courses for this concentration are English 319, *The Structure of American English*, and English 320, *The History of the English Language*. This program offers a great deal of flexibility so that each student, with the approval of his advisor, designs a program with a particular emphasis. Such an emphasis could be in any one of the following programs: Teaching English as a Second Language (TESL); English Language and Literature; Sociolinguistics; or Language Education. For further details, contact the director of graduate studies.

The emphasis for junior college or high school teaching is a flexible program designed primarily for experienced teachers of English. Candidates in this program take 30 hours of course work, of which at least 15 hours must be in courses numbered 400 or higher. Within this total program the candidate must take (1) nine hours of courses designed primarily for teachers of English; (a) English 306, *Theory and Practice of College Composition*; (b) English 416, *Critical Approaches to Literature*; (c) and English 411, *Studies in English Education: Teaching Writing in High School and College*; (2) 12 hours in courses in English and American Literature, composed on one course in each of four of the following fields: medieval, the Renaissance, the 17th-century, the 18th-century, the 19th-century, American literature, and the 20th-century (exclusive of courses in criticism); (3) nine hours in additional courses in English or in fields related to the teaching of English such as art history, classical studies, sociology and speech; if, however, the student has not taken English 319 (or its equivalent elsewhere), English 319 must be taken as part of these nine hours.

Students in any concentration may write a thesis on a topic approved by the

advisor and the department. The thesis will count as six hours of the student's MA program.

Although normally a student would take all his course work in residence at the University, up to six hours of credit from graduate work done previously at another university may be transferred with the permission of the Graduate Studies Committee. Once they have entered the program at UMC, students may take six hours of credit off campus (unless they have already transferred six hours' credit from elsewhere) with the prior consent of the Graduate Studies Committee.

All MA comprehensives are graded by committees appointed by the director of graduate studies; the committees are normally made up of faculty members who teach in the candidate's area of concentration. The comprehensive exams may be taken in the semester when the candidate is completing or has completed 30 hours of course work. There are four possible grades for each exam: high pass, pass, low pass, and fail. A student receiving two or more failing votes fails the exam. Any candidate who fails may take the comprehensives a second time. A student receiving more than one grade of low pass would normally not be allowed to enter the PhD program.

PHD DEGREE

A PhD candidate must hold an MA degree in English or have completed at least 30 hours in graduate work in the field. Transcripts for all college work, three letters of recommendation, results of the GRE (both Aptitude Test and Advanced Test in Literature) and a substantial sample of written work (such as term papers) must be submitted for admission. Only those applicants who evidence a clear likelihood of successful doctoral work are admitted. Before registering for courses, the student must confer with the director of graduate studies who acts as advisor until a regular advisor is assigned.

For candidacy acceptance, the advisory committee, appointed by the director of graduate studies, must certify the student and approve the course of study. In addition, the student is required to meet with the advisor committee for a qualifying examination during the first semester of PhD course work.

A student remains a candidate in good standing so long as work reflects good progress toward the degree. The PhD candidate must take approximately 30 hours of graduate work beyond the MA, at least half of which must be at the 400 level. (Credit granted for English 490 is excluded from this total. A maximum of three hours can be granted for English 400 only after written permission is obtained from the Graduate Studies Committee.)

Excluding research hours, a minimum of 24 hours of course work beyond the MA must be completed in residence at

the Columbia campus, must be in English and are usually the last hours taken. With approval of the advisory committee and the Graduate Studies Committee, the student may transfer up to 12 hours from another university.

In addition, the candidate must have had or will be required to take (1) a course in structure of the English Language (319, 417 or an equivalent course elsewhere); (2) a course in historical aspects of the English language (320, 418 or an equivalent course elsewhere); (3) a course in bibliography and methods of research (401 or its equivalent elsewhere); and (4) a course in the history or theory of literary criticism (416 or its equivalent elsewhere). A candidate may take up to nine hours of course work outside the department in a field or fields related to the program of study.

Students in English language and linguistics will follow the program of course work determined by their advisory committee, including 24 hours of English and American literature; their outside area will be in linguistic theory.

A student may satisfy the foreign language requirement for the PhD in English in one of two ways: (1) by demonstrating a knowledge of one foreign language and its literature at the fourth-year college level. If this option is chosen, the student must satisfy the requirement by passing with a grade of B or better two upperclass courses in the literature of the language chosen. These courses may not be in translation, must be either at the 200 level or above at the University of Missouri-Columbia or the equivalent elsewhere. If taken elsewhere, they must have been completed within five years of the candidate's enrollment in the PhD program. French, German or Latin will be automatically accepted as fulfilling this requirement. Another language may be substituted with the consent of the student's Advisory Committee. (2) A student may satisfy the foreign language requirement for the PhD in English by passing ETS examinations in two foreign languages with a minimum score of 510 for French, 470 for Spanish, or 480 for German.

All language requirements must be satisfactorily completed before the candidate is eligible to take the comprehensive examination; consequently, students are urged to do so early in their programs.

At least seven months before taking the final oral examination, the candidate must pass the comprehensive examination, consisting of three parts: (1) a six-hour written exam over English and American literature; (2) a six-hour written exam over the candidate's special field; (3) a two-hour oral over the special field. Upon satisfactory completion of the written part, the student is given an oral examination of approximately two hours duration by the examining committee.

The dissertation and the final oral ex-

amination on the dissertation and its field complete the requirements for the PhD in English.

ENTOMOLOGY College of Agriculture

FACULTY

- Thomas R. Yonke**, professor, chairperson, PhD, University of Wisconsin
Robert D. Hall, associate professor, director of graduate studies, PhD, Virginia Polytechnic Institute
G. Michael Chippendale, professor, PhD, University of Wisconsin
Wilfred S. Craig, professor, PhD, Iowa State University
Mahlon L. Fairchild, professor, PhD, Iowa State University
Armon J. Keaster, professor, PhD, University of Missouri-Columbia
Charles O. Knowles, professor, PhD, University of Wisconsin
Dean Barry, adjunct professor, PhD, Texas A&M University
Carlo M. Ignoffo, adjunct professor, PhD, University of Minnesota
Flernoy G. Jones, associate professor, PhD, Mississippi State University
Ralph E. Munson, associate professor, PhD, Iowa State University
Mathew H. Greenstone, adjunct associate professor, PhD, University of California-Berkeley
Arthur H. McIntosh, adjunct associate professor, ScD, Harvard University
William W.M. Steiner, adjunct associate professor, PhD, University of Hawaii
Elaine A. Backus, assistant professor, PhD, University of California-Davis
Rick L. Brandenburg, assistant professor, PhD, North Carolina State University
Marc J. Linit, assistant professor, PhD, University of Arkansas

GRADUATE DEGREES OFFERED MS in entomology PhD in entomology

The Department of Entomology offers graduate programs leading to the master of science and doctor of philosophy degrees. A student can select training from a wide range of courses and research programs to fit the needs for a career in any of the many areas of professional entomology, including research, teaching, industry and extension work. Current research programs in the department emphasize the following areas: biological and chemical control, ecology, forest entomology, host-plant relations, insecticidal residues, medical and veterinary entomology, morphology, nutrition, pest management, physiology and biochemistry, systematics, and toxicology.

The department has eight major research laboratories totaling 7,000 square feet, as well as preparation rooms, classrooms and teaching laboratory facilities. The research laboratories are equipped with a wide range of instruments and environmental growth chambers for advanced study. The department also has access to the Experimental Station electron microscopes and chemical and spectroscopic laboratories. Occupying 2,000 square feet, the entomology research museum provides many opportunities for research in systematic entomology. The collection, including insects, spiders, and mites, is the largest in the state.

Excellent library facilities on campus include Ellis Library and up-to-date medi-

cal and veterinary branch libraries. The computing center and nuclear reactor also offer facilities for more specialized research.

Field research scientists are served by greenhouses on campus and a 40-acre entomology farm located near Columbia. Eight other Experiment Station farms provide many opportunities for studying the various insect problems which exist throughout the state. For those interested in ecology, the state offers a large acreage of natural wildlife reserves, including Tucker Prairie and Ashland Arboretum, both within 25 miles of Columbia.

The department also conducts cooperative research projects with the USDA Biological Control of Insects Research Laboratory and the USDI Fish Pesticide Research Laboratory, both located in Columbia.

Research assistantships are available to qualified students. The annual stipend is \$7,200 for student with the BS degree and \$8,200 for those with the MS degree. In addition, several scholarship awards are given annually. For further information, write the director of graduate studies or a specific staff member, Department of Entomology, 1-87 Agriculture Building.

MASTER'S DEGREE

A screening committee determines admission to the department. The applicant must submit official transcripts from all colleges attended, three letters of recommendation from professors, a letter of intent, and GRE scores. The degree program is arranged by the student and the advisor. Although there are some departmental requirements, the program is flexible to meet individual needs. To fulfill the degree requirements, a candidate must (1) meet all Graduate School requirements, (2) prepare a thesis, and (3) complete a final oral examination.

DOCTORAL DEGREE

The same policy holds for admission as a PhD candidate as for the MS applicant. The flexible PhD program is arranged by the student's advisory committee. Special emphasis is placed on developing the student's research aptitude. Although a qualifying examination is required for all transfer students, the final oral examination for the MS degree may serve in lieu of a qualifying examination for those students who continue in the department's graduate program. The language requirement can be met by appropriate credit in one language or one collateral field. A written and oral comprehensive examination, a dissertation and a final oral examination are required.

EXTENSION EDUCATION College of Agriculture

FACULTY

- Richard L. Lee**, professor, chairperson, PhD, University of Iowa

- John L. Mowrer**, professor, director of graduate studies, PhD, University of Missouri-Columbia
Delmar Hatesohl, professor, PhD, Oklahoma State University

GRADUATE DEGREES OFFERED MS in extension education

The Department of Extension Education provides graduate work leading to the master of science degree. The program is designed for students whose interests lie in the fields of extension and/or informal adult education. Course work includes program development, evaluation, adult learning, educational methods, organization and administration.

The department, cooperating closely with related areas of study, encourages degree candidates to select a minor or at least an area of concentration from such departments as community development, sociology, recreation and park administration and related education courses. Appropriate emphasis is given to research and its relationship to the extension function of a university.

The department provides access to numerous non-cataloged extension and adult education materials prepared by state and national organizations.

Staff members hold joint appointments in the department and in the UMC Extension Division. This arrangement gives students access to field training and other opportunities for direct experience and education in the programs of the Extension Division.

MASTER'S DEGREE

Admission is limited to those students having a baccalaureate degree and a minimum of two years extension or related informal teaching experience. However, an applicant with a 3.0 (A=4.0) or the equivalent undergraduate GPA during the last two years of undergraduate work may be admitted on the basis of this record alone. Acceptable performance on the GRE, may qualify a student where the undergraduate grade point is questionable. Consideration is given to grade trends, performance in the major area of study, experience and maturity.

The MS program, requiring a minimum of 32 semester hours of course work, with at least 16 hours at the 400 level, is selected in consultation with an assigned advisor.

A thesis is not required, but each candidate must complete a special project research report carrying a maximum of four credit hours.

FAMILY AND COMMUNITY MEDICINE School of Medicine

FACULTY

- Jack M. Colwill**, professor, chairperson, MD, University of Rochester
Michael C. Hosokawa, professor, director of graduate studies, EdD, University of Oregon
William C. Allen, professor, MD, MPH, University of Nebraska
A. Sherwood Baker, professor emeritus, MD, MSPH, University of Illinois

Margaret A. Flynn, professor, PhD, University of Missouri-Columbia
Derek G. Gill, professor, PhD, University of Aberdeen (Scotland)
Richard M. Hessler, professor, PhD, University of Pittsburgh
Gerald T. Perkoff, professor, MD, Washington University (St. Louis)
Andrew C. Twaddle, professor, PhD, Brown University
Hans O. Mauksch, professor emeritus, PhD, University of Chicago
William D. Bradshaw, associate professor, MD, University of Kansas
Edward E. Brent, associate professor, PhD, University of Minnesota
John K. Glenn, assistant professor, PhD, MSPH, University of Missouri-Columbia
Roger W. Hofmeister, associate professor, MD, MSPH, University of Illinois
Stanley R. Ingman, associate professor, PhD, University of Pittsburgh
Georgia B. Nolph, associate professor, MD, Women's Medical College of Pennsylvania
Jerry A. Royer, associate professor, MD, University of Indiana
D. Thomas Vernon, associate professor, PhD, University of Chicago
Robert L. Blake Jr., assistant professor, MD, Washington University (St. Louis)
James Campbell, assistant professor, PhD, University of Missouri-Columbia
Bernard Ewigman, assistant professor, MD, MSPH, University of Missouri-Columbia
Joycellen Floyd, assistant professor, MD, MSPH, University of Missouri-Columbia
Richard Gengelbach, assistant professor, MD, University of Missouri-Columbia
Melvin Hector, assistant professor, MD, University of Missouri-Columbia
Mark Hoerl, assistant professor, MD, University of Missouri-Columbia
Coleen H. Kivlahan, assistant professor, MD, MSPH, University of Missouri-Columbia
Michael Lefevre, assistant professor, MD, MSPH, University of Missouri-Columbia
Kristi Roberts, assistant professor, PhD, University of Missouri-Columbia
Vicki Straub, assistant professor, PhD, University of Arizona
James Watson, assistant professor, MS, Stanford University
Harold Williamson, assistant professor, MD, MSPH, University of Minnesota
Harley Wright, assistant professor, MSPH, University of Missouri-Columbia
Steven C. Zweig, assistant professor, MD, MSPH, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MS in public health

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. The educational objective of the graduate program is to provide health professionals with an opportunity to acquire background, knowledge, attitudes, values and skills in family and community medicine.

The graduate programs leading to the master of science in public health include a combination of coursework, research and field experience. Courses are designed to cover the basic sciences of public health. A minimum of 9 to 11 months of full-time enrollment should be anticipated. The program requirements include 30 hours of graduate coursework and the completion of an original research project.

To qualify for admission, an applicant must have completed doctoral level training in a health profession. Applicants must be admitted to the Graduate School,

submit a completed application and three letters of recommendation. For additional information write director of graduate studies, Department of Family and Community Medicine, Health Services Center, University of Missouri-Columbia, Columbia, Mo. 65212.

FAMILY ECONOMICS AND MANAGEMENT

College of Home Economics

FACULTY

Edward J. Metzen, professor, chairperson, EdD, University of Missouri-Columbia
Marilyn Caselman, associate professor, MS, Ohio State University
Sandra A. Helmick, associate professor, PhD, University of Missouri-Columbia
Anna Cathryn Yost, associate professor, MS, Purdue University
Melchior J. Zelenak, assistant professor, PhD, University of Iowa

GRADUATE DEGREES OFFERED

MS in family economics and management

PhD in home economics with emphasis area in family economics and management

The Department of Family Economics and Management offers graduate study leading to the degree of master of science and doctor of philosophy in home economics with emphasis in family and consumer economics. Both the MS and PhD programs encompass a broad, but integrated, array of dimensions of family and consumer economics; the focus includes household and consumer economic conditions and behavior, economic and social policy, and the interrelationships among those elements. Students' programs capitalize upon competencies and professional interests through independent study and selection of courses to supplement the focus of the program (economic theory, consumer behavior and marketing, finance, family development, demographics, political science, mass communication media). Preparation may include research, teaching and/or internships in addition to program requirements.

The MS degree prepares students for college teaching, consumer affairs positions, social service agencies, extension or other adult education programs, financial counseling agencies, consumer journalism, and other positions in business and public institutions. The PhD degree qualifies students for teaching and research at the university level, and for other research or administrative positions.

See *Home Economics* in this section for general information. Additional information may be obtained from the chairperson, Department of Family Economics and Management, 238 Stanley Hall.

FINANCE

College of Business and Public Administration

FACULTY

Gary L. Trennepohl, associate professor, chairperson, DBA, Texas Tech University

The Departments of Finance, Marketing and Management in the School of Business jointly offer the master of business administration and the doctor of philosophy inter-disciplinary degrees in business administration. Program information and requirements are given under the area heading Business Administration in this catalog.

FOOD SCIENCE & NUTRITION

College of Agriculture

FACULTY

William C. Stringer, professor, chairperson, director of graduate studies, PhD, University of Missouri-Columbia
Milton E. Bailey, professor, PhD, Louisiana State University
Owen J. Cotterill, professor, PhD, The Ohio State University
Joseph E. Edmondson, professor, PhD, Iowa State University
Marion L. Fields, professor, PhD, Purdue University
Harold B. Hedrick, professor, PhD, University of Missouri-Columbia
Robert T. Marshall, professor, PhD, University of Missouri-Columbia
H. Donald Naumann, professor, PhD, University of Missouri-Columbia
Ruth E. Baldwin, professor emeritus, PhD, University of Wisconsin
Harold J. Bassett, professor emeritus, PhD, University of Wisconsin
Maynard E. Anderson, associate professor, PhD, University of Missouri-Columbia
Dennis T. Gordon, associate professor, PhD, University of Connecticut
Robert F. Lukowski, associate professor, EdD, University of Massachusetts
Nan Unklesbay, associate professor, PhD, University of Wisconsin-Madison
Dean S. Shelley, assistant professor, MS, University of Missouri-Columbia
Kenneth J. Prusa, assistant professor, PhD, Kansas State University

GRADUATE DEGREES OFFERED

MS in food science

PhD in food science

Graduate work in the Department of Food Science and Nutrition is designed to develop students for research or advanced professional careers in the food industry. Selected careers include teaching and research at the college level, research and development for private industry or the federal government, food plant supervision, technical operation, quality assurance, product development, nutrition, distribution, food service and food regulatory work.

Departmental cooperation with the food industry is excellent in both on- and off-campus programs. Special facilities for food science study and research include (1) chemical and microbiological laboratories and (2) pilot plants to study food processing.

Assistantships are available to qualified students from funds provided by the Agricultural Experiment Station, research contracts and/or grants. Fellowships supported by industry and professional societies, based on national competition, are also available. Submit application for assistantships and/or fellowships to the Department of Food Science and Nutrition, 228 Eckles Hall, by January 1 of

each year. Additional information pertaining to courses of study, assistantships or other material can be obtained from the department chairperson.

MASTER'S DEGREE

The master's degree is designed primarily for individuals interested in specializing in areas of food science, food service or food distribution. The individual program is built around a core of courses in food science, with supporting courses from the disciplines of chemistry, microbiology, physiology, nutrition, economics, marketing, management and statistics.

Admission requires a BS or AB degree and an undergraduate record which indicates promise for successful completion of graduate studies. Departmental selection of students is based on previous academic performance, academic background and potential as determined by the GRE and reference letters.

To satisfy degree requirements, a candidate must (1) complete an approved program of study; (2) prepare a thesis or, if a non-thesis option is chosen, prepare a research paper acceptable in an appropriate refereed journal based on the student's research planned and conducted by the student in concert with the advisor; and (3) pass a final oral examination over course work and research. The thesis or research paper is reviewed by each member of the final examining committee.

DOCTORAL DEGREE

Requiring a minimum of two 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 (1) satisfactorily complete the master's degree program or its equivalent with a GPA of 3.0 or better; (2) satisfactorily complete the written and oral qualifying examination; (3) show evidence of satisfactory performance in the major area of study, inclusive of grade trends; and (4) comply with other Graduate School requirements for formal admittance to candidacy for the PhD.

The program, under the guidance of an advisory committee, consists of (1) a course of study designed to fit the individual student's academic background and objectives, consisting of approximately one-third research credit (the remainder of courses to be selected from food science and other supporting areas of chemistry, microbiology, physiology, nutrition, economics, marketing, management and statistics); (2) acceptable master's degree program; and (3) acceptance of a dissertation proposed and defended by the student.

To satisfy degree requirements, a candidate must complete the program of study, demonstrate proficiency in one foreign language or complete 9 credit hours in a designated collateral field, pass the comprehensive examination over the approved course of study, and present an acceptable dissertation and defend it in a final examination.

FORESTRY, FISHERIES & WILDLIFE

School of Forestry, Fisheries and Wildlife

FACULTY

Donald P. Duncan, professor, director, PhD, University of Minnesota

FORESTRY

Gray S. Henderson, director of graduate studies, professor, PhD, Cornell

Merton F. Brown, professor, PhD, University of Iowa

Gene S. Cox, professor, PhD, Duke University

Harold E. Garrett, professor, PhD, University of Missouri-Columbia

William B. Kurtz, professor, PhD, University of Arizona

E. Allen McGinnis, professor, PhD, New York State College of Forestry

Lee K. Paulsell, professor, MS, University of Missouri-Columbia

Carl D. Settergren, professor, PhD, Colorado State

Hardeep S. Bhullar, associate professor, PhD, University of Georgia

Bruce E. Cutter, associate professor, PhD, University of Missouri-Columbia

Alan R. Everson, associate professor, PhD, University of Texas A&M

Milton F. George, associate professor, PhD, University of Minnesota

Stephen G. Pallardy, associate professor, PhD, University of Wisconsin

James P. Pastoret, associate professor, MWT, University of Michigan

Marc J. Linit, assistant professor, PhD, University of Arkansas

Kim E. Lowell, assistant professor, PhD, University of Canterbury

FISHERIES & WILDLIFE

John R. Jones, director of graduate studies, professor, PhD, Iowa State University

Richard O. Anderson, professor, PhD, Michigan State University

Thomas S. Baskett, professor, PhD, Iowa State University

Leigh H. Fredrickson, professor, PhD, Iowa State University

Erik K. Fritzell, associate professor, PhD, University of Minnesota

Charles R. Rabeni, associate professor, PhD, University of Maine

Thomas G. Coon, assistant professor, PhD, University of California-Davis

Terry R. Finger, assistant professor, PhD, Oregon State University

Roger L. Pederson, assistant professor, PhD, Iowa State University

Mark R. Ryan, assistant professor, PhD, Iowa State University

Ernie P. Wiggers, research assistant professor, PhD, Texas Tech University

GRADUATE DEGREES OFFERED

MS in forestry

MS in fisheries and wildlife

PhD in forestry

PhD in fisheries and wildlife

FORESTRY

Graduate education in forestry has three primary objectives: (1) to provide, through either master's-or doctoral-level education, forest scientists to meet the research and teaching needs basic to the forestry profession; (2) to provide greater depth in specialized fields for forestry graduates desiring a fifth year of professional education at the master's level; and (3) to offer opportunity for professional forestry education at the master's level to the holder of the baccalaureate degree with a major in one of the biological, physical or social sciences.

Forestry graduates interested in research or teaching may concentrate much of their course work in one or more of the related sciences with a thesis subject appropriate to forestry. The dissertation may be directed toward the solution of problems faced by the practicing forester, or may consist of fundamental investigations pertinent to the solution of such problems.

Specialized graduate education is available in several subfields of forestry: biometrics, ecology, economics, entomology, hydrology, land-use planning, mensuration, pathology, photogrammetry, physiology, policy, recreation, silviculture, soils, timber management, water quality and wood science.

The school works closely with the North Central Forest Experiment Station, Forest Service, USDA. In addition, excellent cooperation is maintained with the Missouri Department of Conservation, and the Department of Natural Resources.

The school and the University have direct control over some 9,600 acres of forested lands on which forestry research is underway. These are in three tracts near Columbia and Poplar Bluff and represent a variety of forest types and conditions. Access to other forest lands, both state and federal, is available through cooperative agreements.

Facilities on the Columbia campus include a chemical analytical laboratory, a large nuclear reactor, an IBM 370-168 computer, electron microscopes, other specialized laboratories and equipment and the UMC Ellis Library.

Admission for graduate work in forestry is based upon three criteria: (1) Undergraduate scholastic performance. A 3.0 (A = 4.0) GPA or better is highly desirable. Particular attention is given to the record of the last two years of undergraduate study, or in the case of one who has been employed for several years, the type and quality of experience since completion of the undergraduate degree, (2) letters of recommendation by individuals qualified to evaluate scholarly capacity; and (3) performance on the GRE Aptitude Test. Doctoral candidates must demonstrate a higher level of achievement in each of these criteria.

Some graduate students qualify for McIntire-Stennis funds or state research support for assistantships, or for NSF or other fellowships. Write the director of graduate studies, Forestry, 1-30 Agriculture Building for information.

MASTER'S DEGREE

The MS 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. Students with previous professional education in forestry may wish to undertake preliminary preparation for both research and teaching or may wish to obtain greater depth in a specialized area of forestry. Those without a baccalaureate

laureate degree in forestry may wish to further their education in forest science or to attain professional competence by completing required course work.

Course work required of students without a previous forestry degree who desire a professional forestry education includes: dendrology, utilizing forest resources, resource measurements, forest inventory, forest fire control and use, silvics, silviculture, forest photogrammetry, watershed management, timber management, forest economics, recreational land management, public resource policy, management-utilization trip and land use planning. Several of these courses do not carry graduate credit.

To attain the master's degree, 30 hours of course work must be completed; 15 hours or more shall be numbered 400 or above. Research, problems, special investigations and special readings courses shall not exceed 12 of the 30 hours. Research toward a thesis normally shall not exceed 8 hours. The GPA of all course work submitted for the degree must be B (3.0) or better.

A thesis, or a minimum of five semester hours of non-thesis research acceptable to the student's graduate committee, shall be completed prior to the final examination. A final oral examination is given to all candidates before completion of the degree.

DOCTORAL DEGREE

The PhD degree in forestry is designed to prepare students for research, college teaching or other advanced scientific or professional careers. The student pursuing the doctoral program is expected to complete satisfactorily qualifying, comprehensive and final examinations. The qualifying examination determines whether the student's background is adequate to enter the PhD program, and ascertains areas of weakness in which a candidate will be required to gain background through appropriate course work. The comprehensive examination also has two objectives: (1) to ascertain whether 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 knowledge in new situations and to integrate that knowledge toward the solution of theoretical or applied problems. The final examination is directed primarily toward exploration of the dissertation.

Requirements concerning foreign languages and knowledge of a collateral field, if any, are determined by the student's advisory committee. Each advisory committee is expected to make a realistic assessment of the student's needs as they relate to the student's background and educational objectives.

An independent scholarly dissertation on a subject approved by the student's advisor and committee must be completed in a form acceptable to the final examining committee, which must re-

present at least two disciplines in addition to the major field.

The requirements for this degree are not completely specified in terms of time or course work, but the student must complete a minimum of three full years of graduate study beyond the bachelor's degree. The degree is conferred only upon those students who, after extensive study, have demonstrated high attainment in their particular specialization in forestry and who have completed independent research contributing to knowledge in the field.

FISHERIES & WILDLIFE

Graduate programs in fisheries, limnology or wildlife are designed to prepare students for professional careers in these areas with state and federal agencies, consulting firms or academic institutions.

The programs are administered and directed through a cooperative agreement between the University of Missouri, Missouri Department of Conservation and the United States Fish and Wildlife Service. The agreement is formalized in the Missouri Cooperative Fish and Wildlife Research Unit.

The fisheries and wildlife group has well-equipped laboratories and an aquarium facility on campus. In addition, the Ashland Wildlife Research Area, including 2,400 acres with a 20-acre lake, offers a diversity of habitat for field-oriented studies. The University has established near Puxico, Missouri, the Gaylord Memorial Wildlife Research Laboratory. Located on the Missouri Department of Conservation's Duck Creek Wildlife Area, the laboratory is in the last of the swamps of Missouri, and adjacent to the Mingo National Wildlife Refuge.

An applicant contemplating graduate work in fisheries, limnology or wildlife should have a good background in the biological and physical sciences, including biology or botany and 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 and physics. A background of 25-30 hours in biological courses is desirable and major deficiencies in this area will be remedied during the graduate program.

Admission is based upon three criteria; (1) the GRE, including the advanced test in biology; (2) three letters of recommendation from persons who can attest to the candidate's scholastic ability; and (3) the undergraduate scholastic performance.

A 3.0 or higher GPA is highly desirable; particular attention is given to the last two years of undergraduate study or experience subsequent to graduation.

There is a limited number of fellowships and teaching and research assistantships for qualified students. Application for graduate study may be obtained by writing to the director of graduate studies, Fisheries and Wildlife, 112 Stephens Hall.

MASTER'S DEGREE

To attain the master's degree a student must complete, with a B (3.0) average or better, 30 hours of course work (15 hours or more numbered 400 or above). Research, problems, special investigations and special readings courses shall not exceed 12 of the 30 hours.

A thesis acceptable to the student's graduate committee shall be completed before the final oral examination, which is given to all candidates before completion of the degree.

DOCTORAL DEGREE

The objectives of and the requirements for a PhD in fisheries and wildlife are the same as those detailed for the PhD in forestry.

GENETICS AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

GEOGRAPHY

College of Arts and Sciences

FACULTY

Walter A. Schroeder, chairperson, MA, University of Chicago

Jesse H. Wheeler, Jr., professor, director of graduate studies, PhD, University of Chicago

Wayne L. Decker, professor (atmospheric science), PhD, Iowa State University

Gary E. Johnson, associate professor, PhD, Indiana State University

J. Trenton Kostbade, associate professor, PhD, University of Michigan

Gail S. Ludwig, associate professor, DA, Northern Colorado University

William A. Noble, associate professor, PhD, Louisiana State University

Robert F. Austin, assistant professor, PhD, University of Michigan

GRADUATE DEGREES OFFERED

MA in geography

The Department of Geography offers two plans leading to the master of arts degree, a thesis and a non-thesis option. Both options require 32 hours of graduate credit and prepare students for teaching at the high school, junior college and college levels; for jobs in urban and regional planning; and for various positions in government service in such areas as resource management, cartography and intelligence.

The department emphasizes close contact between staff and graduate students. Individualized graduate programs allow latitude in areas of specialization such as regional, physical, economic or urban geography; cartographic design; applied geography; environmental studies; and geographic education. Strong collateral course work in such fields as anthropology, atmospheric science, computer science, economics, geology, history, planning and sociology meets the special interests of many graduate students.

An exceptional departmental collection of reference materials - including maps, journals, books and aerial photographs - is available to graduate students. The holdings of Ellis Library in geogra-

phy and related fields are extensive, and the UMC computer facilities are readily available.

Awarded on a competitive basis, graduate teaching assistantships are available. Applicants desiring consideration for one of these positions should indicate this in their applications to the department.

Applicants for the master of arts program with an undergraduate GPA of at least 3.0 (A=4.0) during the last two years of undergraduate work may be admitted on the basis of this record alone. Certain circumstances may qualify some applicants with lower grade point averages to be admitted on probation. Letters of recommendation may be used to strengthen applications. All applicants should submit GRE scores to the department as early as possible. These scores should include the verbal and quantitative parts of the examination and may include the geography or other subject-matter examinations.

Address inquiries to director of graduate studies, Department of Geography, Stewart Hall UMC, Columbia, MO 65211.

MASTER'S DEGREE

Undergraduate preparation for graduate work in geography normally should include a minimum of 18 semester hours in undergraduate courses in geography. Students with excellent undergraduate records, including considerable work in fields closely related to geography, may be admitted to graduate work with fewer undergraduate hours, but may be required to extend their graduate programs to remedy deficiencies.

The master of arts degree requires completion of 32 semester hours of course work; 8 hours may be thesis research for the students taking a thesis option. Fifteen or more of these hours must be in courses numbered 400 or above. The program of courses is selected jointly by the student and the adviser, designated during the first semester in residence. All candidates must pass a comprehensive written and/or oral examination at the end of their graduate work. Students taking the thesis option must defend the thesis.

GEOLOGY

College of Arts and Sciences

FACULTY

- Thomas J. Freeman**, professor, chairperson, PhD, University of Texas
James H. Stitt, professor, director of graduate studies, PhD, University of Texas
Raymond L. Ethington, professor, PhD, University of Iowa
Glen R. Himmelberg, professor, PhD, University of Minnesota
William D. Johns, professor, PhD, University of Illinois
George W. Viele, professor, PhD, University of Utah
David W. Houseknecht, associate professor, PhD, Penn State University
Kenneth R. Applin, assistant professor, PhD, Penn State University
Robert L. Bauer, assistant professor, PhD, University of Minnesota
Joesph Engeln, assistant professor, PhD, Northwestern University

- Peter Nabelek**, assistant professor, PhD, SUNY Stony Brook
Thomas Owens, assistant professor, PhD, University of Utah
Kevin Shelton, assistant professor, PhD, Yale University
Michael B. Underwood, assistant professor, PhD, Cornell University

GRADUATE DEGREE OFFERED

MA in geology

PhD in geology

The Department of Geology offers graduate work leading to the master of science and the doctor of philosophy degrees. The areas of specialization are carbonate petrology, clay mineralogy, sandstone petrology, geochemistry, geophysics, igneous petrology, metamorphic petrology, micropaleontology, ore deposits, invertebrate paleontology, sedimentation, stratigraphy, structural geology and tectonics.

Adequate space and excellent facilities are available for research in the Geology Building, which also houses an excellent geology library. Modern and sophisticated equipment is available for supervised student use in many fields. The department maintains one of the best conodont collections in the world for teaching and research. The Geology Field Camp is in the Wind River Mountains near Lander, Wyoming.

Several scholarships, assistantships, fellowships and other sources of financial aid are available. Write for information and applications to director of graduate studies, Geology Building, UMC, Columbia, MO 65211.

GRADUATE PROGRAMS

Preparations for a graduate degree in geology should include a minimum of 24 semester hours in geology, plus 6 or more semester hours in an approved field course (or equivalent field experience): 8 semester hours of chemistry (physical chemistry for students specializing in mineralogy, petrology or geochemistry); 8 semester hours in physics; 8 semester hours in analytical geometry, calculus or statistics; and 5 semester hours in zoology or biology. Students specializing in paleontology should have work in invertebrate zoology and genetics. A reading knowledge of at least one foreign language is desirable.

Students enrolled for graduate credit in any course are required to have shown proficiency (grade of B for the graduate student, or C for the undergraduate) in the listed prerequisite course or courses.

Every student applying to the graduate program in geology at UMC must present scores for the verbal, quantitative, and analytical part of the Graduate Record Examination (GRE). Any student who intends to enter the program with a bachelor's degree in geology must, in addition, present a score for the advanced (i.e., geology) part of the GRE.

All international students whose native language is not English must submit their TOEFL scores as a prerequisite for admission.

GERMANIC AND SLAVIC STUDIES

College of Arts and Sciences

FACULTY

- Ruth H. Firestone**, associate professor (German), chairperson, PhD, University of Colorado
Dennis M. Mueller, professor (German), director of graduate studies, PhD, Washington University (St. Louis)
Ernst Braun, professor (German), PhD, University of Wisconsin
James M. Curtis, professor (Russian), PhD, Columbia University
Adolf E. Schroeder, professor (German), PhD, Ohio State University
James F. Peters, associate professor (German), PhD, University of Washington
Naomi Ritter, associate professor (German), PhD, Harvard University
Luverne Walton, associate professor (German), PhD, University of Indiana

GRADUATE DEGREES OFFERED

MA in German

The Department of Germanic and Slavic Studies offers a course of study leading to the master of arts in German. The program is designed to prepare students for admission to PhD programs, as well as for professional language careers in a number of fields. Courses in language, linguistics, literature and 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 the subject area.

Resources include extensive library holdings in Germanic literature and linguistics, periodical and book collections in methodology and an electronically equipped audiovisual laboratory for language training. Opportunity for supervised teaching is available to teaching assistants.

Applicants for admission to the graduate program must have an undergraduate degree from an accredited college or university or the equivalent, a GPA of B (3.0) or higher and an undergraduate major in German or the equivalent. The department reserves the right to evaluate the work presented for admission and to determine the student's academic needs.

Students must complete a minimum of 30 hours of graduate-level courses with a GPA of B (3.0) or higher. No fewer than 24 hours are to be earned in German courses; at least 15 hours must be taken in German courses numbered 400 or above. A thesis or the equivalent, with a maximum of 6 hours credit, is required.

Courses taken outside the department should complement the student's program of study and require the approval of the departmental adviser. No language other than German is required.

Information regarding specific course requirements can be obtained by writing to the department chairman.

Candidates for the MA degree must pass comprehensive written and oral final examinations based on course work and the departmental reading list.

GERONTOLOGY AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

HEALTH AND PHYSICAL EDUCATION College of Education

FACULTY

Ralph E. Stewart, chairperson, professor, EdD, University of Missouri-Columbia

John A. Roberts, director of graduate studies, professor, PhD, University of Iowa

Leon Johnson, professor, EdD, University of West Virginia

Paul C. Ritchie, EdD, University of Missouri-Columbia

James L. Ballinger, associate professor, EdD, University of Missouri-Columbia

James D. Brown, associate professor, PhD, University of Illinois

Benjamin R. Londeree, associate professor, EdD, University of Toledo

Parris R. Watts, assistant professor, HSD, University of Indiana

GRADUATE DEGREES OFFERED
MA, MEd or MAPE in health and physical education with the following emphasis areas: adapted physical education, administration of health and physical education: elementary school health and physical education, health education, human performance or secondary school health and physical education
EdD or PhD in health and physical education with the following emphasis areas: adapted physical education, administration of health and physical education, biomechanics, exercise physiology, health education or human performance

The Department of Health and Physical Education offers a variety of programs in areas of specialization at each graduate degree level. These programs are offered within the framework of each degree's requirements and are designed to provide flexibility according to the needs and interests of the individual candidate. These programs prepare graduates to teach health education or physical education at elementary, secondary, or higher levels of education, to perform and direct research in public and private institutions, to administer programs in physical education and athletics, and to administer physical fitness programs in industry or within private and community agencies.

See *Education* in this section for general information. Additional information may be obtained from the director of graduate studies, Department of Health and Physical Education, 113 McKee Gym.

HEALTH SERVICES MANAGEMENT School of Health Related Professions

FACULTY

Gordon D. Brown, director and professor, PhD, University of Iowa

Warren A. Thompson, professor, PhD, University of Missouri-Columbia

David A. West, professor, PhD, University of Arkansas
John K. Glenn, associate professor, PhD, University of Missouri-Columbia

Keith E. Boles, assistant professor, PhD, University of Arizona

Lanis L. Hicks, assistant professor, PhD, University of Missouri-Columbia

Gary Kraus, assistant professor, JD Washington University (St. Louis)

D. Patrick Morton, assistant professor, MPA, University of Colorado

Benjamin H. Rountree, assistant professor, DPA, University of Georgia

Kenneth D. Bopp, Lecturer, MA, Washington University

Gloria J. Deckard, Lecturer, MPA, University of Missouri-Kansas City

Harry Feirman, Lecturer, PhD, Penn State University

GRADUATE DEGREES OFFERED
MS in public health with an emphasis area in health services management
DUAL DEGREES OFFERED

MBA and MS in public health with a emphasis area in health services management

MPA/MS in public health with an emphasis area in health services management

MSIE/MS in public health with an emphasis area in health services management

The goal of the graduate program in health services management is to develop professionals with competencies that prepare them for leadership roles in the area of health administration. Students can elect a special concentration in hospital administration, health planning, long term care, ambulatory care, mental health administration, or international development. Initiated in 1965, the program currently accepts between 25 and 30 students starting in the fall semester. The program, a member of the Association of University Programs in Health Administration, awards the degree of master of science in public health and has been accredited since 1968 by the Accrediting Commission of Education for Health Services Administration.

MASTER'S DEGREE

The graduate program uses a number of academic areas within the University to provide a broad and rich academic base, and has formal dual degree options developed in three areas. The basic curriculum for the master's degree is designed for the individual with a general liberal arts background to provide the requisite knowledge and skills necessary to function effectively as a health care manager. By combining basic and advanced course work with an internal management study, externship and external management study, the student develops an area of expertise in one of the special concentration areas of the program. Actual course selection is a mutual decision between each student and his or her advisor. In all cases, the intent is to tailor the degree curriculum to each

individual student's needs as much as possible.

Students who have an undergraduate background in health administration, business administration, public administration or industrial engineering might choose to elect a formal dual degree option with business administration (MBA), public administration (MPA), or industrial engineering (MSIE). Under the dual degree option students are able to complete the requirements for both degrees in less time than if they pursued the degrees sequentially.

ACADEMIC PROGRAM

In the first year the graduate program develops the skills and conceptual and theoretical background necessary for students to analyze complex health system problems and to be innovative in their thinking. After completing the first two semesters of the academic program, students serve a three-month summer externship (under the guidance of a qualified preceptor) in an approved health care organization. This permits students to become familiar with the field, cognizant of some of the issues and problems in day-to-day operations and to apply some of the concepts and skills obtained during the first nine months in the classroom. Clinical and field experience facilities are provided by hospitals and other health organizations in Columbia, St. Louis, Kansas City and throughout the state and nation. During the summer externship students generally are paid a monthly stipend. The second year builds on the conceptual and theoretical base of the first year, providing increased flexibility to concentrate in various administrative and planning concentrations 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 health environment.

Following the second year, the student may elect to serve an administrative fellowship lasting from six months to one year. Students often take a fellowship to gain experience and broaden their orientation in large complex health institutions. If a student lacks previous work experience and wants an extended learning opportunity under a preceptor, he or she may elect or the faculty may recommend that a fellowship be served.

DEGREE REQUIREMENTS

The master's program in health services management is a full-time 63 hour sequence consisting of four semesters on campus plus a three-month summer externship in a hospital or other health facility. To graduate, a student must achieve a cumulative GPA of 3.0 (A = 4.0) or better in all graduate courses.

ADMISSION REQUIREMENTS

The University of Missouri-Columbia Health Services Management Program

recruits and accepts qualified applicants regardless of race, sex, age, physical ability, creed or national origin. To qualify for admission, an applicant must have earned a baccalaureate degree. The applicant should have maintained a cumulative 3.0 (A=4.0) GPA for the last 60 hours (two full academic years) of undergraduate and all graduate work completed and achieved an above-average score on any pre-entrance examinations.

Each applicant must submit recent scores from the Graduate Record Examination (exception: MS-MBA candidates may substitute Graduate Management Admission Test Scores for the GRE requirement). Applicants from countries where English is not the native language are required to submit test scores from Test of English as a foreign language. In all cases, above average test scores are sought.

Previous work experience in hospitals or other health facilities before admission is desirable. Students who intend to enter the program should, whenever possible, plan to work in a hospital or health-related organization during summer vacations.

For further information concerning the program, contact admissions coordinator, Health Services Management Program, 324 Clark Hall, UMC, Columbia, MO 65211, (314)882-6178.

HIGHER AND ADULT EDUCATION AND FOUNDATIONS

College of Education

FACULTY

Robert J. Dollar, professor, chairperson, director of graduate studies, EdD, Oklahoma State University
John W. Alspaugh, professor, EdD, University of Missouri-Columbia
Ralph C. Dobbs, professor, EdD, University of Indiana
Phyllis Drennan, professor, PhD, University of Iowa
Roger D. Harting, professor, EdD, University of Missouri-Columbia
Walter E. Hunter, professor, EdD, University of Colorado
Loren Jung, professor, PhD, Southern Illinois University, Carbondale
Christopher J. Lucas, professor, PhD, Ohio State University
John Christopher Reid, professor, PhD, University of Missouri-Columbia
Joseph L. Saupé, professor, EdD, University of Illinois
Nicholas A. Adams, associate professor, EdD, American University, Washington, D.C.
Irvin W. Cockriel, associate professor, EdD, University of Missouri-Columbia
Carolyn Dorsey, associate professor, PhD, New York University
Lonnie Echnacht, associate professor, EdD, University of Missouri-Columbia
Edmund A. Ford, associate professor, EdD, University of Missouri-Columbia
Gary C. Fox, associate professor, PhD, Michigan State University
Karl Blake Danuser, assistant professor, PhD, University of Missouri-Columbia
Ralph E. Glauert, assistant professor, PhD, University of Missouri-Columbia
Richard Oliver, assistant professor, PhD, University of Missouri-Columbia
Bonnie Zelenak, assistant professor, PhD, Kansas State University

GRADUATE DEGREES OFFERED HIGHER AND ADULT EDUCATION

MA or MEd in higher and adult education with the following emphasis areas: adult education administration, adult education teaching, higher education or junior college education

EdS in higher and adult education with the following emphasis areas: adult education, higher education or junior college education

EdD or PhD in higher and adult education with the following emphasis area: higher and adult education

SOCIAL AND PHILOSOPHICAL FOUNDATIONS

MA, MEd, EdD or PhD in social and philosophical foundations with the following emphasis areas: cultural foundations of education, educational policies and studies, or history and philosophy of education

The Department of Higher and Adult Education and Foundations provides graduate programs leading to careers in community college education, adult education, adult basic education, teaching and research (including the historical and cultural foundations of education), and several other areas of higher education and administration.

Providing courses for graduate and undergraduate students majoring in a variety of departments across the campus is a commitment of the department. Graduate students preparing to teach their discipline in a college or university setting often complete a support area of 12 semester hours in courses concerning college teaching, college administration, and the history and philosophy of higher education.

See *Education* in this section for general information. Additional information may be obtained from the director of graduate studies, Department of Higher and Adult Education and Foundations, 301 Hill Hall.

HISTORY

College of Arts and Sciences

FACULTY

N. Gerald Barrier, professor, chairperson, PhD, Duke University
Richard T. Bienvenu, professor, director of graduate studies, PhD, Harvard
Gerard H. Clarfield, professor, director of Undergraduate Studies, PhD, University of California-Berkeley
Thomas B. Alexander, professor, PhD, Vanderbilt University
Winfield J. Burggraaf, professor, PhD, University of New Mexico
Noble E. Cunningham Jr., professor, PhD, Duke University
Susan Flader, professor, PhD, Stanford University
Claudia Kren, professor, PhD, University of Wisconsin
John E. Lankford, professor, PhD, University of Wisconsin
Fordyce W. Mitchel, professor, PhD, Yale University
Charles G. Nauert Jr., professor, PhD, University of Illinois
Arvarh E. Strickland, professor, PhD, University of Illinois
Charles E. Timberlake, professor, PhD, University of Washington

Russell Zguta, professor, PhD, Pennsylvania State University
Lewis E. Atherton, professor emeritus, PhD, University of Missouri-Columbia
Charles F. Mullett, professor emeritus, PhD, Columbia University
Robert E. Ruigh, professor Emeritus, PhD, Harvard University
John L. Bullion, associate professor, PhD, University of Texas
Robert M. Collins, associate professor, PhD, Johns Hopkins
T. J. Jackson Lears, associate professor, PhD, Yale University
Kerby A. Miller, associate professor, PhD, University of California-Berkeley
Dina M. Copelman, assistant professor, PhD, Princeton University
Jonathan Sperber, assistant professor, PhD, University of Chicago

GRADUATE DEGREES OFFERED

MA in history

PhD in history

The Department of History offers graduate work leading to the master of arts and doctor of philosophy degrees. Lecture courses, seminars and directed research are available in the following fields of ancient, medieval and modern Europe; Russia; British History; South Asia; Latin America; and all aspects of American history. While students are expected to get specialized training in the fields of their choice, they are also urged to develop a broad historical background. Cooperation between other UMC departments and other campuses of the University allows students to design programs of interdisciplinary specialization.

The 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 Manuscripts Collection, a unique depository of material for regional studies in political, social and economic history.

The State Historical Society of Missouri has an outstanding library of primary and secondary works dealing with Missouri history. The program in American history has available the resources of the Truman Library at Independence, Mo.

The computing facilities on campus are available to graduate students for suitable projects.

The department provides qualified students the opportunity to gain college-level teaching experience by conducting discussion sections in American and European history. They earn \$5,250 per academic year and may carry up to 12 semester hours. Each appointment is subject to annual review and may be renewed.

The Graduate School offers a number of fellowships and scholarships. Interested students should apply to the dean of the Graduate School, 203 Jesse Hall.

A few appointments are available as graders for independent study courses in the UMC extension division. Compensation varies according to the time required.

Fellowship and assistantship application forms and additional information concerning financial aid or degree programs may be obtained by writing the director of graduate studies, 143 Arts and Science Building.

Applications for financial aid should be filed no later than February 1, but will be accepted until appointment decisions are made. Announcements of awards are made April 1.

MASTER'S DEGREE

An applicant for the MA should have an AB or a BS degree with a minimum of 18 upper-class hours of history and a GPA of 3.0 (A = 4.0). Students with a BS in education and a major in social studies should have 21 undergraduate hours in history. Students lacking the necessary hours may be required to take course work beyond the required 30 hours to remedy their deficiency.

In addition to the completed application and a transcript required by the Admissions Office, the department requires that each applicant send the director of graduate studies, Department of History, a short essay (no more than 500 words) explaining the applicant's intended fields of study, professional and vocational goals and other reasons for wishing to enter the graduate program. To strengthen the case for admission, an applicant may also wish to send to the director of graduate studies optional materials such as letters of recommendation from faculty members familiar with the student's work; a sample of formal written work (term paper, seminar paper or thesis); GRE Aptitude Test scores and/or scores on the GRE Advanced Achievement Test in History or scores on the Miller Analogies Test. The department reserves the right to evaluate the work presented and to determine each student's needs.

Early in the first term of residence at UMC, the director of graduate studies assigns each student an adviser, who assists in planning an MA degree program. Students must be in residence at UMC for a minimum of two semesters or three summer sessions. Not more than six semester hours of the required 30 hours of credit may be earned off campus by transfer, correspondence and extension courses or non-resident research. The completed MA program must have at least 30 semester hours of graduate credit, including at least 20 hours in history and at least 15 hours in courses numbered 400 and above. Not more than 12 semester hours may be taken in individual-directed work. At the end of the MA program, the candidate must pass an oral examination.

Students may elect either the non-thesis program (which must include at least two research seminars) or the the-

sis program (which requires six credit hours of thesis research in History 490 or in seminars, plus completion of an acceptable thesis). Students who elect the non-thesis MA are not allowed to continue for the PhD at UMC unless they write a thesis and have it approved by an examining committee before applying for the doctoral program. This thesis requirement does not apply to doctoral applicants whose MA degree is from another institution.

There is no foreign language requirement for the MA degree, but students who wish to go on for the PhD are urged to pass a reading comprehension examination in at least one foreign language during their first year of graduate work.

DOCTORAL DEGREE

Admissions procedures for students who have completed their MA degree elsewhere and who wish to become PhD candidates are identical to the departmental requirement for additional materials as outlined in the preceding section. Prospective PhD candidates are urged to submit as many of the optional materials as possible, especially letters of recommendation. The department strongly advises students not to attempt the PhD degree unless they received a grade of A (A = 4.0) in at least one-half of the courses on the master's program.

Early in the first semester of post-MA enrollment, prospective doctoral candidates should arrange with the director of graduate studies for a provisional advisory committee. This committee administers the oral qualifying examination during the first week of the student's second semester in residence. The examination focuses on the MA thesis and the thesis field or, in cases where the student has no MA thesis, on a seminar paper or other research paper plus the field in which that paper is written. Only after passing the qualifying examination will the student be admitted to candidacy for the PhD degree in history. For a student whose MA program was done at UMC, the final oral examination for the MA, based on the thesis and the thesis field, constitutes the qualifying examination; the student may proceed beyond the MA degree only upon the recommendation of the MA examining committee.

After completing the qualifying examination, a student, with the adviser's assistance, applies for degree candidacy and requests the appointment of an advisory committee. This committee, which is chaired by the adviser, certifies the passing of the qualifying examination and assists the candidate in planning a program of study. After completion of the study program, the student and adviser request appointment of the committee for the comprehensive examination. The examination, both written and oral, covers all areas of study offered for the PhD, including the dissertation field.

For a PhD in history, a candidate must offer a dissertation field, one area of

study in the same broad subdivision of history (Europe, United States, or Latin America and Asia) that encompasses the dissertation field, one area in another broad subdivision of history, and one area outside the department that complements the student's historical interests.

A candidate may choose a dissertation field from the following:

Greece, Rome, Medieval, Renaissance and Reformation, Early Modern Europe, Britain before 1688, Britain from 1688, Modern Europe (1789-present), France, Germany (1789-present), Kievan Rus', Moscovite and Imperial Russia (Peter the Great to the present), European Intellectual History, History of Science, American Colonial and Revolutionary (to 1787), the National Period (1787-1877), Recent United States (1877-present), The South, The West and Environmental History, Diplomatic History, Social History, Intellectual History, Afro-American History, Urban and Immigration History, India, Latin America.

Before admittance to the comprehensive examination, a candidate must meet the language and other research technique requirements. Mastery of one foreign language to a prescribed level of ability to translate into English is required. This mastery must be demonstrated by examination or, if approved by the candidate's advisory committee, by passing nine semester hours of college-level work with grades of C (A = 4.0) or better. The candidate must meet the remainder of the requirement in one of four ways: (1) demonstrate high proficiency in one language as verified by the respective language department, (2) demonstrate mastery of a second foreign language by examination, (3) pass nine semester hours of college-level work in a second language with grades of C (A = 4.0) or better, or (4) demonstrate mastery of an approved research technique (designed to contribute directly to the candidate's capacity to conduct research in history) either by examination or by approved graduate work.

The doctoral dissertation is written under the direction of the candidate's adviser, a qualified member of the history faculty at UMC or one of the University campuses. The final examination is oral and open to the public. It is both an examination on the field of and a defense of the dissertation.

HOME ECONOMICS

College of Home Economics

FACULTY

Beatrice B. Litherland, professor, dean, College of Home Economics, PhD, University of Minnesota
Sandra A. Helmick, associate professor, director of graduate studies, PhD, University of Missouri-Columbia

CHILD AND FAMILY DEVELOPMENT

Kathy Thornburg, professor, PhD, University of Missouri-Columbia
Marilyn Coleman, associate professor, EdD, University of Missouri-Columbia

David Imig, associate professor, PhD, Michigan State University

Jean Ispa, associate professor, PhD, Cornell University
George Wise, associate professor, PhD, University of Connecticut

Mary Gray, assistant professor, PhD, Michigan State University

Marion Typpo, assistant professor, PhD, University of Missouri-Columbia

CLOTHING AND TEXTILES

Kitty Dickerson, associate professor, PhD, St. Louis University

Betty Feather, associate professor, PhD, University of Missouri-Columbia

Josephine M. Holik, associate professor, MA, Virginia Polytechnic Institute

FAMILY ECONOMICS AND MANAGEMENT

Edward J. Metzzen, professor, EdD, University of Missouri-Columbia

Marilyn Caselman, associate professor, MS, Ohio State University

Sandra A Helmick, associate professor, PhD, University of Missouri-Columbia

Anna Cathryn Yost, associate professor, MS, Purdue University

Melchior J. Zelenak, assistant professor, PhD, Iowa University

HOME ECONOMICS COMMUNICATIONS

Martha Jo Martin, assistant professor, EdD, University of Missouri-Columbia

HOME ECONOMICS EDUCATION

Betty Martin, assistant professor, PhD, University of Missouri-Columbia

Joan Quilling, assistant professor, PhD, Michigan State University

HOUSING AND INTERIOR DESIGN

Robert Kabak, professor, MFA, Yale University
C. Bud Kaufmann, professor, PhD, Florida State University

Richard Helmick, associate professor, MFA, Ohio State University

Gary L. Hennigh, associate professor, MFA, Colorado University

Ruth Brent, assistant professor, PhD, University of Minnesota

HUMAN NUTRITION, FOODS AND FOOD SYSTEMS MANAGEMENT

Helen Anderson, professor, PhD, University of Wisconsin

Margaret Flynn, professor, PhD, University of Missouri-Columbia

Loretta Hoover, professor, PhD, University of Missouri-Columbia

Byrdine Tuthill, professor, MS, University of Wisconsin

John Typpo, professor, PhD, University of Minnesota

Richard Dowdy, associate professor, PhD, North Carolina State University

Gabriella Molnar, associate professor, PhD, Vanderbilt University

Karen Morgan, associate professor, PhD, University of Missouri-Columbia

James Nordstrom, associate professor, PhD, University of Minnesota

Donna Curtis, assistant professor, PhD, University of California-Berkeley

Karla Hughes, assistant professor, PhD, University of Tennessee

Kenneth Prusa, assistant professor, PhD, Kansas State University

GRADUATE DEGREES OFFERED

MA and MS in home economics communications

MA and MS in child and family development

PhD in home economics with an emphasis area in child and family development

MA and MS in clothing and textiles

PhD in home economics with an emphasis area in clothing and textiles

MA and MS in family economics and management

PhD in home economics with an emphasis area in family economics and management

MA and MS in housing and interior design

PhD in home economics with an emphasis area in housing and interior design

MA and MS in human nutrition, foods and food systems management

PhD in home economics with an emphasis area in human nutrition, foods and food systems management

The College of Home Economics offers graduate study in various disciplines within the college. The degrees offered are the doctor of philosophy, the master of arts or master of science, depending on the nature of the program.

Programs emphasize the interrelationships of human factors with the socio-economic environment and the food, clothing and shelter aspects of the physical environment.

Master's degree programs are planned individually to meet the needs and objectives of students. Subject areas which may serve, singly or in combination, as a focus for the master's program include child and family development, food, nutrition, food systems management, clothing, textiles, housing, interior design, family and consumer economics and home economics communication. Students with these master's degrees are in demand for positions in extension, government service, business, teaching and research.

Master's degrees with emphases in the listed areas of home economics are also offered through extension education in the College of

Agriculture and through home economics education in the College of Education.

The PhD program is designed to prepare students for research, college teaching or other advanced professional careers requiring a high degree of understanding and competence. The PhD program in home economics is planned individually to focus upon a specific area: child and family development, clothing and textiles, family and consumer economics, housing, interior design, nutrition or food systems management.

Laboratory and work space is available for graduate study and research in Gwynn and Stanley Halls and in the Home Management Center. Special facilities include nutrition laboratories for animal and human studies, humidity- and temperature-controlled areas for textile research and three child development study laboratories. Costume and fabric collections are housed in Stanley Hall. Visual records of Missouri costume are available for use by graduate students. Graduate students have access to microcomputers in the college for purposes of manuscript preparation, access to the mainframe computer, or computer-aided design. The

Department of Housing and Interior Design maintains two resource areas: a resources library and a resource studio. These contain catalogs, samples, microcomputers and design equipment to provide linkage between industry and education. The health sciences center, the experiment station laboratories, the whole-body counter and research reactor facilities provide additional opportunities for study. Students in food and nutrition make considerable use of the Health Sciences Library. Those planning historical studies use documents of the State Historical Society of Missouri.

Research opportunities and facilities in the college are extended by cooperation with other schools and divisions on campus. The College of Education, through the coordinator of home economics education, provides opportunities for certification of specialization in addition to subject-matter degrees. The director of the UMC Hospital & Clinics Department of Nutrition and Dietetics and other members of that staff are professional members of the College of Home Economics faculty.

The state staff in home economics extension, who are faculty members of the college, work closely with the teaching and research staff in providing graduate students with opportunities for research and experience in both rural and urban areas. The college also participates in the Missouri Agricultural Experiment Station research projects and data banks from other research provide a basis for analyses for theses and dissertations. Excellent computer facilities and research consultation are available.

Teaching and research assistantships and some opportunities for part-time work, are available to qualified students at both the master's and PhD levels. Teaching assistantships provide supervised experience in college teaching activities. Applications should be submitted before April 1 of each year, although inquiries may be made at any time. Information also is available on national fellowships. For application forms, write the associate dean for research and graduate studies, College of Home Economics.

MASTER'S DEGREES

Requirements for admission to the master's program are: (1) a 3.0 (A = 4.0) GPA for the last 60 hours from an accredited college (applicants with slightly lower GPAs may ask for a review of their credentials to determine potential for success; consideration is given to aptitude, motivation and performance in the student's major area); and (2) acceptable performance on the GRE (Part 1). Applicants to the Department of Housing and Interior Design are required to present a portfolio for review.

Upon acceptance of the student into the program, the adviser or advisory committee determines what undergraduate

courses, if any, are required to provide a sound basis for graduate study. The study program includes courses needed to update the student's knowledge and those required to attain master's-level competency in a subject area.

The minimum course requirements are 30 hours of graduate-level courses, including at least 15 hours in courses numbered 400 or higher. Not more than 12 hours of the 30 may be in problems, readings, research and other independent study. To complete the degree requirements, a written and/or oral examination is required.

Each student must successfully complete an independent study project. A student normally enrolls for six to eight hours in thesis research (490) or four to six hours in non-thesis research (450). Non-thesis research may lead to a paper, publication or other evidence of successful completion of the research. For instance, a student in interior design might do a restoration study on a historic Missouri home, with renderings of the restoration and documentation.

DOCTORAL DEGREE

Requirements for admission to the doctoral program are (1) a GPA of 3.0 (A = 4.0) or higher in previous graduate work, as reflected in approximately 30 hours of graduate-level courses; and (2) acceptable performance on the GRE (Part 1). Applicants desiring emphasis in housing and interior design are required to present a portfolio for review.

Approval to begin work on a PhD program depends upon the student's qualifications and the availability of the faculty and facilities. Consideration also is given to grades in the major area of interest, and to maturity, experience, motivation and other factors which indicate Potential for success in the program. Graduate aptitude test scores should indicate ability at the PhD level and an aptitude for the area of study.

A written and/or oral qualifying examination, administered by the student's advisory committee, must be completed satisfactorily before admission to the PhD study program. Students' recently completing master's degrees may request that the master's degree be considered a qualifying examination.

The student and adviser develop a preliminary program plan (taking into account specific background, strengths, weaknesses and objectives) which serves as the basis of the final program to be approved by the advisory committee. Courses must be completed with an average grade of B (3.0).

A student becomes an official candidate for the PhD degree after successfully completing the course work and passing the written and oral comprehensive examination. A written dissertation based on original research and an oral examination defending the dissertation must be completed.

HOME ECONOMICS COMMUNICATIONS College of Home Economics

FACULTY

Martha Jo Martin, assistant professor, EdD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED MA and MS in home economics communication

The College of Home Economics offers graduate study leading to the degree of master of arts and master of science in home economics communications. The degrees prepare students for positions in communications—newspapers, radio, television, advertising, magazines, public relations—where a background in home economics is helpful or essential. Home economics courses may be selected from one of the five departments or a combination of all five: Child and Family Development, Clothing and Textiles, Family Economics and Management, Housing and Interior Design, or Human Nutrition, Foods and Food Systems Management.

Positions may be found in business, government, educational institutions as well as the media.

See *Home Economics* in this section for general information. Additional information may be obtained from the chairperson, Department of Home Economics Communications, 1-98 Agriculture Building.

HORTICULTURE College of Agriculture

FACULTY

Ray R. Rothenberger, professor, chairperson, PhD, University of Missouri-Columbia

Marlin N. Rogers, professor, director or graduate studies, PhD, Cornell University

John H. Dunn, professor, PhD, Rutgers University-New Brunswick

Arthur E. Gaus, professor, PhD, University of Missouri-Columbia

Victor N. Lambeth, professor, PhD, University of Missouri-Columbia

Ronald E. Taven, professor, MS, University of Minnesota of Minneapolis St. Paul

Delbert D. Hemphill, professor Emeritus, PhD, University of Missouri-Columbia

Raymond A. Schroeder, professor Emeritus, PhD, University of Missouri-Columbia

Gary G. Long, associate professor, PhD, Michigan State University-East Lansing

Nicholas J. Natarella, associate professor, PhD, Michigan State University-East Lansing

Leon C. Snyder, Jr., associate professor, M.L.A., University of Michigan Ann Arbor

David D. Minner, assistant professor, PhD, Colorado State University

Chris J. Starbuck, assistant professor, PhD, Oregon State University

David H. Trinklein, assistant professor, PhD, University of Missouri-Columbia

Michele R. Warmund, assistant professor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MS in horticulture

PhD in horticulture

The Department of Horticulture offers graduate work leading to the master of science and doctor of philosophy degrees. Opportunities for graduate study are available in floriculture, fruit science, orna-

mental horticulture, turf, vegetables and weed science, with emphasis on physiology and plant breeding. The MS program prepares students for research, teaching and advanced professional careers.

Well-equipped laboratories, plant growth chambers and environment-controlled greenhouses, and excellent outdoor laboratories and facilities are available to the student for biochemical, genetic, morphological and physiological studies in horticultural science.

Fellowships, scholarships and teaching and research assistantships are available to qualified graduate students. Write the director of graduate studies for additional information.

MASTER'S DEGREE

MS with thesis. A student must have satisfactorily completed all courses in basic science and horticulture required for certification for graduation with BS in horticulture. Students not meeting the minimum hour requirement may enroll as a nondegree candidate until the requirement is met.

All students are required to take a qualifying examination to determine their proficiency in horticulture and science subjects and to guide the formulation of the study program. Additional university credits in these areas may be required if the examination indicates such need. Under the guidance of an advisor and the department chair, a course of study is designed to fit each student's academic background, experience and objectives. A student must complete a minimum of 30 semester hours of graduate work, including at least 15 hours numbered 400 or higher. There is no language requirement for the master's degree.

A thesis is required of all candidates. A candidate must fulfill the approved course of study with a grade of B (3.0) or better and pass a written and/or oral examination upon completion of course work and a thesis.

MS without thesis. A program leading to the MS degree without thesis, but having the same basic requirements as above, is also available to students who would benefit more by taking additional course work rather than by completing a research project which normally culminates in the preparation of a thesis. This program is primarily for students preparing for positions in horticultural extension, teaching in vocationally-oriented programs or others who already have a BS degree, but who find a postgraduate degree without a thesis especially fitted to their needs. Up to five hours credit toward this degree could consist of Horticulture 450 Non-Thesis Research. This is a terminal program and not an intermediate step toward the research-oriented PhD program.

DOCTORAL DEGREE

To be admitted to candidacy for a PhD the student must (1) demonstrate competency by a written and/or oral qualifying

examination conducted by the advisory committee, composed of at least five members appointed by the dean of the Graduate School, and (2) complete a program of study approved by the advisory committee.

The advisory committee determines the language requirement, if any, and approves the research problem for the dissertation.

HOUSING AND INTERIOR DESIGN

College of Home Economics

FACULTY

Ruth Brent, assistant professor, acting chairperson, PhD, University of Minnesota

Robert Kabak, professor, MFA, Yale University

C. Bud Kaufmann, professor, PhD, Florida State University

Gary L. Hennigh, associate professor, MFA, University of Colorado

Richard Helmick, associate professor, MFA, Ohio State University

GRADUATE DEGREES OFFERED

MA and MS in housing and interior design

PhD in home economics with emphasis area in housing and interior design

The housing and interior design department offers graduate study leading to the master of arts and the master of science in housing and interior design, and the doctor of philosophy in home economics with emphasis in housing and interior design. These advanced degrees prepare the student for careers in environmental design research, higher education in design and allied fields, consulting, government and professional design administration. For example, areas of study include (but are not limited to) facility planning, environment and behavior, and historical preservation studies with application to improving the quality of life.

See *Home Economics* in this section for general information. Additional information may be obtained from the chairperson, Department of Housing and Interior Design, 137 Stanley Hall.

HUMAN NUTRITION, FOODS AND FOOD SYSTEMS MANAGEMENT

College of Home Economics

FACULTY

Richard Dowdy, chairperson, associate professor, PhD, North Carolina State University

Helen Anderson, director or graduate studies, professor, PhD, University of Wisconsin

Margaret Flynn, professor, PhD, University of Missouri-Columbia

Loretta Hoover, professor, PhD, University of Missouri-Columbia

Byrdine Tuthill, professor, MS, University of Wisconsin

John Typpo, professor, PhD, University of Minnesota

Gabriella Molnar, associate professor, PhD, Vanderbilt University

Karen Morgan, associate professor, PhD, University of Missouri-Columbia

James Nordstorm, associate professor, PhD, University of Minnesota

Donna Curtis, assistant professor, PhD, University of California-Berkeley

Karla Hughes, assistant professor, PhD, University of Tennessee

Kenneth Prusa, assistant professor, PhD, Kansas State University

GRADUATE DEGREES OFFERED

MA and MS in human nutrition, foods and food systems management

PhD in home economics with an emphasis area in human nutrition, foods and food systems management

The Department of Human Nutrition, Foods and Food Systems Management offers graduate study leading to the degrees of master of science, master of arts and doctor of philosophy in home economics with emphasis in human nutrition, foods and food systems management. The MS and MA degrees may specialize in human nutrition, foods research, food systems management, human nutrition and foods. Those students selecting the PhD degree may specialize in human nutrition or food systems management.

The MS and MA degrees prepare students for positions in community, junior college, or college teaching, in supportive roles in academia or industry, in leadership roles in dietetics, in Extension, in food production and quality control, in government or service sponsored nutrition assistance agencies, or in the private practice of dietetics. The PhD degree can lead to research, to college or university teaching, to research direction in industry, government, academia or other institutions, or to administrative positions related to foods, nutrition, or food service management.

See *Home Economics* in this section for general information. Additional information may be obtained from the chairperson, Department of Human Nutrition, Foods and Food Systems Management, 217 Gwynn Hall.

INDUSTRIAL ENGINEERING

College of Engineering

FACULTY

Michael S. Leonard, professor and interim chairperson, director of graduate studies-Columbia, PhD, University of Florida

Owen W. Miller, professor, director or graduate studies-Kansas City, DSc, Washington University (St. Louis)

Larry G. David, professor, director of undergraduate studies, PhD, Purdue University

Robert M. Eastman, professor, PhD, Pennsylvania State University

C. Alec Chang, assistant professor, PhD, Mississippi State University

Antonio J. Dieck, assistant professor, PhD, Georgia Institute of Technology

Cerry M. Klein, assistant professor, PhD, Purdue University

Senecer Yeralan, assistant professor, PhD, University of Florida

GRADUATE DEGREES OFFERED

MS in industrial engineering

PhD in industrial engineering

COOPERATIVE DUAL DEGREES

MBA/MS in industrial engineering

MS in industrial engineering/MS in public health with an emphasis area in health service management

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 systems design problems. Many of these systems are required to operate within increasingly complex constraints, thus necessitating 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. In industrial engineering, the master of science program is designed to provide a basic understanding of these tools, as well as 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 in the General Graduate School section under PROFESSIONAL ENGINEERING REGISTRATION.

Admission to the department's graduate programs is available to students with a baccalaureate degree from an accredited undergraduate curriculum in engineering, mathematics, statistics, or physical science, whose record indicates the ability to complete the program successfully. Students with other undergraduate degrees may be accepted after completing appropriate prerequisite course work. Several factors are considered in evaluating an applicant's capability, such as over-all grade point average, grade trends and major area grades. In addition, each applicant is required to take the general aptitude portion of the GRE.

In support of the academic program, laboratory facilities in several major application areas are available both within the department and in other departments with related interests. Neighboring industries; city, county and state government agencies; the UMC health sciences center; the Truman Veterans Hospital; the UMC health services research center; local hospitals; and nearby large metropolitan centers provide an unlimited reservoir for research and design opportunities.

The department has terminal access to the UMC computing network and the College of Engineering Computer Network. The department also maintains its own microcomputers for student use. In addition to Ellis Library facilities, an excellent collection of mathematical, statistical and engineering books and reference materials are housed in the Engineering Library.

Fellowships, scholarships and teaching and research assistantships are available to qualified graduate students. These forms of financial assistance are support-

ed by funds made available through state, federal and industrial graduate support programs, as well as research grants from various industrial and governmental agencies.

For additional information, applications for admission and financial aid, and other catalogs, write the director of graduate studies, Department of Industrial Engineering, UMC, Columbia, Mo. 65211, or call 314/882-2691.

MASTER'S DEGREE, THESIS AND NON-THESIS OPTIONS

There are two basic programs leading to the MS degree: (1) a 30-credit-hour research-oriented program requiring a thesis; (2) a 30-credit-hour design-oriented program requiring a design project. There is no language requirement in either program.

The master's curriculum is built upon a four-course core common to all master's candidates and a four-course concentration around which the student can mold his or her overall academic effort. It covers application of probability and statistics to engineering and systems analysis problems, the interface between industrial engineering and the management function, and fundamentals underlying decision-making processes.

In general, students are accepted for advisement in the MS program if their under-graduate GPA is at least 3.0 on a 4.0 scale, and if they have an acceptable score on the general aptitude portion of the GRE. Students who do not satisfy the above minimal requirements, but believe unusual circumstances qualify them to do graduate work in industrial engineering, may apply for admission. A letter explaining the nature of these circumstances should be submitted to the director of graduate studies. The departmental graduate faculty reviews such petitions on an individual basis.

DUAL MS DEGREE PROGRAMS

The Department of Industrial Engineering in cooperation with the College of Business and Public Administration, offers a dual MS 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.

The Department of Industrial Engineering, in cooperation with the health services management program of the School of Medicine, offers a dual MS 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 together 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 public health program, and the required courses in the public health program are used as electives in the industrial engineering program. As a result, it is possible for the student to earn an MS in public health and an MS in industrial engineering simultaneously.

DOCTORAL DEGREE

PhD degree programs are individually tailored to satisfy students' objectives. However, the MS core courses also form a common core for all PhD programs, which culminate in an original research dissertation.

Admission to the PhD program is granted only to highly qualified students. While many earn an MS degree before pursuing a PhD program it is not prerequisite to admission.

In addition to the traditional areas of industrial engineering research, the department offers a PhD program in health care systems design, developed through training grants from the National Center for Health Services Research and the Veterans Administration. The basic goals of this program are to provide students with the latest tools and techniques of systems analysis and design, an in-depth understanding of medical care and the organization of health care delivery systems, an extensive experience in health care systems design, and research experience in the development of new tools or unique applications of existing technology to the design or analysis of health care systems.

INTERNATIONAL DEVELOPMENT AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

JOURNALISM School of Journalism

FACULTY

Donald J. Brenner, professor, associate dean for graduate studies and research, PhD, University of Missouri-Columbia

George Kennedy, associate dean, news-editorial, PhD, University of Missouri-Columbia

Daryl R. Moen, professor, chairperson, editorial, MA, University of Minnesota

Won Chang, professor, PhD, University of Iowa

W. David Dugan Jr., professor, MS, St. Bonaventure University

Paul L. Fisher Jr., professor, PhD, University of Missouri-Columbia

Roy M. Fisher, professor, BS, Kansas State University

Roger A. Gafke, professor, associate dean, AM, University of Missouri-Columbia

Rod Gelatt, professor, AM, University of Iowa

Robert P. Knight, professor, PhD, University of Missouri-Columbia

Ernest Cecil Morgan, professor, PhD, University of Texas

Joye Patterson, professor, PhD, University of Missouri-Columbia

Donald P. Ranly, professor, PhD, University of Missouri-Columbia

Keith P. Sanders, professor, PhD, University of Iowa

Dale R. Spencer, professor, JD, University of Missouri-Columbia

Brian S. Brooks, associate professor, AM, University of Missouri-Columbia

Phillips Brooks, associate professor, AM, University of Missouri-Columbia

Harold Lister, associate professor, AM, University of Missouri-Columbia

Robert L. Terrell, associate professor, PhD, University of California-Berkeley

Steve Weinberg, associate professor, AM, University of Missouri-Columbia

Karen List, assistant professor, PhD, University of Wisconsin-Madison

GRADUATE DEGREES OFFERED

MA in journalism

PhD in journalism

The School of Journalism offers graduate work leading to the master of arts and the doctor of philosophy degrees. Graduate students do not choose a major; rather, they indicate a primary interest in journalism such as advertising, news-editorial, magazine, photojournalism, international journalism, etc., and choose the program that best suits their backgrounds and career objectives.

The student can choose between two programs of study for the master of arts degree. The choice of program depends on the student's background, career objectives and personal choice.

The choice of programs should be made only after students have carefully assessed their professional objectives and have sought the advice of a potential faculty advisor. For some students, particularly those with an undergraduate degree in journalism, a thesis option is the better approach. For others, particularly those who wish to develop a specialized competence (science writing, for example), the non-thesis option is better.

For either research or professional aims, the School of Journalism has special facilities. Among them are:

The building complex. Four buildings are equipped with computer typesetting, photography labs, an advertising research laboratory, a computer center, the Graduate Studies Center and full-leased wire services from the Associated Press, United Press International and the New York Times Service.

The Columbia Missourian, a daily-Sunday teaching newspaper of general circulation, provides professional training under faculty supervision.

Radio and TV stations. KOMU-TV, an affiliate of ABC, functions as a teaching television station, and radio station KBIA-FM provides training in radio news work.

Three major libraries. Ellis library with an excellent collection of newspapers and magazines; the Journalism Library with more than 20,000 volumes, plus hundreds of magazines and newspapers received regularly; and the State Histori-

cal Society of Missouri Library with its extensive file of Missouri newspapers dating from the first in 1808 are all available for research use.

The Freedom of Information Center maintains a day-to-day study of the more notable actions by government, media and society affecting the movement of information. The center supports itself through sustaining memberships of newspapers and broadcasting stations, from annual subscriptions to its monthly report series and bimonthly newsletter and from sales of publications.

In addition, the school works with international, national and state media associations, and each spring it sponsors Journalism Week, which brings contemporary leaders in mass communications to the campus. There also are regular workshops for photojournalists, and college and high school publications advisors and staff members. For graduate students, a continuous year-round program is available through summer sessions and intersessions.

Several fellowships and assistantships and other opportunities for financial aid are available. For details write to the director of graduate studies.

MASTER'S DEGREE, THESIS AND NON-THESIS OPTIONS

To be admitted to the Graduate School, an applicant is required to have an undergraduate GPA of at least 3.0/4.0 or equivalent during the last two years of undergraduate work. Part I of the Graduate Record Examination is required. Transcripts are reviewed by the School of Journalism Graduate Studies Committee.

A student must complete undergraduate courses in news and editing or their equivalent as determined by the admissions subcommittee.

Students who verify professional experience may be excused from one or both of these requirements. All students must successfully complete at least one graduate-level course in reporting and one such course in editing.

In addition, students electing the thesis option must:

- (1) complete 36 semester hours of graduate work, at least half of it in courses numbered 400 or higher;
- (2) complete the following courses for graduate credit: 320, Dynamics of Advertising or 386, Economics of the Media; and 390, History of Mass Media.,
- (3) complete the following graduate courses: 422, Mass Media Seminar; 488, Research Methods in Journalism; 491, Graduate Assembly; and 490 Research. The product of the research course should be a thesis showing capacity for investigation and independent thought.

In addition, non-thesis students must:

- (1) complete 36 hours of graduate work, including at least 18 hours numbered 400 or higher;
- (2) complete the following courses for graduate credit; 320, Dynamics of

Advertising or 386, Economics of the Media; and 390, History of Mass Media;

- (3) complete the following graduate courses: 422, Mass Media Seminar; 487, Journalism as Communication, or 488, Research Methods in Journalism; 491, Graduate Assembly; 495, Area Seminar; and 499, Area Problems. The product of the area problem course should demonstrate a professional level of competency in a designated area of journalism.

The area problem may be completed in Columbia or in one of these off-campus programs:

- (a) MA candidates whose primary interest is in the reporting of public affairs may demonstrate professional competency in a program of depth reporting in Washington, D.C., under the supervision of a full-time faculty member of the School of Journalism. The program is directed from a facility in the National Press Club Building. Students who qualify for the reporting of public affairs programs in Washington need strong foundations in American and world history, in economics and in political science. They report in depth on legislative, executive and administrative aspects of the national government during their final semester.
- (b) Graduate students who wish to demonstrate professional competence in reporting may enroll in a program directed by a faculty member of the School of Journalism in London, England. In order to be considered for the London program, students need a strong background in economics because they will be reporting and interpreting the activities of such organizations as the Common Market and NATO.
- (c) Science, environmental and medical reporting projects currently are available in New York. Special preparation prior to enrollment in these programs is advised.
- (d) Off-campus reporting programs accommodating small numbers of students are also available by special arrangement in Hong Kong, Republic of China (Taiwan), People's Republic of China (Beijing), Japan, Korea, and Israel.
- (e) Students interested in special coverage of state government and related agencies are supervised by a faculty member in Jefferson City, Mo.

Projects in advertising, broadcasting, public relations, readership investigations, media management, photojournalism, newspaper and magazine origination have met all non-thesis option requirements.

Both thesis and non-thesis candidates must pass a written comprehensive examination. In addition, the thesis candidate must pass an oral examination justifying the thesis as a work acceptable by the Graduate School. A non-thesis candidate must pass an oral examination justifying the project as a work acceptable by the Graduate School and must provide the Graduate Studies Center with a detailed report of the project.

FOREIGN STUDENTS

MASTER'S DEGREE

Foreign students who wish to study the philosophy and methodology of American journalism without mastering the specific skills and techniques required of English-speaking students may follow a special curriculum for a master's degree, as prescribed by the Foreign Students' Master's Degree Coordinating Committee. They may take 36 hours including a thesis, or 40 hours with no thesis.

Students in this special program must take 104, News Practicum (s/u); 402, Theory of Mass Communication; 404, Theory of International Communications; 422, Mass Media Seminar; and 488, Research Methods in Journalism.

Each candidate is responsible for satisfying all residence and grade requirements, time limitations and other matters specified in this catalog and by the School of Journalism Graduate Studies Committee.

DOCTORAL DEGREE

The main objective of doctoral study in journalism is to develop facility in advanced research and to integrate this skill and orientation with a depth of general scholarship in mass communications. Students must expand intellectual horizons, gain a theoretical framework for understanding communication and refine the ability to communicate effectively.

The student must specialize or concentrate in three rather broad academic areas, two of them related to journalism (for example, international journalism, and mass communications research and theory), and the other related to one academic field outside journalism (for example, sociology).

PhD candidates must submit an acceptable dissertation, pass all prescribed examinations and satisfactorily meet all other requirements of the Graduate School.

During the first semester of graduate study beyond the master's degree (or its equivalent), the doctoral student should consult with area specialists to discover research opportunities. Although no minimum number of credit hours is specified for the PhD in journalism, from 50 to 65 hours beyond the master's degree is common. The only journalism graduate courses required of all PhD candidates are 422, Mass Media Seminar, 488; Research Methods in Journalism; and 489, Advanced Research Methods.

The student is admitted to candidacy for the PhD in journalism after passing a qualifying examination, which should be taken before pre-registration for the

second semester or term on campus. The PhD candidate must have a 3.5 grade point average, high GRE scores and two years of professional experience.

The residence requirement can be satisfied by either two 12-hour semesters or three 8-hour semesters within an 18 month period. This is exclusive of work taken to substitute for one foreign language.

To satisfy the language requirement, the candidate may take the regular examinations in two foreign languages; or may take a block of courses in a collateral field, such as statistics, in lieu of one language; or may evidence fluency in reading, speaking and writing in only one language.

Toward the end of the program, the student takes the comprehensive examination, administered by the advisory committee. Questions are given in two areas or "emphases" of journalism and in one area outside journalism which the student has chosen. This examination must be completed at least seven months before the final oral examination.

The dissertation is expected to be a contribution to knowledge in the general field of communication. It is read and appraised by at least three members of the Journalism faculty and by at least one member of the UMC faculty outside journalism, all of whom are on the student's committee. Following committee approval of the dissertation, the final oral examination, given primarily on the dissertation, is conducted.

LABORATORY ANIMAL MEDICINE

Information on this program is detailed in the FIELD OF STUDY section immediately preceding the section on AREA PROGRAMS in this catalog.

LIBRARY AND INFORMATIONAL SCIENCE

FACULTY

- Mary F. Lenox**, associate professor, dean, EdD, University of Massachusetts
Francis J. Flood, associate professor, director of graduate studies, chairperson, library science, AMLS, University of Michigan
Thomas R. Kochtanek, assistant professor, chairperson, information science, PhD, Case Western Reserve
C. Edward Carroll, professor, PhD, University of California
Donald R. Shurtleff, professor, PhD, Worcester Polytechnic Institute
Hellmut Lehmann-Haupt, professor emeritus, PhD, University of Frankfurt
Ralph H. Parker, professor emeritus, PhD, University of Texas
Robert A. Berk, associate professor, PhD, University of Illinois
Roy W. Evans, associate professor, PhD, Southern Illinois University
Ronald L. Fingerson, associate professor, PhD, Kansas State University

GRADUATE DEGREE OFFERED

MA in library science

The School of Library and Informational Science offers graduate work and supervised experience leading to the degree of master of arts in library science.

Specialization is possible in academic, public, school and special (including medical) libraries; in information science, reference work, cataloging, children's and adult services; and in archive administration.

The UMC Ellis Library, with its extensive collections in many subject areas, offers support to the teaching and research program in library science and in information science. The library's computerized record system is especially significant for teaching newer facets of librarianship. In addition, there are excellent libraries in the vicinity available for observation or for work experience.

A number of assistantships, limited to candidates for the MA in library science, are available for half-time employment in Ellis Library. There are several graduate teaching assistantships in the school.

Only students whose academic records indicate probability of successful completion of the master's program are accepted for advisement. In general, a GPA of 3.0 (A=4.0) on the last two years of undergraduate work, plus a satisfactory score on the Miller Analogies Test, are required. Persons whose undergraduate GPA is below 3.0 may be considered for admission, provided they have outstanding scores on aptitude tests. Under unusual circumstances, the GRE may be substituted for the Miller Analogies Test, but permission to make the substitution must be obtained from the dean of the School of Library and Informational Science.

The course of study requires completion of at least 36 hours graduate credit, of which at least 15 will have to be numbered 400 or above, and at least 18 must be taken on campus after acceptance for advisement. These 36 semester hours must include the following courses: Library Science, 312 Cataloging and Classification (3 hours); 332 Bibliography and Reference (3 Hours); 326 Developing Library Collections (2 Hours); 341 Management of Information Agencies (3 hours); 450 Research (3 hours); and Information Science, 401 Library Information Systems (5 hours).

To fulfill requirements for the degree students must pass a comprehensive examination administered by the faculty of the School of Library and Informational Science. This examination may be either written or oral as decided by the departmental Committee on Examinations.

LINGUISTICS

AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

MANAGEMENT

College of Business and Public Administration

FACULTY

E. Allen Slusher, professor, chairperson, PhD, University of Iowa

The Departments of Management, Finance and Marketing in the School of Business jointly offer the master of business administration and the doctor of philosophy in business administration interdisciplinary degrees. Program information and requirements are given under the area heading Business Administration in this catalog.

MARKETING

College of Business and Public Administration

FACULTY

Donald L. Shawver, professor, chairperson, PhD, University of Illinois

The Departments of Marketing, Finance and Management in the School of Business jointly offer the master of business administration and the doctor of philosophy in Business Administration interdisciplinary degrees. Program information and requirements are given under the area heading BUSINESS ADMINISTRATION in this catalog.

MATHEMATICS

College of Arts and Sciences

FACULTY

- E. Dennis Sentilles**, professor, chairperson, PhD, Louisiana State University
Nigel J. Kalton, professor, director of graduate studies, PhD, Cambridge University
Calvin D. Ahlbrandt, professor, PhD, University of Oklahoma
John K. Beem, professor, PhD, University of Southern California
Paul E. Ehrlich, professor, PhD, SUNY-Stony Brook
James A. Huckaba, professor, PhD, University of Iowa
Marc Q. Jacobs, professor, PhD, University of Oklahoma
L. Jerome Lange, professor, PhD, University of Colorado
Clinton M. Petty, professor, PhD, University of Southern California
Keith W. Schrader, professor, PhD, University of Nebraska
W. Roy Utz, professor, PhD, University of Virginia
Joseph L. Zemmer, professor, PhD, University of Wisconsin
Robert P. Carmignani, associate professor, PhD, Rice University
Peter G. Cassaza, associate professor, PhD, University of Iowa
Carmen C. Chicone, associate professor, PhD, University of Wisconsin
Joseph G. Conlon, associate professor, PhD, Oxford University
Richard M. Crownover, associate professor, PhD, Louisiana State University
Ira J. Papick, associate professor, PhD, Rutgers University
Dix H. Pettey, associate professor, PhD, University of Utah
John H. Reeder, associate professor, PhD, Northwestern University
Elias Saab, associate professor, PhD, University of Illinois, Champaign-Urbana
Mark S. Ashbaugh, assistant professor, PhD, Princeton University

Richard Fedder, assistant professor, PhD, University of Michigan
Juergen Gerlach, assistant professor, PhD, Oregon State University
Daniel C. Offin, assistant professor, PhD, University of Calgary
Paulette Saab, assistant professor, PhD, University of Illinois, Champaign-Urbana

GRADUATE DEGREES OFFERED

MS in Applied Mathematics

MA in Mathematics

MST in Mathematics

PhD in Mathematics

INTERDISCIPLINARY AREA PROGRAM

MS in Physical Science

The Department of Mathematics offers graduate work leading to the degrees master of arts, master of science for teachers, master of science in applied mathematics and doctor of philosophy.

Before being accepted as candidates for an advanced degree in mathematics, applicants must first be admitted to the Graduate School. Their undergraduate mathematics courses and grades are then evaluated by the department. 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 prepare them for graduate work.

About 35 graduate students, of whom 12 are post-master's, are currently in the department; most are supported by graduate teaching assistantships. Students considered eligible for fellowships may be asked to submit more detailed information about their qualifications.

MASTER OF ARTS

The requirements for the MA degree include the satisfactory completion of 30 hours of approved course work, of which at least 18 hours must be 400 level. The courses 404, Theory of Functions of Real Variables I, 413 Complex Analysis I, 432 Algebra I, and 468 General Topology I are required for the degree. Students are expected to make up any deficiencies in their undergraduate training in advanced calculus and abstract algebra, and may list on their graduate program no more than two of the courses Math 310, Math 311, Math 340 and Math 341. A written comprehensive examination is given in the final semester covering the material in the eight courses mentioned above. An additional oral examination may be required in some circumstances.

MASTER OF SCIENCE FOR TEACHERS

This degree is designed primarily for those whose major interest is in the teaching of mathematics at the secondary school level. It is designed to give the student a broad background in courses at the advanced-undergraduate --beginning-graduate level, but does not require the depth of study needed in the MA program. Courses in other fields, such as statistics and computer science, may be included as part of the program. A candidate for the degree must have a certificate valid

for teaching high school mathematics prior to completing the program for the degree. Requirements include 30 hours of course work, of which at least one course must be numbered above 400. At least two courses in each of the fields of algebra, analysis and geometry (including topology) must be included in the program. Comprehensive written and oral examinations are given near the end of the program.

MASTER OF SCIENCE IN APPLIED MATHEMATICS

The program for this degree is 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 400-level courses. Credit for Math 304 will not count toward the 30 hours. At least four 400-level courses must be taken in the Department of Mathematics, and at least three approved courses outside the department. Math 404, Theory of Functions of Real Variables I; 413, Complex Analysis I; and 408, Partial Differential Equations are required courses. 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, differential equations (other than Math 304 or 408) and mathematical statistics or probability. The candidate must pass a written examination over advanced calculus, real and complex analysis, linear algebra and ordinary differential equations. In some cases, an oral examination may also be required.

DOCTOR OF PHILOSOPHY

The doctor of philosophy degree 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 and must pass a qualifying examinations. Students with master's degrees from other institutions often are permitted to transfer this work to fulfill one-third of the PhD residence requirement and should expect to pass the qualifying examination shortly after beginning work here. In addition, the candidate must give evidence of reading proficiency in two foreign languages, complete a course of study approved by the advisory committee and pass a comprehensive examination.

This department has directed PhD work more than 70 years. The active areas of research interest of the current members of the staff are: commutative rings, complex analysis, continued fractions, control theory, convexity, dynamical systems, differential equations (ordinary and partial), differential geometry, functional

analysis, global analysis, group theory, integral equations, metric geometry, non-associative algebras, numerical analysis, operator theory, projective planes, semi-groups, topology and topological measure theory.

MECHANICAL AND AEROSPACE ENGINEERING College of Engineering

FACULTY

Kenneth M. Ragsdell, Huber O. Croft professor of engineering, Chairperson, PhD, University of Texas-Austin
Roger C. Duffield, professor, director of graduate studies, PhD, University of Kansas
Frederick W. Ahrens, professor, PhD, University of Wisconsin-Madison
Paul W. Braisted, professor, PhD, Standord University
William L. Carson, professor, PhD, University of Iowa
Donald L. Creighton, professor, PhD, University of Arizona
John C. Lysen, professor, PhD, Iowa State University
John B. Miles, professor, PhD, University of Illinois
Oran A. Pringle, professor, PhD, University of Wisconsin
Richard C. Warder Jr., professor, PhD, Northwestern University
David E. Wollersheim, professor, PhD, University of Illinois
J. Kenneth Blundell, associate professor, PhD, Salford University
C. Quinton Bowles, associate professor, PhD, University of Delft
Gaylord H. Bunch, associate professor, MS, University of Missouri-Columbia
Aaron D. Krawitz, associate professor, PhD, Northwestern University
Donald R. Smith, associate professor, PhD, University of Colorado
William E. Stewart, associate professor, PhD, University of Missouri-Rolla
George H. Stickney, associate professor, PhD, University of Michigan
Ross D. Young, associate professor, MS, Iowa State University
John P. Barton, assistant professor, PhD, Stanford University
Cho, Lee Wan, assistant professor, PhD, Brown University
Chyu, Ming-Chien, assistant professor, PhD, Iowa State University
Eric Sandgren, assistant professor, PhD, Purdue University
Sukere, Abdurahman, A., assistant professor, PhD, Michigan State University

GRADUATE DEGREES OFFERED

MS in mechanical and aerospace engineering

PhD in mechanical and aerospace engineering

The Department of Mechanical and Aerospace Engineering offers advanced study leading to the degrees of master of science and doctor of philosophy. Information on degree requirements for engineering licensure is detailed in the general Graduate School section under Professional Engineering Registration.

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 varied fields such as industry, teaching and government.

A student may pursue an area of concentration which may be selected from

design optimization, thermal systems, material science, design productivity, integrated manufacturing, heat transfer, robotics, mechanism synthesis, creep and fracture mechanics, automatic and microprocessor control, aerosol mechanics, boundary and finite element methods, alternate energy systems and computer aided design. Also the proximity of the UMC Schools of Medicine and Veterinary Medicine offers the opportunity for interdisciplinary research and study in the field of bio-engineering.

The department has a number of special laboratory areas which are constantly being upgraded. These laboratories are in the areas of interactive computer graphics, heat transfer and fluid mechanics, material science, design optimization, aerosol mechanics, microprocessors, creep and fracture mechanics and system dynamics.

In addition to the modern instrumentation and equipment normally found in well-equipped mechanical and aerospace engineering laboratories, the department has or has access to such speciality items as MTS and Instron material and structural test equipment, sub-sonic and supersonic wind tunnels, x-ray and electron microscope equipment, microprocessor development systems, electrohydraulic and electrodynamic vibration equipment and the largest university research reactor in the country. The University and the College of Engineering have an extensive computer systems consisting of Amdal main frame computers and Dec and Harris super mini computers. Complimenting these computer systems is an array of Megatek and Lexidata high resolution graphics terminals housed within the department. Students also have access to a group of departmental mini and personal computers.

The department currently has support for about two-thirds of its graduate students in the form of fellowships and research and teaching assistantships. Consideration of applications for financial support starts on March 1 of each year. Application forms and further information about the department can be obtained by writing the director of graduate studies, Department of Mechanical and Aerospace Engineering.

MASTER'S DEGREE

The master of science degree in mechanical and aerospace engineering is open to students with a BS degree in the same or a closely related field.

An applicant with a GPA of at least 3.0 (A = 4.0) or the equivalent during the last two years of undergraduate work may be admitted to the Graduate School on a basis of this record and three letters of recommendation. Lower GPAs require special action and substantiation, such as good test scores on the GRE or other recognized examination.

A program of study is developed by the student and the advisor, subject to ap-

proval by the departmental graduate committee and the department chairperson.

The minimum degree requirement is 30 semester hours including a special problem or a thesis project. A special problem consists of three to six hours of MAE 400, with not more than six hours total of MAE 300 (Problems) and 400 for programs terminating in a report. Alternatively, programs directed toward a thesis shall include six to nine hours of MAE 490. A thesis or a report must be read and approved by designated faculty members and placed on file in the departmental records. The successful completion of the MS final examination, administered by a faculty committee, fulfills the degree requirements.

A maximum of six hours of graduate course work taken at other accredited institutions may be transferred. Courses in the 300 series, if not required for the undergraduate degree in mechanical and aerospace engineering, may be used as part of the graduate program. Courses in the 200 series not in the Department of Mechanical and Aerospace Engineering also may be part of the program. Each program must have at least 15 hours of 400-level credit.

DOCTORAL DEGREE

PhD program applicants are closely and individually scrutinized. Minimum admission requirements include a strong record on the MS program and three letters of recommendation, one being from the applicant's MS advisor, if possible. All applicants are required to take the GRE examination.

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.

In addition to course work in engineering, it is expected that a student's program will include additional mathematics and basic science courses. Proficiency in reading one pertinent foreign language is required for the PhD degree. The customary foreign language is German or French; however, for good cause an appropriate substitution can be made. Alternatively, a special research technique or a collateral field can be substituted for the language.

A doctoral student must spend at least "one continuous year" beyond the master's degree level in full academic involvement on the Columbia campus. "One continuous year" is defined as either two 12-hour semesters or three 8-hour semesters successfully completed within 18 months. The graduate school's three-year requirement may be met by completing the equivalent of six 12-hour semesters beyond the bachelor's degree.

The PhD candidate plans a program of study and research under the immediate supervision of an advisor and in close cooperation with the advisory committee, appointed by the dean of the Graduate

School upon the adviser's recommendation.

A qualifying examination, consisting of both written and oral questions, is given soon after the student begins doctoral study. It is administered by a five-man committee selected by the student's advisor. When previously arranged, the MS final examination can be administered so that it also serves as the PhD qualifying examination. Successful completion of this examination is a prerequisite to formal acceptance into the PhD program. A comprehensive examination is given after all course work and language requirements have been satisfied. Upon completion of the program of study and research, a final examination, essentially a defense of the dissertation, is administered.

MEDIEVAL AND RENAISSANCE STUDIES AREA

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

MICROBIOLOGY School of Medicine

FACULTY

- Richard A. Finkelstein**, professor, chairperson, PhD, University of Texas
Mark A. McIntosh, assistant professor, director of graduate studies, PhD, University of Texas
James T. Barrett, professor, PhD, University of Iowa
Jane Berkelhammer, assistant professor (medicine and microbiology), PhD, University of Purdue
Helen Braley-Mullen, associate professor (medicine and microbiology), PhD, University of Purdue
Olen R. Brown, professor (veterinary microbiology and microbiology), PhD, University of Oklahoma
Michael S. Cooperstock, associate professor child health (assistant professor microbiology), MD, University of Michigan
Frank B. Engley Jr., professor, PhD, University of Pennsylvania
Herbert S. Goldberg, professor of microbiology, PhD, Ohio State University
Reuel R. Hook Jr., associate professor, microbiologist, Sinclair Comparative Medicine Research Farm, PhD, University of West Virginia
Ronald M. McLaughlin, assistant professor, director laboratory animal medicine, DVM, Iowa State University
Michael L. Misfeldt, assistant professor, PhD, University of Iowa
Joseph T. Parisi, professor, PhD, Ohio State University
Charlotte D. Parker, associate professor, PhD, University of California-Los Angeles
Hammond G. Riggs Jr., associate professor, PhD, Texas Southwestern
Ronald F. Sprouse, professor (microbiology and pathology), PhD, Oklahoma University
Kim S. Wise, assistant professor, PhD, Southern California University
Ji-Won Yoon, professor, PhD, University of Connecticut

GRADUATE DEGREES OFFERED

- MS in microbiology (medicine)**
PhD in microbiology (medicine)
COOPERATIVE DEGREES
MD and PhD in microbiology (medicine)
INTERDISCIPLINARY AREA PROGRAM
PhD in microbiology area program

The Department of Microbiology offers individualized graduate programs designed to prepare students for advanced professional careers in microbiology. Emphasis is placed on the doctor of philosophy (PhD) program designed to develop outstanding students for productive supervisory roles in universities and colleges, industry, research institutes, public health and hospital laboratories. The PhD degree is only offered to students who demonstrate a high level of specialized knowledge and clear evidence of research potential. The master of science (MS) program requires about two years of advanced study culminating in a research thesis under the supervision of the student's advisor.

Many students in the doctoral program are awarded teaching or research assistantships. Under the guidance of faculty members, teaching assistants are given practical experience in planning, organizing, teaching and laboratory preparation in microbiology. Research assistants work with faculty members to obtain practical experience in the planning of research proposals, the collection of research data and the writing of research reports. All students in the graduate program are required to participate as teaching assistants during their graduate studies.

The department 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, genetics and virology.

ADMISSION REQUIREMENTS

Enrollment is limited to those students who show evidence of potential for research. Minimum requirements for admission to the graduate program include a baccalaureate degree from an acceptable college or university, with courses in the following: biology (botany or zoology, plus at least one advanced course); chemistry (quantitative and organic); physics (one year); and mathematics (college algebra, analytic geometry or trigonometry). Applicants are required to provide their scores on the Graduate Record Examination and letters of recommendation from individuals who are competent to comment on the applicant's potential for graduate work.

MASTER'S DEGREE

The minimum course requirements for completing the MS degree are 30 hours of graduate study, 16 of which must be in courses numbered 400 or above. The 30 hours of graduate credit are composed of the following:

- 301 Medical Microbiology (8 hours)
- 401 Advanced Medical Microbiology (2 hours)
- 410 Seminar - continuous enrollment (to a maximum of 4 hours toward the required 30 hours)
- 490 Research/400 Problems (7 hours)

Other departmental courses (9 hours)

It is strongly recommended that new students enroll in a biochemistry course during their first semester as a graduate student in the department. To fulfill the degree requirements a student must complete original research in preparation of a thesis, and pass an oral examination in defense of the thesis and covering course work.

DOCTORAL DEGREE

To be accepted for candidacy into the PhD program in microbiology, all applicants must perform satisfactorily on a qualifying examination prepared and evaluated by all full-time faculty members in residence at the time of the examination. Part-time faculty members and joint appointees may contribute to the qualifying examination. The PhD program consists of the following:

- (1) a course of study in which a minor field may be recommended;
- (2) a demonstration of competence in a foreign language, or three hours of course work of an advanced nature in a discipline approved by the department and outside the usual study plan;
- (3) practical experience in teaching;
- (4) successful completion of a comprehensive examination, and
- (5) a demonstration of research and writing ability by completing a scholarly dissertation on an approved research problem which results in the contribution of significant new knowledge.

Under the guidance of an advisory committee, a course of study is individually designed to fit each student's academic background, experience and objectives.

Minor fields may include biochemistry, chemistry, genetics, statistics or other areas. The minor field(s) provides breadth and balance in the program and enhances the student's research abilities. First and second minors may be designated; a minor field comprises 15 semester hours of work carrying graduate credit from a single department.

A final examination primarily covers the dissertation.

MICROBIOLOGY AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

MUSIC

College of Arts and Sciences

FACULTY

- Donald E. McGlothlin, professor, chairperson, PhD, University of Iowa
- Alexander Pickard, associate professor, assistant chairperson DMA, Eastman School of Music
- James A. Middleton, professor, director of graduate and undergraduate studies in music and music education, DMEd, University of Oklahoma

John E. Cheetham, professor, DMA, University of Washington

Duncan Couch, professor, PhD, University of Kansas

Raymond Herbert, professor, MM, Eastman School of Music

Richard L. Hills, professor, PhD, University of Iowa

Dale Kennedy, professor, PhD, Oklahoma University

Andrew C. Minor, professor, associate dean, Graduate School, PhD, University of Michigan

Harry S. Morrison Jr., professor, MFA, University of Iowa

Charles H. Sherman, professor, PhD, University of Michigan

Carleton B. Spotts, professor, MM, Manhattan School of Music

James M. Burk, associate professor, DMEd, University of Oklahoma

Carolyn Kenneson, associate professor, MM, University of Texas

W. Thomas McKenney, associate professor, PhD, University of Rochester

John McLeod, associate professor, MM, Manhattan School of Music

Perry Parrigin, associate professor, MM, University of Indiana

Ira C. Powell, associate professor, DMEd, University of Oklahoma

Virginia T. Pyle, associate professor, DM, Florida State University

Betty Scott, associate professor, PhD, Florida State University

Eva D. Szekeley, associate professor, MS, Juilliard School of Music

Edward R. Thaden, associate professor, DM, Florida State University

Janice Wenger, associate professor, MM, Eastman School of Music

Barbara Wood, associate professor, MA, University of Missouri-Columbia

Edward Dolbashian, assistant professor, MMA, Yale University

Steve Geibel, assistant professor, MM, University of Missouri-Columbia

J. Russell Laib, assistant professor, MM, Cincinnati College-Conservatory of Music

Jeffrey J. Lemke, assistant professor, DMA, University of Arizona

Laurence C. Lowe, assistant professor, MM, Eastman School of Music

Dan L. Willett, assistant professor, MM, Michigan State University

Michael Budds, instructor, MA, University of Iowa

Sue Stubbs, instructor, BM, Juilliard School of Music

Tom Stubbs, instructor, BS, Juilliard School of Music

GRADUATE DEGREES OFFERED

MA in music

MM in music

The Department of Music offers graduate work leading to a master of art and a master of music degree in music. In the MA program the student may concentrate in music history, theory and composition.

In the MM program, the student may concentrate in theory, composition, applied music or choral conducting. Educational degrees with a major in music education are offered by Department of Curriculum and Instruction, College of Education in conjunction with the Department of Music. These degrees include the MA, MED, EDSP, EdD and PhD in education with an emphasis area in music education.

At UMC a student of music has an unusual opportunity to participate in varied performing organizations. A series of recitals are given by students, faculty and visiting artists, several concerts are given during the year by the UMC Philharmonic, concert bands, University choral ensembles, Collegium Musicum, the

Esterhazy Quartet, the Missouri Arts Quintet and the Faculty Brass Ensemble.

The music section of the Fine Arts Building contains a recital hall, classrooms and studios—all air-conditioned and suitably equipped.

The Art, Archaeology and Music Library is one of eight subject-oriented divisions within Ellis Library. The fine arts holdings here number more than 25,000. The department maintains an electric keyboard laboratory for class piano, an electronic music studio and access to a listening laboratory for music history and theory courses.

For course requirements of the various sequences, write the department for its bulletin. Students also may request information on assistantships and other financial aids.

All entering graduate students are required to take examinations in music history, music theory and their major applied area. Music education, students also have an examination in their field. The entrance examinations begin at 9:00 a.m. on the first day of registration in August, January or June in Room 146, Fine Arts Building.

MASTER OF MUSIC DEGREE

The applied areas of performance are piano, piano accompanying and pedagogy, organ, strings, voice, wind and percussion instruments. A candidate must have a B.M. in the same area or its equivalent. If a senior recital was not presented for the B.M., then such a program must be given by the student prior to the graduate recital. Other prerequisites for admission are performance ability of graduate level as determined by an audition for a committee in the applied area and a foreign language requirement of 13-20 hours, depending on the major.

To satisfy the requirements for the MM degree concentrating in one of the applied areas, a student must complete 32 hours of graduate work, with a minimum of 16 hours at the 400 level. Admission to 400-level courses is determined by audition. In all areas, 6 hours of music history and 6 of music theory at the 300 level are required. Graduate-level courses in the area, repertory and electives, complete the course requirements. The graduate recital has a faculty hearing in advance of the public performance. Piano majors present, in addition to the graduate recital, a memorized performance of a concerto with orchestra or second piano.

The prerequisites for the master of music degree in theory and in composition include:

- (1) admission to Graduate School;
- (2) bachelor's degree in music;
- (3) evidence of study and satisfactory completion of 18 hours in basic theory courses (including 2 hours of form and analysis), 4 hours of 16th- or 18th-century counterpoint, 4 hours of orchestration and 2 hours theory elective;
- (4) 4 hours of music history; and

(5) 16 hours or the equivalent of undergraduate applied music.

All candidates must file a formal application with the theory staff for admission to the program. Other requirements include a thesis, final oral examination and a proficiency audition in sight singing and keyboard harmony.

The program of study consists of a minimum of 33 hours including 22 hours of advanced courses in theory (including a thesis, 4 to 6 hours), 5 to 6 hours of music history and 5 to 6 hours of applied music.

Entrance to concentration in Choral Conducting is based on a prior bachelor's degree which was based on a choral/vocal major. The program includes: Introduction to Graduate Study in Music (2 hours); 6 hours in both music history and music theory; 4 hours in applied music or vocal techniques; 4 in conducting; from 8 to 12 in choral repertory, choral techniques, and choral ensemble/opera production; from 2-6 credit hours in electives; and 1 to 2 hours credit for choral conducting recitals.

MASTER OF ARTS DEGREE

Prerequisites for the MA concentrating in music history are admission to the Graduate School; two years of piano; sufficient proficiency in technique and sight reading to be of use as a tool for investigation; 16 hours in harmony, ear-training, and sight singing; 4 hours in counterpoint, 4 hours in form and analysis; 8 hours of music history; and reading knowledge of at least one foreign language.

The music history major may include 8 hours of upper-class work in applied music courses, numbered 300 or above, in partial satisfaction of the requirements for the degree. Music history courses 321, 322, 323 or 324 may be included for graduate credit if not used to satisfy prerequisites for admission. In addition to the course requirements of 14-20 hours of music history and an outside course, a formal thesis on some phase of music history is required. This may count as up to 8 hours graduate credit in Music 490. In lieu of a formal thesis, a public recital may be substituted, subject to a pre-recital faculty hearing. In addition to the recital, each non-thesis major must elect Music 400 for 8 hours, which includes a survey of the literature in the applied field. As a part of this survey, the student must write three extended term papers.

The prerequisites for the MA with concentration in theory are the same as those for the MM with concentration in theory.

The requirements for the program of study include:

- (1) 18 to 22 hours of advanced courses in theory (including a thesis, 4 to 6 hours);
- (2) 5 to 6 hours of music history;
- (3) 5 to 6 hours in areas other than music; and
- (4) 2 hours in an applied area (optional).

A minimum of 32 hours is essential for the above degree.

All master and doctoral degree candidates must pass a final written comprehensive examination after completion of course work for the degree. For information regarding the prerequisites and program of study for the MA degree in composition, write to the department chairperson.

NUCLEAR ENGINEERING College of Engineering

FACULTY

W.R. Kimel, dean of the College of Engineering, professor of nuclear engineering, PhD, University of Wisconsin

J.F. Kunze, professor, chairperson of nuclear engineering,

Robert Lee Tatum Chair of Engineering, PhD, Carnegie Institute of Technology

W.R. Miller, associate professor of nuclear engineering, director of graduate studies, co-director of the energy systems and resources program, PhD, University of Missouri-Columbia

R.M. Brugger, professor of nuclear engineering, professor of physics, director of MURR, PhD, Rice University

R.L. Carter, professor of electrical engineering, professor of nuclear engineering, PhD, Duke University

L.A. Corwin, professor of veterinary medicine, adjunct professor of nuclear engineering, PhD, Colorado State University

R.A. Holmes, professor of medicine, professor of radiology, professor of nuclear engineering, chief of nuclear medicine service, Truman Veterans Hospital, MD, Temple University

S.K. Loyalka, professor of nuclear engineering,

Huber O. Croft Chair of Engineering, PhD, Stanford

A.H. Emmons, professor emeritus of nuclear engineering, PhD, University of Michigan

J.R. Vogt, professor emeritus of nuclear engineering, PhD, University of Kentucky

E.M. Edwards, adjunct professor of nuclear engineering, director of medical physics, Bethany Hospital (Kansas City, KS), PhD, University of Colorado

R.R. Hurst, adjunct professor of nuclear engineering, director of medical physics, Boone Hospital Center, PhD, Pennsylvania State University

W. Meyer, adjunct professor of nuclear engineering, director, Syracuse University of Institute for Energy Research, PhD, Oregon State University

P.K. Lee, associate professor of nuclear engineering, director of health physics services, PhD, Purdue University

W.K. Logan, associate professor of nuclear engineering, associate professor of radiology, PhD, University of Missouri-Columbia

D.R. Smith, associate professor of nuclear engineering, director of engineering education, University of Missouri-Kansas City, PhD, University of Colorado

D.M. Alger, assistant professor of nuclear engineering, associate director of MURR, PhD, University of Missouri-Columbia

S.M. Langhorst, assistant professor of nuclear engineering, research scientist at MURR, PhD, University of Missouri-Columbia

MA Prelas, assistant professor of nuclear engineering, PhD, University of Illinois, Champaign/Urbana

W.L. Kennedy, adjunct assistant professor of nuclear engineering, medical physicist, regional radiation therapy, PhD, University of California-Berkeley

GRADUATE DEGREES OFFERED

MS in nuclear engineering

MS in nuclear engineering with an emphasis in health physics

MS in nuclear engineering with an emphasis in medical physics

PhD in nuclear engineering

The area program in nuclear engineering offers graduate work and supervised research experience leading to the de-

degrees of master of science and doctor of philosophy. Emphasis areas leading to a master of science degree can be pursued in medical physics, health physics and nuclear engineering.

Area research topics include nuclear materials management, aerosol mechanics, reactor safety analysis, nuclear energy conversion, reactor designs, non-destructive inspection, radiative heat transfer, neutron spectrometry, neutron and gamma ray transport, neutron activation analysis and nuclear plasma research.

Area research is conducted in several special facilities and laboratories. The University of Missouri Research Reactor (MURR), a 10 megawatt facility, has the highest steady-state neutron flux of any U.S. university reactor. Surrounding the reactor is a 26,000-square-foot laboratory facility for nuclear research.

Other facilities include the subcritical training reactor, an EMI computed tomography scanner, Co irradiator, a Harris-800 super minicomputer, nuclear instrumentation, and digital computers. Library resources include Ellis Library with more than 1,800,000 volumes and the Engineering Library with more than 30,000 volumes.

Financial assistance includes federal, industrial, and UMC fellowships; teaching and UMC research assistantships; and sponsored research assistantships, as well as special fellowship opportunities for women and minorities. Nuclear engineering at UMC is a participating university in the Oak Ridge Associated Universities Nuclear Science and engineering fellowships, the ORAU health physics fellowships, and the Graduate and Professional Opportunities Program fellowships for racial minorities and women. Students on probation and foreign students with no prior educational record in the U.S. are not eligible for financial assistance through the nuclear engineering program during the first semester of their programs. (Those who perform satisfactorily during their first semester are eligible for consideration for financial assistance during their second semester.)

To be admitted for graduate study in nuclear engineering, you are required to:

1. Have an undergraduate degree (with a strong math background) in physics, biology, chemistry, mathematics, or engineering from an accredited institution with a minimum grade point of 3.0 (A=4.0) in your last two years.
2. Take Part One of the GRE Exam prior to or during your first semester of graduate study. Foreign students should submit scores from the TOEFL exam.
3. Have three letters of recommendation from previous instructors who are familiar with your qualifications for graduate study sent to the Nuclear Engineering Graduate Studies Office, 0039 Engineering Building. If you are applying to the PhD

program, one of these letters must be from your MS advisor.

4. Have transcripts from all your college or university coursework sent to both the Nuclear Engineering Program Graduate Studies Office, and to the Admissions Office, 130 Jesse Hall.
5. Submit an application for admission to the Nuclear Engineering Program Graduate Studies Office.
6. If you are entering the PhD program your study program will be individually evaluated by the nuclear engineering faculty. The PhD program is a research program and is tailored to meet your educational needs. To qualify for the PhD program, you must pass a qualifying examination in your first semester of study.

DEGREE REQUIREMENTS

Medical Physics. The master's program in the medical physics option emphasizes three areas of radiology: diagnostics, nuclear medicine, and radiation therapy. Medical physics applies physics and engineering concepts and methods to the diagnosis and treatment of human disease. The curriculum consists of 41 course hours that can be completed in two years and does not require a thesis. Students pursuing a PhD in this option will select a suitable dissertation topic in the medical physics area.

Health Physics. This option in nuclear engineering is devoted to the protection of people and the environment from radiation and environmental contaminants. Health physics is concerned with dosimetry, shielding design, radiation biology and instrumentation development, and the development and implementation of the methods and procedures to evaluate and deal with environmental hazards (particularly effluents from power plants). UMC offers both the master's (requiring 37 hours and no thesis) and PhD in health physics. The PhD degree is a research degree.

Nuclear Engineering. Two programs of study exist within the nuclear engineering option: the basic nuclear engineering program (for students of fission and/or fusion processes); and the nuclear power engineering program (for students with bachelor's degrees in electrical engineering). Students in either of these programs must meet the basic criteria for entering graduate study in nuclear engineering. The nuclear power engineering program is a joint electrical engineering/nuclear engineering program at the master's level, requires 30 hours, and is a non-thesis degree. The nuclear engineering program is a degree program that requires 30 hours, a thesis, and assumes that you are entering graduate study with a bachelor's degree in engineering from an ABET-accredited school. Students with other backgrounds will be required to complete undergraduate courses in thermo-

dynamics, heat and mass transfer, engineering materials and other prerequisite engineering courses based on the student's particular background. The PhD degree in both of these programs is a research degree, with a suitable dissertation topic to be chosen in the respective field.

NURSING School of Nursing

FACULTY

- Phyllis D. Drennan**, professor, dean, PhD, University of Iowa
Ann M. Rosenow, professor, associate dean for research and director of graduate studies, PhD, University of Chicago
Shirley L. Dooling, associate professor, assistant dean and director of undergraduate program, EdD, Teachers College
Virginia P. Hagemann, professor, PhD, University of Pittsburgh
Gerald T. Brouder, associate professor, PhD, University of Texas at Austin
Betty Crim, associate professor, MEd, University of Missouri-Columbia
Elizabeth Geden, associate professor, PhD, University of Missouri-Columbia
Barbara Shelton, associate professor, PhD, University of Missouri-Columbia
Susan G. Taylor, associate professor, PhD, Catholic University
Virginia M. Bzdek, assistant professor, PhD, University of Oregon
Lawrence H. Ganong, assistant professor, PhD, University of Missouri-Columbia
Karna Kruckenberg, assistant professor, PhD, University of Missouri-Columbia
Mary A. Manderino, assistant professor, PhD, Arizona State University
Phyllis Watson, assistant professor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MS in nursing

The School of Nursing offers a graduate program leading to the master of science degree. The program provides preparation in community mental health nursing, child health nursing, adult nursing and as family nurse practitioner. The program also offers role preparation as educator, clinician or administrator. The program is accredited by the National League for Nursing.

Upon completion of the master's program in nursing, the student will be able to:

- (1) examine the fields of nursing knowledge with an emphasis on nursing science;
- (2) use the professional process in the definition and solution of problems within nursing (professional, clinical, organizational);
- (3) apply self-care deficit theory to the design, implementation and evaluation of nursing systems using an advanced theory base relevant to the particular clinical area;
- (4) exercise nursing agency, within a defined clinical area, in situations where: (a) application of theory is not well developed, (b) required technology is not developed or is extremely complex, or (c) where predictability of outcomes is low;
- (5) design, implement, and evaluate studies which are derived from self-care deficit theory;

- (6) develop agency to perform a selected role within the nursing profession and interprofessionally.

Students in the School of Nursing have access to all campus libraries and the various services they provide. The new School of Nursing building is conveniently located adjacent to the University Hospital and Clinics which includes the Rusk Rehabilitation Center. Other clinical agencies in the immediate vicinity include the Truman Veterans Hospital and the Mid-Missouri Mental Health Center. A wide variety of learning experiences are also available at other hospital and health agencies in and around Columbia.

Some financial assistance in the forms of scholarships, assistantships, and traineeships is available. Detailed information may be obtained by writing to director of graduate studies, School of Nursing, UMC.

ENTRANCE REQUIREMENTS

- (1) Graduate from a baccalaureate nursing program accredited by the National League for Nursing.
- (2) A minimum GPA of 3.0 on a 4.0 scale for the last 60 credits of the baccalaureate program.
- (3) Evidence in the form of letters of reference from 2 qualified persons able to predict the applicant's ability to succeed in graduate study.
- (4) Licensure as a Missouri Registered Professional Nurse.
- (5) A total score of 1000 on the verbal and quantitative sections of the graduate record examination aptitude test. If other criteria are strong, a minimum score of 800 may be considered for admission. The GRE must have been taken within 5 years prior to application.

DEGREE REQUIREMENTS

To satisfy requirements for the MS a student must:

- (1) complete an approved program with a cumulative GPA of 3.0 (A = 4.0);
- (2) successfully defend a written thesis or research project;
- (3) complete the program within a 5-year period.

NUTRITION AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

PATHOLOGY School of Medicine

FACULTY

John F. Townsend, professor, chairperson, MD, University of Missouri-Columbia
Arlene P. Martin, professor, director of graduate studies, PhD, University of Rochester
Marie L. Vorbeck, professor, PhD, Cornell University
Edward H. Adelstein, associate professor, DVM, MD, University of Missouri-Columbia
Linda E. Ansbacher, assistant professor, MD, Kansas University

Alan M. Luger, assistant professor, MD, Duke University

GRADUATE DEGREE OFFERED MS In pathology INTERDISCIPLINARY AREA DEGREES PhD in pathology area program

The Department of Pathology in the School of Medicine offers graduate work leading to the master of science degree. The department together with the Department of Plant Pathology in the College of Agriculture and the Department of Veterinary Pathology in the College of Veterinary Medicine offer an area PhD program in pathology, presented in the AREA PROGRAMS section of this catalog.

Resources for research in pathology include standard and special use equipment in the laboratories. Faculty and staff members provide guidance and practical supervision in clinical and experimental research.

The MS degree is designed primarily to prepare students for teaching in medical technology or for supervisory roles in clinical laboratories. The degree also is considered a preparation for the doctoral degree which prepares a person for a teaching and/or research career.

DEGREE REQUIREMENTS

Admission to candidacy in the master's program is limited to those who hold a baccalaureate degree from an accredited college or university. GRE scores should be submitted on the general aptitude section of the examination.

Requirements for the degree include:

- (1) a minimum of 30 semester hours, with 15 or more hours at the 400 level;
- (2) maintenance of a B or better GPA in graduate course work;
- (3) no more than 12 hours of research, problems or special investigations culminating in a dissertation; and
- (4) satisfactory performance on a final examination. A candidate is expected to demonstrate knowledge of clinical and research techniques and to defend the dissertation.

Faculty members advise students in the preparation of a program of study. Required courses and those of special interest should complement the student's academic background and career objectives.

PATHOLOGY AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

PHARMACOLOGY School of Medicine

FACULTY

Hyun Dju Kim, professor, chairperson, PhD, Duke University

Walter D. Wosilait, professor, director of graduate studies, PhD, Johns Hopkins University
David B. Bylund, associate professor, director of graduate admissions, PhD, University of California
Tihamer Z. Csaky, professor, director of medical studies, MD, University of Budapest
Leonard R. Forte, professor, PhD, Vanderbilt University
Robert L. Russell, professor, PhD, University of Missouri-Columbia
Keith H. Byington, associate professor, PhD, University of South Dakota
Friedhelm Schroeder, associate professor, PhD, Michigan State University
Allen L. Neese, assistant professor, MD, PhD, University of Vermont
Shivendra D. Shukla, assistant professor, PhD, University of Liverpool
Vincent St. Omer, assistant professor, PhD, University of Guelph (Canada)
Myron L. Toews, assistant professor, PhD, University of Wisconsin
Ronald Walkenbach, assistant professor, PhD, University of Missouri-Columbia
Robert B. Zeidler, assistant professor, PhD, West Virginia University
John T. Turner, instructor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MS in pharmacology PhD in pharmacology

The Department of Pharmacology offers graduate programs leading to the degrees of master of science and doctor of philosophy. The master of science program can be used as a step toward the PhD program, although the MS is not required.

Graduate programs in pharmacology are designed to prepare students for academic teaching and research, research career positions in government or industrial research in pharmacology. For doctoral research, the student may select from a variety of areas of active research in this department. These areas include absorption, biotransformation, distribution and excretion of drugs, toxicology, actions of drugs on the autonomic nervous system, gastrointestinal actions of drugs, mechanisms of action of anticoagulant drugs, metabolism of calcium-hormone receptor mechanisms, renal pharmacology, psychopharmacology, neuro-pharmacology, mechanisms of narcotic addiction, developmental pharmacology, effects of drugs on functional and physicochemical properties of membranes of normal cells and cancer cells, mechanisms of oncogenesis, cyclic nucleotide metabolism of tissues including kidney, bone, eye, salivary and liver, and endocrine pharmacology. The major emphasis of the department is on biochemical and molecular aspects of pharmacology.

Cooperative programs with the College of Veterinary medicine and the nearby Sinclair Research Farm provide research opportunities in a comparative pharmacology laboratory where effects of drugs on large domesticated animals such as horses, goats, sheep and swine are investigated. A large modern animal care center under the direction of a veterinarian is located within the health sciences center, where small laboratory animals are maintained for acute and chronic drug studies. The program is enriched by

meaningful interaction with the Colleges of Arts and Science, Agriculture, Veterinary Medicine, The Truman Veterans Hospital, Engineering and the School of Medicine. The cooperative research atmosphere on the campus encourages staff and students to work across departmental lines. This arrangement provides for a unique educational opportunity for training in many areas of pharmacology.

Within the limits of the department's resources, research assistantships are available to qualified graduate students who are candidates for the PhD degree in pharmacology. Usually students are admitted in the fall semester. Applications should be submitted by March 1. Additional information can be obtained from the director of graduate admissions, Department of Pharmacology, M517 Health Sciences Center, UMC, Columbia, Mo. 65212.

DEGREE PROGRAMS

Admission to the PhD program is open to students with a good background in biology and chemistry and an understanding of mathematics and physics. Deficiencies may be remedied during the first year of the graduate program. A bachelor's degree in either chemistry, biology, pharmacy or related areas from an acceptable accredited college is recommended.

To satisfy requirements for the MS degree, a student must complete the professional program of study with an average grade of B (3.0) or better and pass an oral comprehensive examination over an acceptable master's dissertation. Candidates also must comply with other regulations governing master's degrees. In the selection of students, preference is given to those who wish to enter the doctoral program.

The doctoral program normally requires four years beyond the baccalaureate degree. A master's degree is not required. Entrance directly into the PhD program is possible for students with an appropriate educational background. If a master's degree is received, either at UMC or elsewhere, the program for the PhD degree usually requires two-three years of additional work.

Applicants for an advanced degree should have a 3.0 (A=4.0) or higher overall GPA in undergraduate work. Consideration is given to a variety of other criteria serving as predictors of probable success in graduate study. All students are required to achieve a combined score of at least 1100 on the GRE. A potential candidate for the PhD must pass a qualifying examination approved by the planning committee and given by the department. No foreign language or specific correlative skill is required. A candidate must pass a comprehensive written and oral examination over the field of pharmacology, complete an acceptable dissertation, pass a final oral examination on the dissertation, and comply with all

university and departmental regulations governing the PhD degree.

PHILOSOPHY College of Arts and Sciences

FACULTY

John Kultgen, professor, chairperson, PhD, University of Chicago

Donald E. Sievert, professor, director of graduate studies, PhD, University of Iowa

Joseph Bien, professor, PhD, University of Paris

William Bondeson, professor, PhD, University of Chicago

Arthur Berndtson, professor emeritus, PhD, University of Chicago

Bina Gupta, associate professor, PhD, Southern Illinois University

Peter Markie, associate professor, PhD, University of Massachusetts

Alexander von Schoenborn, associate professor, director of graduate studies, PhD, Tulane

Marvin Belzer, assistant professor, PhD, University of North Carolina

GRADUATE DEGREES OFFERED

MA in philosophy

PhD in philosophy

The Department of Philosophy offers a program of graduate study leading to the MA and PhD degrees in the major fields of philosophy. A standard selection of undergraduate and graduate courses is provided, with advanced courses in areas determined by faculty members' specialties and graduate students' interests.

The department prepares philosophers and philosophy teachers by giving graduate students full responsibility for underclass sections of logic, ethics and introduction to philosophy. Faculty directors assist in the preparation of courses and after class visits suggest improvements in teaching techniques. Teaching at least one of the underclass courses is a prerequisite for a PhD. The department offers a graduate seminar in the teaching of philosophy.

Publication of research by graduate students is encouraged. Prominent off-campus philosophers visit the department yearly for talks and symposia.

Fellowships and teaching assistantships are available to qualified students. Applications for fellowships must be submitted by February 15 and for teaching assistantships by March 1. Application forms and information may be obtained from the director of graduate studies.

MASTER'S DEGREES

Graduate work in philosophy requires the equivalent of the following six courses: logic, ethics, ancient western philosophy, early modern philosophy, 19th-century philosophy, and contemporary philosophy. Deficiencies may be made up after the student is enrolled at UMC.

Normally admission requirements are a 3.0 (A = 4.0) in all undergraduate work for the last four semesters, with a 3.25 average in all philosophy courses; three letters of recommendation; and the GRE Aptitude Test. Applicants are judged not only on the basis of grades and test

scores, but also on the general reputation of their undergraduate institution, recommendations and other evidence of serious intent and intellectual ability. Any unusual circumstances regarding failure to meet the minimum requirements should be called to the attention of the director of graduate studies.

MA degree requirements are: 30 semester hours of graduate work, 15 of which must be at the 400 level.

At least 80 percent of the hours submitted for the master's program must be completed with a grade of A or B.

The MA requires a thesis or alternative written performance displaying sustained research and philosophical analysis.

DOCTORAL DEGREE

For students entering the graduate program for the first time, acceptable performance on the GRE is required. Applicants are required to have three letters of recommendation from persons familiar with their prior work in philosophy, and are urged to submit other evidence of serious intent and intellectual ability.

Candidacy is established by a qualifying examination. Superior performance on the MA in the department may be accepted as the qualifying examination.

Requirements for the PhD may be fulfilled by satisfying the following:

--three years of residence beyond the bachelor's degree including two 12-hour or three 9-hour semesters during a period of 18 months after the MA:

--an MA from another university may be considered as equivalent to one year of residence;

--ability to read philosophical texts with facility in Greek, Latin, German, French, Spanish or Italian. Another language may be substituted with the approval of the department if it is not the student's native tongue and is relevant to his or her doctoral research,

--a distribution of graduate courses among groups defined by the department. These include courses devoted to topics and to historical figures and movements of the past and present. The distribution requirement occupies about half of the student's residency;

--a comprehensive examination at the end of residency testing the student's familiarity with the literature and ability to analyze the issues pertaining to a topic or problem or the thought of a figure in four areas: epistemology, metaphysics, axiology, history of philosophy;

--a dissertation and a final oral examination on the dissertation.

PHYSICAL SCIENCE AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

PHYSICS

College of Arts and Sciences

FACULTY

Henry W. White, professor, chairperson, PhD, University of California-Riverside
David L. Cowan, professor, PhD, University of Wisconsin
Horace R. Danner, professor, PhD, Pennsylvania State University
Brian DeFazio, professor, PhD, Texas A&M University
Eugene B. Hensley, professor, PhD, University of Missouri-Columbia
Louis V. Holroyd, professor, PhD, University of Notre Dame
Paul W. Schmidt, professor, PhD, University of Wisconsin
Haskell Taub, professor, PhD, Cornell University
Clifford W. Tompson, professor, PhD, University of Missouri-Columbia
Samuel A. Werner, professor, PhD, University of Michigan
Joseph E. Willett, professor, PhD, University of Missouri-Columbia
Newell S. Gingrich, professor emeritus, PhD, University of Chicago
H.R. Chandrasekhar, associate professor, PhD, Purdue University
Terry W. Edwards, associate professor, PhD, University of Wisconsin
Justin C. Huang, associate professor, PhD, Michigan State University
Keum H. Lee, associate professor, PhD, Iowa State University
Charles J. Peterson, associate professor, PhD, University of California-Berkeley
Guy Schupp, associate professor, PhD, Iowa State University
Meera Chandrasekhar, assistant professor, PhD, Brown University

JOINT FACULTY

Robert Brugger, professor of physics and nuclear engineering, director of research reactor, PhD, Rice University
John Farmer, professor of physics, program director, research reactor, PhD, Kansas State University
William Yelon, associate professor, group leader of research, PhD, Carnegie-Mellon
Ronald Berliner, assistant professor, sr. research scientist, PhD, University of Illinois
David Mildner, assistant professor, sr. research scientist, PhD, University of Michigan
Helmut Kaiser, sr. research scientist, PhD, Technical University, Vienna, Austria

GRADUATE DEGREES OFFERED

MST (master of science in teaching)

MS in physics

MS in physics with an emphasis in medical physics

PhD in physics

Research Program Areas. The department has active research programs in the following areas. Astronomy/astrophysics: stellar interiors, kinematics and structure of elliptical and spiral galaxies, black holes, general relativity and quantum gravity; condensed matter physics, neutron scattering on a variety of solids, liquids and surfaces, neutron interferometry, light scattering and other optical studies of solids and surfaces (including high pressures and low temperature properties); nuclear magnetic and electron spin resonance of magnetic systems and biopolymers; x-ray scattering from solids, liquids, gases, and surfaces; gamma-ray scattering on a variety of materials, low temperature heat capacity, electron tunneling, low energy electron diffractions, and laser infrared spectroscopic studies of surfaces and adsorbates.

Mathematical physics: inverse scattering theory, geometrical mathematical physics, non-linear phenomena.

Particles and Fields: Elementary particles and fields, general relativity, scattering theory.

Theoretical Plasma Physics: Stimulated Raman and Brillouin backscattering, magnetic plasmas.

MST DEGREE

The master of science-physical science degree is designed primarily for teachers, and emphasizes broad training in physics, chemistry and mathematics. For degree requirements, refer to the section on Regulations for Master's Degree Program.

MS-PHYSICS

The master of science degree in physics prepares students for a variety of scientific careers. Since physics is the most fundamental of the physical science, graduate-level studies in the field provide essential knowledge for application in many areas. Students with strong backgrounds in areas ranging from biology to engineering are encouraged to consider a personalized MS program by which they add experimental or theoretical physics techniques to their own skills. Likewise, candidates for the MS degree are encouraged to consider advanced courses in other scientific disciplines. Courses in such related fields as astronomy, biology, chemistry, geology, computer science, mathematics and engineering may be counted toward the MS degree. Students interested in the PhD degree in traditional physics may be advised to concentrate more of their program in physics.

In general, students must present 30 credit hours for the MS degree, including at least 15 hours in courses numbered 400 or above. The program must include at least 15 hours of physics courses. There is no foreign language requirement.

A formal thesis is not usually required for the MS degree, but some research is essential, including a report on the results; and 3-6 hours of research credit normally is required. Thesis credit may be earned for work done in the physics department, or in a related area, at the discretion of the student and advisory committee. Master's candidates must pass a qualifying examination and an oral examination prior to their graduation.

Graduate students in physics are expected to take a full and active part in departmental activities. Participation in research programs, departmental lectures and colloquia are considered a normal part of a graduate program.

PHD-PHYSICS

The doctor of philosophy degree is designed to educate scientists capable of independently formulating and solving problems of fundamental importance.

For acceptance as PhD degree candidates, students must pass a qualifying examination at an advanced level. The specific program of study for a PhD in physics, planned in consultation with

the student's advisory committee, is selected to fit each student's academic background, experience and objectives. There is no foreign language requirement.

The candidate is required to pass a written and oral comprehensive examination. At the time of the examination, the candidate must have completed (or be currently enrolled in) all of the courses in the PhD program. In special cases, the examination may be taken with one course outstanding.

The candidate shall carry out original research and present an acceptable doctoral dissertation on a topic approved by the candidate's advisory committee. The candidate must successfully defend the dissertation in a final examination.

PHYSIOLOGY

School of Medicine

FACULTY

Allan W. Jones, professor, chairperson, PhD, University of Pennsylvania
Douglas M. Griggs Jr., professor, director of graduate studies, MD, University of Virginia
Don H. Blount, graduate dean and vice provost for research, professor, PhD, University of Missouri-Columbia
James O. Davis, professor emeritus, MD, Washington University (St. Louis), PhD, University of Missouri-Columbia University
E. Lee Forker, professor, MD, University of Pittsburgh
Dean Franklin, professor, director, Dalton Research Center
Ricardo Martinez, professor, MD, Tulane University
Dallas K. Meyer, professor emeritus, PhD, University of Missouri-Columbia
Wesley S. Platner, professor emeritus, PhD, University of Missouri-Columbia
Donald H. York, professor, PhD, Monash University (Australia)
Marvin L. Zatzman, professor, PhD, Ohio State University
Ronald H. Freeman, associate professor, PhD, University of Indiana
J. Alan Johnson, associate professor, PhD, University of Indiana
Ferrill A. Purdy, associate professor, AM, University of Missouri-Columbia
Michael J. Rovetto, associate professor, PhD, University of Virginia
Travis E. Solomon, associate professor, MD, PhD, Texas
Virginia H. Huxley, assistant professor, PhD, University of Virginia

GRADUATE DEGREES OFFERED

MA in physiology (medicine)

PhD in physiology (medicine)

COOPERATE DEGREES

MD/MA in physiology (medicine)

INTERDISCIPLINARY AREA

PROGRAM

PhD in physiology area program

The Department of Physiology provides interdisciplinary graduate programs leading to the degrees of doctor of philosophy and in special cases master of arts. These programs use the Departments of Anatomy, Biochemistry, Biological Sciences, Microbiology and Psychology and the Colleges of Agriculture, Veterinary Medicine and Engineering for support in giving students of physiology a breadth of knowledge.

The master of arts program is designed to give the students an in-depth exposure to mammalian physiology and cog-

nate fields. It provides experience in experimental design of physiological research and in research itself. This degree may serve as an introduction to advanced biological studies for the student interested in moving from the physical sciences into biophysics or bioengineering. In exceptional cases an MA in physiology may be obtained concurrently with work toward the MD degree. Students who choose a career of teaching and research may pursue, with permission of the staff, a PhD program without taking a master's degree.

The PhD program is designed to prepare the candidate for a career in research and/or teaching. The culmination of this program is the completion of a meritorious and original research project, writing a dissertation on the research and the defense of this dissertation before a graduate committee. It is strongly recommended that the candidate's academic education be furthered with two or more years of postdoctoral training. Postdoctoral fellows also contribute to the education of degree candidates. All PhD candidates, regardless of their source of support, are required to participate in the laboratory or lecture instruction of Physiology 201, Elements of Physiology or Physiology 250, Medical Physiology at some time during the graduate program.

The program emphasizes mammalian physiology. Advanced study in this field is directed to the discovery and understanding of basic physiological mechanisms in higher organisms, with application to medicine, veterinary medicine, agriculture and related studies.

Departmental areas of specialization within the field of mammalian physiology are in neurological, renal, cardiovascular, endocrine, gastrointestinal and environmental physiology. These areas are reflected by the research interests of the department.

Research problems under active investigation are the renin-angiotensin mechanisms, mechanisms of hypertension, control of coronary circulation, cardiac metabolism, ion transport in smooth muscle, adenosine metabolism, physiological functions in the hibernating animal, synaptic transmission, pancreatic and liver function and capillary transport.

Departmental members maintain research laboratories on the fourth floor of the Medical Sciences Building, in the Truman Veterans Hospital and in the Dalton Research Center. The laboratories, among the best equipped physiological laboratories in the state, have a wide range of sophisticated physiological instrumentation for the gathering of quantitative physiological data at both the chemical and physical levels. These laboratories are equipped for physiological research on large and small mammals as well as isolated tissues. Equipment includes electronic recording equipment, scintillation counters, atomic absorption spectrometer, autoanalyzers, high perfor-

mance liquid chromatography, analog and digital computers, recording spectrophotometers, environmental chambers and other equipment for accurate analysis of chemical and physical properties of living organisms. Also available on the UMC campus are the general service facilities such as animal care facilities, the nuclear reactor, the nuclear magnetic resonance spectroscopy facility and the computer center.

The medical library's extensive scientific collection, available to students and staff, is supplemented by a small but conveniently located departmental library.

Financial support for qualified graduate students is available from a number of sources. The department has a cardiovascular training grant which supports two graduate students and four postdoctoral fellows. There are five graduate teaching assistantships. In addition, a number of students are supported by staff research grants. Information on entrance to the graduate program in physiology and the sources of financial support may be obtained from the department chairperson.

MASTER'S DEGREE

Selection of students is based on a combination of the following criteria:

- (1) Undergraduate work is evaluated in detail, as well as from the standpoint of required overall GPA of 3.0 (A = 4.0) or higher.
- (2) Each applicant must complete the department's application blank and submit three letters of recommendation from senior professors.
- (3) Each applicant must have taken part I and part II of the GRE within the past four years and the transcript of test scores must be sent directly to the department by the Education Testing Service. The applicant must score in the upper fiftieth percentile on Part I (general aptitude test) and must take the advanced test in one or more of the following subjects: biology, chemistry, engineering, mathematics, physics or psychology.
- (4) The following courses are required prior to entrance into the graduate program, although a superior student lacking some of these courses may take them while pursuing the master's degree: a college major or minor in biology, chemistry, engineering, psychology or related fields; biology--general biology, cell biology, zoology; chemistry--inorganic, qualitative, quantitative and physical chemistry and organic chemistry through aromatic compounds; physics--one year of college physics; and mathematics--college mathematics through calculus.

There is no language requirement for the master's degree. The minimum course requirements are 30 hours of graduate

credit; 15 or more must be in 400-level courses and not more than 12 may be in research.

The typical candidate for the MA in physiology must take Physiology 305 (10 hours), biochemistry (5 hours), statistics (3 hours) and other courses that the advisor designates as necessary to give breadth to the program or to remedy admissions in the undergraduate curriculum. The program, of necessity, frequently exceeds the minimum 30 hours and B (3.0) or better average must be maintained. The candidate must submit a thesis and defend it in an oral examination.

DOCTORAL DEGREE

The entrance requirements are the same as items 1, 2 and 3 in the MA program. In addition, the applicant is required to pass written and oral qualifying examinations administered by members of the physiology faculty during the first year of the PhD program.

Three years of residence are required which is equivalent to about 88 semester hours of credit.

The candidate must fulfill the following degree requirements (1) complete the program of study approved by the candidate's planning committee; (2) demonstrate by examination a reading knowledge of two foreign languages (9 credit hours in a collateral field may be substituted for each foreign language); (3) pass a comprehensive examination in mammalian physiology and related fields deemed essential by the examining committee; and (4) complete a meritorious, original piece of research for the dissertation.

PHYSIOLOGY AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section of FIELDS OF STUDY in this catalog.

PLANT PATHOLOGY College of Agriculture

FACULTY

- Steven G. Pueppke, professor, chairperson, PhD, Cornell University
Om P. Sehgal, professor, director of graduate studies, PhD, University of Wisconsin
Merton F. Brown Jr., professor, PhD, University of Iowa
Oscar H. Calvert, professor, PhD, University of Wisconsin
Victor H. Dropkin, professor, PhD, University of Chicago
Robert N. Goodman, professor, PhD, University of Missouri-Columbia
William Q. Loegering, professor Emeritus, PhD, University of Minnesota
Daniel F. Millikan, professor, PhD, University of Missouri-Columbia
Anton Novacky, professor, PhD, Czechoslovak Academy of Sciences
Einar W. Palm, professor, PhD, North Dakota State University
Jack R. Wallin, professor, PhD, Iowa State University
Thomas D. Wyllie, professor, PhD, University of Minnesota
Arnold Foudin, associate professor, PhD, University of Georgia, U.S.D.A., APHIS

Arthur L. Karr Jr., associate professor, PhD, University of Colorado

A. Wrather, assistant professor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MS in plant pathology INTERDISCIPLINARY AREA PROGRAM:

PhD in pathology area program

The Department of Plant Pathology, College of Agriculture, offers graduate work leading to the master of science degree. The department also cooperates with the Department of Pathology of the School of Medicine and the Department of Veterinary Pathology, College of Veterinary Medicine, in offering an area PhD program in pathology. Information on that program is presented in the section on area programs in this catalog.

The following areas of concentration in plant pathology are offered: ultrastructure research bearing on host-plant pathogen interactions, phytobacteriology, intermediary metabolism of plant pathogenic fungi, ecology of soil-borne plant pathogenic fungi, plant pathogenic viruses, fruit pathology, clinical plant pathology and plant nematology.

Stipends are available from the Agricultural Experiment Station, USDA-SEA and industry funds. For information and application forms, write the director of graduate studies, Department of Plant Pathology.

Plant pathology also cooperates with the Departments of Agronomy, Entomology and Horticulture in offering a curriculum in plant pest management. This curriculum is designed to prepare professionals for fields related to protection of the plant and its environment.

MASTER'S DEGREE

For admission to the MS program, an applicant should have a BS degree with at least a 3.0 GPA (A = 4.0) and at least 15 hours of biological sciences in undergraduate work.

There is no language requirement. A cumulative GPA of 3.0 or better is required, with no more than two grades of C or lower allowed during the study period for the MS degree.

POLITICAL SCIENCE College of Arts and Sciences

FACULTY

Paul Wallace, professor, chairperson, PhD, University of California-Berkeley

David M. Wood, professor, director of graduate education, PhD, University of Illinois

Ronald F. Bunn, provost, professor, PhD, Duke University

Soon Sung Cho, professor, PhD, University of Michigan

Wayne L. Francis, professor, PhD, University of Indiana

Arthur L. Kalleberg, professor, PhD, University of Minnesota

David A. Leuthold, professor, PhD, University of California-Berkeley

C. Peter Magrath, president, professor, PhD, Cornell University

Robin A. Remington, professor, PhD, University of Indiana

Frederick C. Spiegel, professor, PhD, University of Illinois

Richard A. Watson, professor, PhD, University of Michigan

Dean L. Yarwood, professor, PhD, University of Illinois

Gregory Casey, associate professor, PhD, Georgetown University

Richard R. Dohm, associate professor, PhD, University of Minnesota

Richard Hardy, associate professor, PhD, University of Iowa

N. Patrick Peritore, associate professor, PhD, University of California-Santa Barbara

Marvin Rogers, associate professor, PhD, University of California-Berkeley

Herbert K. Tillema, associate professor, PhD, Harvard University

Sandra Schneider, assistant professor, PhD, SUNY-Binghamton

GRADUATE DEGREES OFFERED

MA in political science

MA in political science with an emphasis in public policy

PhD in political science

The Department of Political Science offers graduate work leading to the degrees of master of arts, master of arts with public policy emphasis, and a doctor of philosophy. MA graduates hold management positions in both the public service and private enterprise, and many have gone on to study for the PhD. Alumni with PhDs have received teaching appointments at public and private colleges as well as positions of responsibility in state and national government, and in many foreign countries. In recent years, an average of five students per year entered the PhD job market, and almost all who have completed their degree have found positions. Eighty percent of the PhD graduates in the last five years became college teachers, with 20 percent going into the public service. Six departmental alumni have become college presidents. The department emphasizes top quality teaching, and several of its faculty have received awards and prizes for teaching excellence. It also strives to develop research skills and active scholarship in its students. Departmental alumni have written more than 30 books.

The department aims to train people as experts in governmental knowledge, 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. The MA degree is intended to prepare students for teaching at the junior college level, to serve as a stepping stone toward candidacy for the doctoral degree, or to develop skills in policy analysis to meet qualifications for positions in public service at the national, state or local levels.

Through the department's membership in the Inter-University Consortium of Political and Social Research, political science graduate students are eligible for summer training in quantitative analysis and research design at the University of Michigan. Courses in public opinion, policy analysis and decision making provide students with experience in research

design, data analysis and computer applications. Field experience in survey work is possible under auspices of the department's survey research laboratory, which conducts state and local surveys. Membership in the American Institute of Indian Studies assists advanced language training and field research in India, and complements UMC's South Asia Program. Other international opportunities are available through University membership in the Universities Field Staff International.

Students may apply for departmental fellowships and teaching and research assistantships, as well as University fellowships and scholarships. Applicants for University fellowships must submit GRE scores to the department. About 24 departmental assistantships offer stipends ranging from \$2,500 to \$5,100 per year. For application blanks for research and teaching assistantships and fellowships, and for additional information on the department's graduate program, write to the director of graduate education in the political science department.

DEGREE REQUIREMENTS

For admission to graduate study in political science an applicant should have an undergraduate major in political science, or at least six hours of upper-level course work in political science. A major in another area may be acceptable, but each case is judged on its own merits. An applicant must have an overall undergraduate GPA of at least 3.0, as well as a 3.0 in political science courses (A = 4.0). Applicants should take the GRE and have the results reported to the department's director of graduate studies at the time of applying for admission. Those finding it impossible to comply with this requirement must take the GRE as soon after applying as possible, but no later than during the first semester in residence at UMC.

MASTER'S DEGREE

The master of arts degree may be earned by completing either a thesis or non-thesis program. The thesis program requires 24 hours of course work (at least eight in 400-level courses) and an acceptable thesis. The non-thesis program can take two forms: a 30-hour generalist master of arts, or a master of arts with public policy emphasis for a maximum of 48 hours of academic credit. The latter master's degree is designed expressly for people planning on careers in the public service, while the generalist MA can serve multiple career goals: teaching, continuation of studies to the PhD or entrance into the public service as well. Students wishing to advance from the non-thesis master's program to the PhD program must take 24 hours of course work and write a master's paper (for which six hours of credit is given). The generalist MA imposes no specific course requirements, but each candidate must take an upper-level course in six of the

seven fields of political science: comparative government, international affairs, political theory, politics and legislation, public administration, public law and public policy. The MA with public policy emphasis carries a core curriculum with some elective courses. All master's degree programs culminate in a comprehensive oral examination. An MA candidate must maintain a B or higher average; the candidacy will be terminated for more than six hours of C in political science courses.

DOCTORAL DEGREE

Acceptance to PhD candidacy is determined by a committee's consideration of the applicant's performance on the GRE, academic record, and letters of recommendation. Although permitted flexibility in planning, students must offer PhD programs that include at least 48 hours of graduate work. At the option of the student's advisory committee, up to 24 hours of the MA program may be included in the PhD program. Such a program shall include at least 36 hours distributed among four of the seven fields of political science, plus at least 6 hours in an outside field or combination of fields. In addition to completing the necessary course work, the candidate must demonstrate the capacity to use a research tool associated with another academic discipline (e.g., a foreign language or statistics), must obtain some teaching experience in political science, must pass a written and oral comprehensive examination and must submit and defend a dissertation.

PRACTICAL ARTS AND VOCATIONAL-TECHNICAL EDUCATION

College of Education

FACULTY

Richard C. Erickson, chairperson, professor, PhD, Purdue University
Bob R. Stewart, director of graduate studies, EdD, University of Maryland
Michael Dyrenfurth, professor, PhD, Bowling Green State University
John E. Elias, professor, EdD, University of Nebraska
Franklin J. King, professor, EdD, University of Missouri-Columbia
E. M. Miller, professor, EdD, University of Missouri-Columbia
Wilber R. Miller, professor, EdD, University of Missouri-Columbia
Donald D. Osburn, professor, PhD, University of North Carolina
Curtis R. Weston, professor, EdD, University of Missouri-Columbia
R. Jo Behymer, associate professor, EdD, University of Missouri-Columbia
Lonnie Echernacht, associate professor, EdD, University of Missouri-Columbia
Richard Linhardt, associate professor, PhD, University of Missouri-Columbia
Betty B. Martin, associate professor, PhD, University of Missouri-Columbia
Robert J. Birkenholz, assistant professor, PhD, Iowa State University
Joan Quilling, assistant professor, PhD, Michigan State University
Clifton Smith, assistant professor, PhD, Virginia Polytechnic Institute
Lynda L. West, assistant professor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MEd in practical arts and vocational-technical education with the following emphasis areas: agricultural education, business and office education, marketing education, home economic education, industrial education or vocational-technical education

EdSp in practical arts and vocational-technical education with the following emphasis areas: agricultural education, business and office education, marketing education, home economics education, industrial education or vocational-technical education

EdD or PhD in practical arts and vocational-technical education with the following emphasis areas: agricultural education, business and office education, marketing education, home economics education, industrial education, technology teaching or vocational-technical education

The Department of Practical Arts and Vocational-Technical Education offers graduate programs in agriculture education, business education, marketing education, home economics education and industrial education as well as a comprehensive program in vocational education. The comprehensive program provides an opportunity for professional study and advancement for persons interested in leadership positions which cut across the traditional program areas of vocational education. Majors in the Department of Practical Arts and Vocational-Technical Education can elect an area of concentration in administration, curriculum development, research or vocational education for special needs students. Concentration areas in disciplines outside of professional education, such as economics, management, and sociology may also be chosen.

See *Education* in this section for general information. Additional information may be obtained from the director of graduate studies, Department of Practical Arts and Vocational-Technical Education, 435 GCB.

PSYCHOLOGY

College of Arts and Sciences

FACULTY

Harris Cooper, associate professor, director of graduate studies, PhD, University of Connecticut
Wayne P. Anderson, professor, PhD, University of Missouri-Columbia
Bruce Biddle, professor, PhD, University of Michigan
Sam C. Brown, professor, PhD, University of Virginia
June E. Chance, professor, PhD, Ohio State University
Robert Dolliver, professor, PhD, Ohio State University
Russell Geen, professor, PhD, University of Wisconsin
Alvin G. Goldstein, professor, PhD, Clark University
Theodore F. Henrichs, professor, PhD, University of North Carolina
Donald H. Kausler, professor, PhD, Washington University (St. Louis)
Charles J. Krauskopf, professor, PhD, Ohio State University
David G. McDonald, professor, PhD, Washington University, (St. Louis)
John H. Mueller, professor, PhD, St. Louis University

Mark H. Thelen, professor, PhD, Michigan State University

Joseph Thorpe, professor, PhD, University of Texas
Barbara Uehling, chancellor, professor, PhD, Northwestern University

William M. Beneke, adjunct professor, PhD, University of New Mexico

Robert S. Daniel, professor emeritus, PhD, University of Indiana

Melvin H. Marx, research professor emeritus, PhD, Washington University (St. Louis)

Douglas G. Anger, associate professor, PhD, Harvard University

Robert M. Arkin, associate professor, PhD, Southern California University

Puncy Paul Heppner, associate professor, PhD, University of Nebraska

Lizette Peterson-Homer, associate professor, PhD, University of Utah

Marjorie Marlin, associate professor, PhD, University of Illinois

Richard E. Petty, associate professor, PhD, Ohio State

Timothy A. Salthouse, associate professor, PhD, University of Michigan

David T. Vernon, associate professor, PhD, University of Chicago

Dennis Wright, associate professor, PhD, University of California

Niels C. Beck, adjunct assistant professor, PhD, St. Louis University

Charles M. Borduin, assistant professor, PhD, Memphis State University

Charles H. Brown, assistant professor, PhD, University of Michigan

Thomas M. Di Lorenzo, assistant professor, PhD, West Virginia University

Kenneth J. Sher, assistant professor, PhD, University of Indiana

Robert G. Frank, adjunct assistant professor, PhD, University of New Mexico

Vannie Kay Hodges, adjunct assistant professor, PhD, University of Maryland

Andrew L. Homer, adjunct assistant professor, PhD, University of Utah

Frederick vom Saal, adjunct assistant professor, PhD, Rutgers University

Ruth E. Wright, adjunct assistant professor, PhD, University of Missouri-Columbia

Kathy Anger, lecturer, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MA in psychology with an emphasis area in clinical psychology

MA in psychology with an emphasis area in counseling psychology

MS in psychology with an emphasis area in counseling psychology

MS in psychology with an emphasis area in teaching of psychology

MA in psychology with an emphasis area in general experimental psychology

MA in psychology with an emphasis area in social psychology

PhD in psychology with an emphasis area in clinical psychology

PhD in psychology with an emphasis area in counseling psychology

PhD in psychology with an emphasis area in general experimental psychology

PhD in psychology with an emphasis area in social psychology

The Department of Psychology offers a broad choice of advanced degree programs. The master of arts and doctor of philosophy degrees are offered in general experimental psychology, clinical psychology, counseling psychology and social psychology. The master of science degree is offered in conjunction with the Department of Educational and Counsel-

ing Psychology in the field of counseling techniques

Financial aid is available through departmental research and teaching assistantships and from college and Graduate School fellowships. Federal agency funds such as U.S. Public Health Service Traineeships in clinical psychology are available to qualified graduate students.

Experimental Psychology. A strong foundation in experimental methodology is of fundamental importance to all graduate training. The program is designed to give the student a thorough background in statistics, scientific methodology and content courses. A number of faculty research programs are supported by grants which provide stipends and training opportunities for students.

The PhD program in experimental psychology includes approximately 30 semester hours in research. The primary objective of the experimental program is to give the student a thorough substantive and methodological foundation in experimental psychology. The PhD program emphasizes student research and collaboration in faculty research in the areas of learning, gerontology, perception, physiological psychology and motivation.

In the Melvin H. Marx Psychology Animal Research Laboratory, the Department maintains a variety of equipment for the study of animal learning, motivation, comparative behavior and physiological correlates of behavior. A fully-equipped laboratory for the study of the electroencephalogram and muscle action potentials is available for use in McAlester Hall, and a similarly-equipped mobile unit is used for more extensive studies at schools and institutions in the surrounding area. McAlester Hall also has laboratories equipped for studies in human learning and memory, visual and auditory perception, and experimental-social psychology.

Clinical Psychology. The clinical psychology program, approved by the American Psychological Association, is coordinated by a director and a committee made up of staff members specializing in this area. The philosophy of training is to achieve a balance between scientific and service activities. The program prepares students for teaching, research and service in universities, clinics, hospitals and similar agencies. In addition to the research emphasis and training in basic areas of psychology (which characterize all of the programs in the department), clinical students obtain training in behavior theory and dynamics and in techniques of assessment and behavior change. Supervised experience is provided through practicum courses in the department's psychological Clinic and, by arrangement through the department, paid clerkships and internships in campus and other cooperating institutions such as Fulton State Hospital and the Mid-Missouri Mental Health Center.

Counseling Psychology. The program in counseling psychology is accredited by the American Psychological Association and is offered in conjunction with the Department of Educational and Counseling Psychology. It is designed to train psychologists for work in universities, the Veterans Administration and public or private agencies. Program emphasis is on research and a strong basic foundation in general behavior theory, followed by intensive training in supervised practicums and internships. Facilities for the latter part of the program are provided by local agencies (e.g., the UMC Counseling Services), state and federal agencies and the Veterans Administration.

Social Psychology. The program in social psychology is offered in conjunction with the Department of Sociology. Like the other PhD programs of the psychology department, it has a strong research emphasis. The goal is to provide thorough preparation for careers in research, teaching and the service functions of social psychology. Some of the specialized course work may begin in the first year, with concentrated seminars and other courses coming in the second and third years. Emphasis is given to personality theory, behavior dynamics, role theory, small group theory, environmental psychology and other aspects of this rapidly developing area of social psychology. In addition to the general research training in the department, there are opportunities for research experience in the Center for Research in Social Behavior.

Dual PhD - MBA Program in Psychology. The dual degree program is designed for students who desire preparation for applied research careers in business, government or consulting. At the same time, the program provides the depth and breadth of expertise in research methodology, psychology and business applications needed by persons who wish to pursue academic careers in psychology or in business administration. The program uniquely combines graduate training in rigorous research design and basic theories of human behavior offered by the psychology department, with training in managerial skills and applied problem-solving offered by the College of Business and Public Administration.

These programs and others are more fully described in brochures available from the department chairperson.

DEGREE REQUIREMENTS

Applicants for advanced degrees in psychology must complete application forms obtainable from the department. There are no rigid requirements, but most students accepted have an undergraduate major in psychology or its equivalent. Acceptance is based on training, quality of work, recommendations, GRE and Miller Analogies Test scores and other information. For additional information on admission requirements, interested persons are encouraged to consult the

book, Graduate Study in Psychology and Associated Fields, published annually by the American Psychological Association, and available in most libraries. Missouri follows national' deadlines in accepting and acting on applications.

MASTER'S DEGREE

Graduate students not accepted by the department may not take psychology courses at the 400 level without consent of the instructor.

MASTER'S DEGREE, THESIS OPTION

Degree requirements for the MA consist of 30 hours of course work, including 6-8 hours of research credit for an experimental thesis in publishable form. An oral examination on the thesis is required.

MASTER'S DEGREE, NON-THESIS OPTION

MS degree requirements are 40 hours, including 3-6 hours in Psychology 400 or 450 (non-thesis research) and a practicum. Also required is a special investigation (experimental or scholarly) submitted in written form to the student's committee, which subsequently conducts an oral examination on the report.

DOCTORAL DEGREE

The PhD qualifying examination requirement is satisfied by successful completion of the department's core curriculum. In addition, a master's degree with an empirical thesis is required for admission to doctoral study. Those entering the department with a master's degree obtained without an empirical thesis may meet the latter requirement by conducting an investigation under the supervision of their adviser.

General requirements for the PhD include 15 hours of core curriculum courses, three courses in statistics, 1 hour of staff proseminar, a selection of courses both within and without the main area of concentration, and research. Practicum and certain other courses are required for the counseling and clinical programs.

Other requirements are one year of full-time, paid professional experience (or equivalent), a major review paper, a dissertation, and comprehensive and final oral examinations.

PUBLIC ADMINISTRATION College of Business and Public Administration

FACULTY

Edward T. Jennings Jr., associate professor, chairperson and director of graduate studies, PhD, Washington University (St. Louis)

Stanley B. Botner, associate professor, PhD, University of Missouri-Columbia

Robert B. Denhardt, research professor, PhD, University of Kentucky

Robert E. Karsch, professor emeritus, PhD, University of Missouri-Columbia

Robert W. Paterson, professor emeritus, PhD, University of Virginia

Michael Diamond, assistant professor, PhD, University of Maryland

Michael Sabath, assistant professor, PhD, University of Pittsburgh

Jay D. White, assistant professor, PhD, George Washington University

GRADUATE DEGREES OFFERED

MPA in public administration

COOPERATIVE DUAL DEGREE

MPA and MS in public health with an emphasis area in health services management

The Department of Public Administration of the College of Business and Public Administration offers the master of public administration degree as full academic preparation for administrative careers in local, state and national governments and other public agencies. The two-year professional program is open to students holding baccalaureate degrees from accredited institutions and meeting admission standards of the Graduate School.

MASTER'S DEGREE

The first year of the MPA program emphasizes applications of behavioral, social and decision sciences to problems that confront administrators in the public sector. The second year concentrates on the institutional, political and behavioral aspects of public decision making and on systematic approaches to policy analysis and governmental problem solving.

Consisting of 48 hours of graduate work, the MPA program includes a public administration core (24 hours), area of specialization (9 hours), electives (9 hours) and internship (6 hours). After admission to the MPA program, students who have deficiencies in their undergraduate work may be required to take courses for no credit toward the degree.

A summer internship between the first and second years of study provides the students with work/training experience in the administration of a major policy or program. Internships may be arranged with local, state or federal governmental agencies and with other non-profit organizations of a public nature.

For further information write to the director of graduate studies, Department of Public Administration, College of Business & Public Administration, 315 Middlebush Hall, UMC, Columbia, Mo. 65211.

RECREATION & PARK ADMINISTRATION

College of Public and Community Services

FACULTY

Gerald L. Hitzhusen, assistant professor, chairperson, MS, University of Missouri-Columbia

Jaclyn Card, assistant professor, director of graduate studies, PhD, University of Utah

Glenn A. Gillespie, professor, associate dean, College of Public and Community Services, PhD, University of Missouri-Columbia

Keith B. Roys, professor, PhD, University of Illinois

Hardeep S. Bhullar, associate professor, PhD, University of Georgia

Steven C. Lamphear, associate professor, PhD, University of Georgia

C. Randall Vessell, associate professor, PhD, University of Iowa

Glenn D. Weaver, associate professor, MS, University of Missouri-Columbia

Marshall L.R. Masek, assistant professor, MS, University of Missouri-Columbia

David J. Szymanski, assistant professor, MA, College of St. Rose

David W. Ostlund, Lecturer, MS, Central Missouri State University

GRADUATE DEGREES OFFERED

MS in recreation and park administration

MS in recreation and park administration with an emphasis area in youth agency administration

The accredited program of the Department of Recreation and Park Administration offers graduate work leading to a master of science degree.

The purpose of the Department of Recreation and Park Administration's graduate program is to promote the acquisition of advanced professional skills and knowledge on the part of the student, and to foster within the student a self-commitment toward excellence in scholarly inquiry, with the primary aim of developing a professionally competent practitioner for a decision-making position within the leisure service profession. Area of specialization are available in administration, tourism, outdoor resource based recreation and therapeutic recreation.

MASTER'S DEGREE

To be admitted to the master's program, a student should have a baccalaureate degree with a major in recreation and park administration (or the equivalent). If the student's undergraduate degree is in another area, deficient courses may be necessary. The student should have a solid undergraduate foundation in the humanities, the social and behavioral sciences, and/or the physical/biological sciences. The GRE is required for admission into the program.

A minimum of 36 hours is required for graduation. Additional requirements include: 9-12 hours in recreation and park administration theory, 6 hours of technical skills, 6 hours of research application, 12 hours of specialization, and 1 hour of comprehensive examination. A minimum of 20 hours at the 400 level is also required. Continuous enrollment in RPA 490 for one credit hour per semester is a requirement until graduation if the student is not enrolled in other courses.

REGIONAL SCIENCE AREA PROGRAM

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

ROMANCE LANGUAGES

College of Arts and Sciences

FACULTY

Margaret P. Sommers, associate professor (French), chairperson, PhD, Stanford University

Vern G. Williamsen, professor (Spanish), associate chairperson, PhD, University of Missouri-Columbia

Daniel E. Gulstad, professor (Spanish and linguistics), director of graduate studies, PhD, University of Illinois

Ebion de Lima, professor (Portuguese), PhD Catholic University of Sao

Paulo Howard Mancing, professor (Spanish), PhD, University of Florida

M. Bonner Mitchell, professor (French and Italian), PhD, Ohio State University

Edward J. Mullen, professor (Spanish), PhD, Northwestern University

Margaret S. Peden, professor (Spanish), Catherine P. Middlebush Chair, PhD, University of Missouri-Columbia

O. Allen Thiher, professor (French), PhD, University of Wisconsin-Madison

Benjamin L. Honeycutt, associate professor (French), PhD, Ohio State University

Donna Kuizenga, associate professor (French), PhD, City University of New York

Daniel C. Scroggins, associate professor (Spanish), PhD, University of Michigan

James Wallace, associate professor (French), PhD, Vanderbilt University

Rene A. Campos, assistant professor (Spanish), PhD, New York University

Richard K. Dixon, assistant professor (French), PhD, Colorado State University

Magdalena Garcia-Pinto, assistant professor (Spanish), PhD, University of Texas-Austin

Mary Jo Muratore, assistant professor, (French), PhD, University of California-Davis

Michael Ugarte, assistant professor (Spanish), PhD, Cornell University

GRADUATE DEGREES OFFERED

MA in Spanish

MA in French

PhD in Romance Languages

The Department of Romance Languages offers programs of study leading to master of arts degree in French or Spanish, and doctor of philosophy in romance languages with primary specializations in French literature, Peninsular Spanish literature or Spanish American literature. A person interested in working for any one of these degrees should request an application from the director of graduate studies of romance languages. The application should be accompanied by a transcript of all completed undergraduate and graduate work and GRE scores on both the aptitude and the advanced French or Spanish examinations. If accepted by the department, the student is then notified to apply for admission to the Graduate School through the admissions office, 130 Jesse Hall.

Part-time teaching assistantships are available to departmental graduate students. A student should indicate interest in being considered for one of these appointments in the initial letter to the director of graduate studies and on the application form.

Candidates for an advanced degree (except native speakers of French or Spanish) are given a language proficiency examination at the time of entrance to determine their ability to speak, understand, read and write their language specialization. Students deficient in the ability to speak and understand are required to register for 209 Advanced Conversation; if deficient in writing ability, they must register for 206 Advanced Composition.

MASTER'S DEGREE (FRENCH OR SPANISH)

The student may take work wholly in Spanish, or may elect a minor

in one of the following fields of study: for a major in French--Spanish, Italian, Portuguese, German, Russian, Latin, English, art history, philosophy, European history, linguistics, education; for a major in Spanish--French, Italian, Portuguese, German, Russian, Latin, English, linguistics, Latin American history, European history, art history, philosophy, education. Other minor fields may be selected subject to departmental approval.

A total of 30 hours selected from courses receiving graduate credit must be completed. In a major-minor combination, a minimum of 20 hours must be in the major subject and a minimum of 10 hours in the minor field. At least 15 hours must be in courses numbered 400 or above. No more than 12 hours credit is allowed for research, problems and special readings (courses 409, 400 and 350). A course in the history of the language (French 311 or Spanish 361) must be included in the study program. Students with fewer than five courses (normally 15 hours) at the undergraduate level in literature in their major fields must make up these deficiencies.

A thesis is optional; however, students who plan to work for the doctorate are encouraged to write one. The thesis counts for six hours toward the 30-hour requirement.

Candidates for the master of arts degree are required to pass a 6-hour written examination based on the MA reading list. Copies of the list are available in the departmental office, 27 Arts & Science Building. This examination is given in October and March. Two failures on the final examination eliminates the candidate from consideration for the MA degree. If an official minor is offered, the candidate is examined in both the major and minor fields.

DOCTORAL DEGREE (ROMANCE LANGUAGES)

The department offers primary specialization for the doctorate in the following major fields: French language and literature, Spanish language and literature, and Spanish American literature. Candidates select secondary fields from the following list.

Majors in French language and literature may select from any other foreign language and literature acceptable to the department, or general linguistics.

Majors in Spanish language and literature may select from Spanish-American literature and any other foreign language and literature acceptable to the department, or Spanish-American literature and any general linguistics.

Majors in Spanish-American literature may select from Spanish literature and any other foreign language and literature acceptable to the department, or Spanish literature and general linguistics.

Secondary fields involving course work in other departments are also available in Medieval studies or Renaissance studies.

All prospective PhD candidates are required to take the qualifying examination to determine their fitness for doctoral study. Doctoral students who hold the MA from this department may be excused from the qualifying examination if their performance on the MA final examination is judged outstanding by the examining committee.

The qualifying examination is given in November to doctoral students with the MA who enter the department in August, in March for those who enter in February, in October for those who enter in June. For doctoral students without an MA, the examination is given in February to those entering the department in August; in October to those entering in February; in November to those entering in June.

The examination is oral, normally does not exceed one hour in length and is designed to reveal a student's knowledge of the major field, acquaintance with related fields, oral proficiency in the major languages and general acumen. If the committee is satisfied with the examination, they will consider the student's program of study. If the performance is judged unsatisfactory, the student may repeat the examination at the end of the academic year. The second examination may be, in part, written. Failure on a second examination terminates doctoral study in this department. However in the case of a student with only a bachelor's degree, failure does not prevent candidacy for a master's degree.

Before being admitted to the comprehensive examination, a candidate must show satisfactory ability to read two foreign languages other than the major language. The advisory committee determines which two languages are required. Of the two, normally one of them is the language of the secondary field--French-Italian, Portuguese or Spanish; the other language may be another one of the four or German or Russian.

A student beginning doctoral work must satisfy the departmental Latin requirement as a prerequisite to enrolling in French 411 (Old French) or Spanish 460 (Old Spanish). The Latin requirement must be fulfilled by the end of the first year of graduate study. A candidate for the doctorate in French is required to have some formal training in Old French; a candidate for the doctorate in Spanish must have some formal training in Old Spanish. This requirement must be fulfilled by the end of the second year.

A student teaching 5-7 hours as an assistant in the department may take 12-14 hours of course work and count one semester of residence requirement for the year's work; for 8-11 hours teaching, 9-11 hours course work and 3/4 semester; for 12-15 hours teaching, 6-8 hours course work and 1/2 semester.

The comprehensive examination is composed of an oral and a written section. The written examination consists of four 3-hour examinations, at least one of

which must be written in the language of specialization. Should these written examinations be judged of sufficiently high quality in content, organization and language, the candidate is admitted to the oral section, at least part of which is conducted in the candidate's language of specialization.

The final examination is oral and open to the public, and is largely but not exclusively, a defense of the dissertation.

GENERAL LINGUISTICS AS A SECONDARY FIELD

A student with no previous training in general linguistics is expected to complete at least 15 hours of work in the field. Additional work in fields other than those mentioned above (e.g. history, philosophy, etc.) may be recommended if the candidate's advisory committee feels such courses are essential to round out the student's preparation.

Before the end of the second year in residence, the candidate is expected to demonstrate proficiency (speaking, reading, writing) in French and Spanish. In addition, the candidate must have a good reading knowledge of Latin and of at least one of the following: German, Italian, Portuguese, Russian or some other language (which need not be of Indo-European origin) acceptable to the advisory committee and the Graduate School. The two languages used to meet the departmental language reading requirement may be among those used to fulfill this proficiency requirement.

SOCIAL WORK College of Public and Community Services

FACULTY

Roland G. Meinert, professor, director, PhD, St. Louis University

Joanne Mermelstein, associate professor, director of graduate studies, MSSW, University of Missouri-Columbia

Elizabeth A. Dubansky, associate professor, director of undergraduate studies, MSW., Washington University (St. Louis)

Michael Kelly, associate professor, coordinator of social work extension, PhD, University of Texas - Austin

Jannah Hurn, assistant professor, coordinator of field instruction, PhD, University of Illinois

Judith P. Burke, associate professor, PhD, Bryn Mawr
Vincent Faherty, associate professor, DSW, University of Utah

O. Duane Kroeker, associate professor, MSW, University of Pennsylvania

Marilyn E. Maddux, associate professor, MSW, Washington University (St. Louis)

Paul A. Sundet, associate professor, MSSW, University of Missouri-Columbia

Howard Karger, assistant professor, PhD, University of Illinois

Larry W. Kreuger, assistant professor, PhD, St. Louis University

Erma McMurry, assistant professor, MSW, University of Nebraska

GRADUATE DEGREE OFFERED

MSW in social work

MASTER'S DEGREE

The master of social work degree program is designed to prepare the student

for leadership in professional social work practice. The program is fully accredited by the Council on Social Work Education, of which the school is a charter member.

Preparation for professional leadership encompasses two major components: (1) an in-depth understanding of social science knowledge and an ability to apply behavioral skills of the generic core of social work practice, and (2) an individualized configuration of specific roles and contexts which enable the student to specialize in an area of social work practice.

The graduate curriculum is organized to use the varied scientific and interdisciplinary sources of knowledge required for social work practice. It focuses on preparing students for leadership through two areas of concentration, which include both a service function and a field of practice. The two service functions offered are advanced clinical practice and planning and administration, e.g., supervision, consultation, administration, planning and staff development. The two fields of practice currently offered are family (including aging) and children's services and health services (including mental and physical). Decisions regarding concentrations are made by students in close consultation with faculty advisers. Elective courses, block field instruction and independent study are related to the area of concentration.

The first year of study is based on a generalist conception of social work practice, whereby the social worker, within the framework of professional values and scientific problems assessment, differentially intervenes to produce legitimate social change. During the first semester, major attention is given to the acquisition and development of foundation knowledge and behavioral skills, including basic assessment and interactional skills. The second semester broadens the knowledge and skill base and includes strategies of intervention and a practicum of three days per week in a social agency.

The second graduate year is organized around specialized concentration studies. Approximately half of the course work of the first semester is elective, and most of the second semester is devoted to a practicum related to the student's chosen area of concentration, usually based outside the immediate Columbia area. Many block field placements are located in St. Louis and Kansas City.

The school has an outstanding record of providing financial support to its graduate students. A large number of federal and state sponsored traineeships are available. Applications should be made directly to the school.

An accelerated master's program is available to qualified graduates of accredited BSW programs. Part-time graduate study is available and encouraged. Consult the school directly for more information.

SOCIOLOGY AND RURAL SOCIOLOGY

College of Arts and Sciences/ College of Agriculture

FACULTY

- J. Kenneth Benson**, professor, chairperson of sociology, PhD, University of Texas
Rex R. Campbell, professor, chairperson of rural sociology, PhD, University of Missouri-Columbia
John R. Hall, associate professor, director of graduate studies, PhD, University of Washington-Seattle
Bruce J. Biddle, professor, PhD, University of Michigan
John F. Galliher, professor, PhD, University of Indiana
Donald O. Granberg, professor, PhD, Pennsylvania State University
Peter M. Hall, professor, PhD, University of Minnesota
Edward W. Hassinger, professor, PhD, University of Minnesota
William Heffernan, professor, PhD, University of Wisconsin
Richard M. Hessler, professor, PhD, University of Pittsburgh
Daryl J. Hobbs, professor, PhD, Iowa State University
Hans O. Mauksch, professor emeritus, PhD, University of Chicago
Andrew C. Twaddle, professor, PhD, Brown University
Ted R. Vaughan, professor, PhD, University of Texas
Donald O. Cowgill, professor emeritus, PhD, University of Pennsylvania
Douglas Ensminger, professor emeritus, PhD, Cornell University
Robert W. Habenstein, professor emeritus, PhD, University of Chicago
Herbert F. Lionberger, professor emeritus, PhD, University of Missouri-Columbia
Robert L. McNamara, professor emeritus, PhD, Ohio State University
Barbara J. Bank, associate professor, PhD, University of Iowa
Edward E. Brent, associate professor, PhD, University of Minnesota
Jere L. Gilles, associate professor, PhD, Cornell University
Joel Hartman, associate professor, PhD, Pennsylvania State University
John S. Holik, associate professor, PhD, University of Missouri-Columbia
J. Craig Jenkins, associate professor, PhD, SUNY-Stony Brook
James R. Pinkerton, associate professor, PhD, University of Wisconsin
C. Edwin Vaughan, associate professor, PhD, University of Minnesota
Karen Altergott, assistant professor, PhD, University of Minnesota
Mary Jo Neitz, assistant professor, PhD, University of Chicago
Michael D. Woodard, assistant professor, PhD, University of Chicago

AFFILIATED FACULTY

- Derek G. Gill**, professor, PhD, University of Aberdeen (Scotland)
Stanley R. Ingman, associate professor, PhD, University of Pittsburgh

GRADUATE DEGREES OFFERED

MA in sociology

MS in rural sociology

PhD in sociology

PhD in rural sociology

The Departments of Sociology and Rural Sociology function on the graduate level as a single program with the same degree requirements in both departments, but with opportunities for specialization suited to the academic and professional interests of degree candidates. Major areas of specialization within the graduate program are sociological theory; social change and development; social psychology; medical sociology; comparative social institutions; social control, deviance, and crime; demography, organiza-

tions and work relations; sociology of aging; stratification, politics and the state; and sociology of agriculture.

The departments are organizationally affiliated with the Center for Aging Studies, the Center for Research in Social Behavior, the Office of Rural Development and the medical school.

Sources of support for students include fellowships, teaching assistantships and research assistantships.

MASTER'S DEGREE

To be admitted to the master's program, the department requires at least 12 hours of sociology at the undergraduate level, with a grade average of B (A=4.0) or better. The candidate must submit, with the application, scores from the GRE or the Miller Analogies Test.

Both the MA in sociology and the MS in rural sociology may be taken on a thesis or a non-thesis plan. Both plans require completion of 405, Theories of Society; 430, Techniques of Social Investigation; and 376, Advanced Social Statistics. The remainder of each student's program, including at least one seminar, depends upon the plan of study developed by the student and his or her advisor. A minimum of 30 hours is required in the thesis plan, and a minimum of 40 hours is required in the non-thesis plan. Completion of a satisfactory thesis is a requirement for continuing work toward the PhD degree.

DOCTORAL DEGREE

Although it is desirable that entering students have a strong background in sociology, applicants of high merit who do not have such a background are encouraged to apply. At the discretion of the Admissions Committee, such applicants may be required to take such graduate-level work as is necessary to remedy deficiencies in their background.

The typical PhD program consists of a combination of coursework and of independent study and research. Regardless of the number of hours of independent work that are included in a program, at least 30 hours of credit must be earned by taking regularly scheduled classes and seminars beyond those included in the master's program. In addition, all PhD candidates must complete a seminar in either qualitative or quantitative research methodology. The exact number of hours and types of courses included in the program depends upon the plan of study developed by the candidate and his or her advisory committee.

All students are required to take a qualifying examination in sociology theory and methodology during their first year of PhD work. At least eight months prior to the date on which they expect to complete the degree, candidates must pass four comprehensive examinations: a general written examination testing the candidate's ability to reason sociologically; a special, written examination covering theory and research in one of eight major areas within the discipline;

an individual, written examination tailored to the student's special research interests; and an oral examination.

SOUTH ASIA LANGUAGE AND AREA STUDIES

Information on this program is detailed in the AREA PROGRAM section immediately following the section on FIELDS OF STUDY in the catalog.

SPECIAL EDUCATION

College of Education

FACULTY

Carl C. Fehrle, acting chairperson, professor, PhD, University of Iowa

Veralee B. Hardin, director of graduate studies, professor, EdD, University of Missouri-Columbia

James E. Leigh, associate professor, assistant director of graduate studies, PhD, University of Southern California

Reuben Altmen, professor, PhD, University of Texas

Richard C. Schofer, professor, EdD, Northern Colorado University

Sandra Alper, associate professor, PhD, University of Iowa

Robert F. Busch, associate professor, PhD, University of Missouri-Columbia

Marilyn Chandler, associate professor, PhD, University of Iowa

Sandra Gautt, associate professor, PhD, University of Missouri-Columbia

Malcolm Flanagan, associate professor, EdD, University of Mississippi

Sharon Huntze, assistant professor, EdD, University of Missouri-Columbia

Jodi Johnson, assistant professor, EdD, University of Missouri-Columbia

Clifford Magnusson, assistant professor, EdD, Wayne State University

Stephen B. McCarney, assistant professor, EdD, University of Florida

Lynda L. West, assistant professor, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

MA or MEd in special education with the following emphasis areas: Behavior disorders, curriculum development for exceptional children, early childhood education for the handicapped, learning disabilities, mental retardation, or orthopedically handicapped

EdSp in special education with the following emphasis areas: Administration and supervision of special education, behavior disorders, curriculum development for exceptional children, learning disabilities or mental retardation

EdD or PhD in special education with the following emphasis areas: Administration and supervision of special education, behavior disorders, curriculum development for exceptional children, early childhood education for the handicapped, learning disabilities or mental retardation

The Department of Special Education has graduate programs designed to prepare teachers and leadership personnel in a variety of areas within special education. Program graduates assume roles as resource room teachers, teachers in self-contained units, consulting teacher, college professors, public and private school administrators and leaders in state and federal governmental agencies. The departmental programs are developed to

meet individual student's needs and interests within the framework of the requirements of each specific degree.

See *Education* in this section for general information. Additional information may be obtained from the director of graduate studies, Department of Special Education, 217 Education Building.

SPEECH AND DRAMATIC ART

College of Arts and Sciences

FACULTY

Carla Waal, professor, chairperson, PhD, University of Indiana

James W. Gibson, professor, director of graduate studies, PhD, Ohio State University

Stephen M. Archer, professor, PhD, University of Illinois

Larry D. Clark, professor, PhD, University of Illinois

Clifton Cornwell, professor, PhD, University of Missouri-Columbia

Barton L. Griffith, professor, PhD, University of Michigan

Weldon Durham, associate professor, PhD, University of Iowa

Richard Klepac, associate professor, PhD, University of Missouri-Columbia

Clyde Ruffin, associate professor, MFA, University of Iowa

Edward S. Small, associate professor, PhD, University of Iowa

Mary-Jeanette Smythe, associate professor, PhD, Florida State University

G. Joseph Wolfe, associate professor, PhD, University of Missouri-Columbia

Patrick Atkinson, assistant professor, MFA, Southern Mississippi University

Pamela Benoit, assistant professor, PhD, Wayne State University

James Miller, assistant professor, MFA, Southern Mississippi University

Michael Porter, assistant professor, PhD, University of Iowa

GRADUATE DEGREES OFFERED

MA in speech and dramatic art with an emphasis in radio-television-film, speech communication, or theatre

PhD in speech and dramatic art with an emphasis in radio-television-film, speech communication, or theatre

The Department of Speech and Dramatic Art offers graduate study toward MA and PhD degrees in each of three areas: speech communication, theatre and radio-television-film. All of the programs are interdisciplinary; they include work in other departments with related or complementary interests. Master's degree programs prepare students for a variety of careers, depending on the area studied. Doctoral programs are designed for students interested in college or university teaching and research.

The area of speech communication offers opportunities for study and research in the historical, critical and experimental aspects of speech. Courses from such fields as history, political science, sociology and psychology contribute to an interdisciplinary approach.

The area of theatre stresses the history, theory, criticism and practice of the art of theatre. Master's and doctoral programs are designed to develop the individual as an artist-scholar.

The area of radio-television-film provides some technical training in the master's degree program but emphasizes research on problems of commercial, educational and instructional broadcasting as they relate to the needs of a changing society. Doctoral programs are individually planned to broaden knowledge in radio-television-film and related fields.

Research materials include the UMC Ellis Library and its special collections on British and American public addresses, the Western Historical Manuscript Collections' materials on the Missouri River and Great Plains regions, the State Historical Society, and the Harry S. Truman Memorial Library in Independence, Missouri.

A University theatre, a speech communication laboratory and a radio-television-film studio serve as facilities for research and practice. In addition, students have the following opportunities:

Theatre: Participation in the University Theatre and Summer Repertory Theatre productions.

Radio-Television-Film: Involvement in various broadcasting video and film activities.

Graduate students are eligible to apply for fellowships, work-study grants, and graduate teaching assistantships.

MASTER'S DEGREE

An applicant must present (1) an undergraduate GPA of at least 3.0 (A = 4.0) for the last two years of undergraduate work; (2) GRE Aptitude Test scores; and (3) letters of recommendation when requested by the specific area. Students with lower GPAs may apply for admission on probation.

The master of arts degree may be completed under either a thesis option approved by an advisory committee or a non-thesis option. Both plans require a minimum of 30 hours of graduate credit, including at least 15 hours of course work numbered 400 or above. There is no language requirement.

For the assignment of advisors, students should see the director of the area in which they plan to study.

DOCTORAL DEGREE

To be accepted for advisement, a student usually must present (1) a minimum GPA of 3.0 (A = 4.0) for courses taken for the master's degree; (2) GRE Aptitude Test scores; and (3) three letters of recommendation.

A student desiring acceptance as a candidate must (1) demonstrate competence in speech; (2) take qualifying examinations during the first semester of registration if the master's degree was not completed on this campus; and (3) obtain the consent of a member of the department's teaching faculty to serve as an advisor.

Degree requirements include the successful completion of (1) a course of study designed in consultation with advi-

sory committee; (2) additional course work and/or foreign language examinations to satisfy one of the four options in the department's foreign language-related field requirement; (3) written and oral comprehensive examinations; (4) an approved research project culminating in a dissertation; (5) an oral examination deferring the dissertation.

FOREIGN LANGUAGE-RELATED FIELD REQUIREMENT OPTIONS

Option I: Demonstrate evidence of ability to translate into English two foreign languages by passing the ETS examination if the languages are French, German, Spanish or Russian, or by receiving certification of competence from a qualified examiner if other languages are presented.

Option II: Demonstrate a high order of competence in one foreign language by an additional examination conducted by the language department concerned.

Option III: Demonstrate evidence of ability to translate into English one foreign language either by examination or course work (as outlined above) and complete with grades of B (3.0) or better, at the post-master's level, nine semester hours in courses numbered 200 or above that represent a coherent unit of study, either relating to the field of major interest or providing a research tool applicable to that field from one or more departments outside the Department of Speech and Dramatic Art.

Option IV: complete with grades of B (3.0) or better, at the post-master's level, two blocks of course work of nine semester hours each (in courses numbered 200 or above), each block from one or more departments outside the Department of Speech and Dramatic Art and each representing a coherent unit of study. At least one block of course work must relate to the field of major interest; the other may provide a research tool that is applicable to that field.

STATISTICS

College of Arts and Sciences

FACULTY

John E. Hewett, professor, chairperson, PhD, Iowa State University

Frederick Williams, professor, associate chairperson, PhD, Northwestern University

Robert K. Tsutakawa, professor, director of graduate studies, PhD, University of Chicago

Asit P. Basu, professor, PhD, University of Minnesota

Shrinivas K. Katti, professor, PhD, Iowa State University

Gary F. Krause, professor, PhD, Virginia Polytechnic Institute

William A. Thompson Jr., professor, PhD, University of North Carolina

Wallace E. Franck, associate professor, PhD, University of New Mexico

James E. Holstein, associate professor, PhD, University of Iowa

Richard W. Madsen, associate professor, PhD, Iowa State University

Paul L. Speckman, assistant professor, PhD, University of California Los Angeles

S.N. Joshi, visiting assistant professor, PhD, Indian Statistical Institute

GRADUATE DEGREES OFFERED

MA in statistics

PhD in statistics

The Department of Statistics offers the master of arts and the PhD degrees. The graduate program provides opportunities for graduate study and thesis direction in various areas of probability and statistics, both theoretical and applied. The Statistical Consulting Center, located in the Mathematical Sciences Building, provides opportunities for statistical consulting and assists faculty and graduate students in cooperative research with people in other area. Regular statistics colloquia provide opportunities for faculty and graduate students to present the results of their research.

Special facilities in the department include terminals capable of handling all languages including APL. There are also numerous typewriter terminals and CRT terminals available nearby for student use.

The Mathematical Sciences Building houses the Departments of Mathematics, Statistics and Computer Science, and the University Computer Network, which has AMDAHL 470 V/7 and 470 V/8 and related auxiliary equipment. A large library of programs and subroutines is available. The mathematics library has an outstanding collection of books and journals pertaining to mathematics, statistics and computer science.

Fellowships and teaching and research assistantships are available to qualified graduate students. For further information, write the director of graduate studies, Department of Statistics.

Admission is open to any student who holds a baccalaureate degree from an accredited college, and whose record indicates the likelihood of successfully completing a graduate program in statistics. This usually implies an undergraduate major in an area which includes successful completion of the undergraduate calculus sequence. 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, as well as other criteria bearing on qualifications. Ordinarily students should have close to a 3.0 GPA (A = 4.0) in mathematics and statistics courses in order to enter the master's degree program, and close to a 3.5 average in mathematics and statistics in order to become PhD candidates.

The Department of Statistics recommends the GRE verbal and quantitative aptitude tests, and the GRE advanced mathematics test.

Prior to entering the graduate program, a student should have a background which includes matrix theory and calculus and some exposure to statistics. Required courses at the 300 level not taken as an undergraduate may be taken for graduate credit as part of the graduate program.

MASTER'S DEGREE

General Requirements

- (1) At least 30 semester hours of course work numbered 300 or higher of which at least 18 hours must be from the listings of the Department of Statistics. The 30 hours may not include credit hours of 385, 395, or more than a total of 6 hours of 400 or 490.
- (2) At least 15 semester hours of course work numbered 400 or higher must be taken from the listing of the Department of Statistics. The 15 semester hours cannot include more than a total of 3 hours of 400 or 490.

SPECIFIC REQUIREMENTS

- (1) Mathematics. The following courses are required if equivalent courses were not taken as an undergraduate: (a) 302 or 310 or the equivalent; (b) 331 or the equivalent. This course may not be used for credit towards the 30 hours under A.1
- (2) Statistics: (a) 325 or 326 if the equivalent courses were not taken as an undergraduate; (b) 464; (c) 403 or 465; (d) All candidates must submit a written report demonstrating an independent effort towards producing original work. This report may, with the advisor's consent, take the form of a thesis, a written review on a set of papers in statistics, or a written report on some independent study which may include an original application of statistics. For this work a student must register for at least 3 semester hours of Stat 400 or Stat 490.

MA EXAMINATION

All candidates are required to present an open seminar on the results of the written report described under B.2.d above. The MA examination will consist of an exam of the material presented in the written report and seminar, and over course work.

Additional courses which are recommended but not required are Math 303 or 311, Computer Science 104 or 201, and Statistics 416.

There is considerable flexibility in the program leading to the MA degree in statistics.

The accumulation of 9 credit hours with a grade of C or lower on a program for the degree ordinarily terminates a student's candidacy. If a graduate student receives 6 hours of C in courses offered by the department of the degree program, then candidacy for the MA degree is terminated unless specific action to the contrary is taken by the department. For each credit hour with a grade of C or lower, except for 3 credit hours, received in courses offered by the Department of Statistics at the 300 level and above, the student must receive a credit hour with a grade of A in courses offered by the department at the 300 level and above.

DOCTORAL DEGREE

Each student must pass a qualifying examination to be admitted to candidacy. Requirements for the PhD in statistics are determined by the student's advisory committee and the director of graduate studies. A dissertation is required, and the student must take a comprehensive examination and a final examination.

VETERINARY BIOMEDICAL SCIENCES

College of Veterinary Medicine

FACULTY

Robert C. McClure, interim chairperson and professor, DVM, Iowa State University, PhD, Cornell University

Myron E. Tumbleson, professor, director of graduate studies, Sinclair Farm, research associate, PhD, University of Minnesota

Esther M. Brown, professor, PhD, Michigan State University Homer E. Dale, professor, DVM, Iowa State University, PhD, University of Missouri-Columbia

Charles W. Foley, professor, PhD, University of Missouri-Columbia

V. K. Ganjam, professor, resident investigator, Dalton Research Center, BVSc, Andra, PhD, Oklahoma State University

Gary D. Osweiler, professor, veterinary pathology, DVM, PhD, Iowa State University

Vincent V. St. Omer, assistant professor, pharmacology, associate professor, DVM, PhD, University of Guelph

John F. Amann, assistant professor, DVM, PhD, Cornell University

William R. Hewitt, assistant professor, pharmacology, PhD, assistant professor, Michigan State University

George E. Rottinghaus, assistant professor, PhD, Iowa State University

GRADUATE DEGREES OFFERED

MS in veterinary anatomy

MS in veterinary physiology and pharmacology with an emphasis area in physiology

MS in veterinary physiology and pharmacology with an emphasis area in pharmacology

MS in veterinary physiology and pharmacology with an emphasis area in biochemistry and nutrition

INTERDISCIPLINARY DEGREES OFFERED

PhD in nutrition area program

PhD in physiology area program

PhD in anatomy

PhD in pharmacology

The Department of Veterinary Biomedical Sciences provides graduate study leading to the degree of master of science in veterinary anatomy and veterinary pharmacology with emphasis areas in physiology, pharmacology and biochemistry-nutrition. Graduate study leading to the doctor of philosophy degree is offered under the auspices of area programs in nutrition and physiology and through cooperative arrangements with the Departments of Anatomy and Pharmacology in the School of Medicine. In all cases, the program of study is arranged individually. Prospective students are encouraged to correspond directly with the director of graduate studies about the available opportunities.

Admission is based in part upon evaluation of the applicant through correspondence and personal interview to determine the motivation and purpose of pursuing graduate degrees. Letters of reference should be submitted, as well as a transcript of previous courses of study and GRE scores.

Facilities for research are available in the department and at the veterinary research farm and the Sinclair comparative medicine farm.

MASTER'S DEGREE, VETERINARY ANATOMY

The courses of study in veterinary anatomy include gross, microscopic and ultrastructural levels, comparative neuroanatomy and neurology, embryology and developmental anatomy and anatomy of laboratory animals.

The department has access to electron transmission and scanning electron microscopes. Electrophysiological monitoring and recording equipment, experimental surgery equipment and a giant microtome also are available. Supporting disciplines such as human anatomy, zoology, psychology and laboratory animal science are available on campus.

The requirements for a degree in the MS program depend upon whether the MS is a terminal degree or a step toward earning a PhD degree on this campus. All candidates are expected to demonstrate proficiency in neuroanatomy as well as in microscopic, developmental and gross anatomy. Continuation for the PhD degree requires statistics experience.

The student chooses an advisor and with an advisory committee plans the course of study consisting of a minimum of 30 hours beyond the baccalaureate degree. A thesis, based on original experimental laboratory investigation, and a final examination are required.

Work for the PhD degree can be accomplished through cooperation with the Department of Anatomy, School of Medicine. The requirements for this program are described under *Doctoral Degree for the Department of Anatomy*.

MASTER'S DEGREE, VETERINARY PHARMACOLOGY

Through this program graduate students gain a basis for understanding the fundamental principles of pharmacology and toxicology. Although planning a program is the responsibility of the student and adviser, the following courses (or their transferable equivalent) are required for the MS degree: Statistics 207 (3 hours); Pharmacology 320 (8 hours); Veterinary Anatomy-Physiology 326 or 427 (2-3 hours) or 328 (3 hours); physiological chemistry (Biochemistry 270, 272, and 274 or 304 and 305, or equivalent of these courses -6 hours); pharmacology (400 level courses in the area of the student's research interest 3-5 hours); Pharmacology 410 (2 hours); and Veterinary Anatomy-Physiology 490 (8-10 hours).

Students may choose to work on any of several different research projects, with instrumentation and laboratory space for investigations provided in the department. The main research areas, however, are neuropharmacology, neurotoxicology and behavioral teratology. A thesis resulting from an original experimental laboratory investigation is required.

The PhD degree in pharmacology is granted in cooperation with the Department of Pharmacology in the School of Medicine. Candidates should inquire about the opportunities and requirements for such a program.

MASTER'S DEGREE, VETERINARY PHYSIOLOGY

Graduate students in this section survey knowledge of normal functions in domestic animals and become familiar with research in the field.

The specific program of study for the MS degree depends on the background and interests of the student. Before enrolling for any course work, students should discuss this with their major professors. All programs must include physiology (15 hours); physiological chemistry (Biochemistry 270, 272, 274, or 304 and 305 or equivalent courses -6 hours); and statistics (3 hours).

The thesis is based on experimental physiological investigations conducted during the degree program.

Because research interests and faculty change, prospective students are advised to explore any proposed programs.

Work for the PhD degree in veterinary physiology can be accomplished in the department under the auspices of the area program in physiology.

VETERINARY MEDICINE AND SURGERY

College of Veterinary Medicine

FACULTY

James E. Creed, professor, chairperson, diplomate ACVS, DVM, University of Missouri-Columbia, MS, Colorado State University

Robert S. Youngquist, associate professor, director of graduate studies, diplomate, ACT, DVM, Iowa State University

Clarence J. Bierschwal, professor, extension veterinarian, diplomate, ACT, DVM, Iowa State University, MS, University of Missouri-Columbia

M. Joseph Bojrab, professor, diplomate, ACVS, DVM, Purdue University, MS, Oklahoma State University, PhD, University of Bristol

E. Allen Corley, professor, director, Orthopedic Foundation for Animals, diplomate, ACVR, DVM, University of Georgia, PhD, Colorado State University

Louis A. Corwin Jr., professor, diplomate, ACVR, DVM, PhD, Colorado State University

Harold E. Garner, professor, associate investigator, Dalton Research, DVM, Kansas State University, PhD, Baylor College of Medicine

Allen W. Hahn, professor, director of Computer Activities, investigator, Dalton Research Center, diplomate, ACVIM, DVM, University of Missouri-Columbia, PhD, Drexel Institute of Technology,

Kenneth H. Niemeyer, professor, associate dean, DVM, MS, University of Missouri-Columbia

Louis G. Tritschler, professor, director, Equine Center, DVM, MS, University of Missouri-Columbia

William F. Braun, associate professor, diplomate, ACT, DVM, University of Illinois

Claud B. Chastain, associate professor, Diplomate, ACVIM, DVM University of Missouri-Columbia, MS, Iowa State University

Robert B. Miller, associate professor, diplomate, AAVP, DVM, Kansas State University, MS, PhD, University of Missouri-Columbia

James G. Thorne, associate professor, director, Continuing Education, and Extension, diplomate AAVP, DVM, University of Missouri-Columbia, PhD, University of Georgia

William A. Wolff, clinical associate professor, DVM, MS, Colorado State University

Everett Aronson, assistant professor, diplomate ACVR, DVM, University of Illinois, MS, Michigan State University

Eleanor M. Green, assistant professor, DVM, Auburn University, MS, University of Florida

Thomas S. Hurst, assistant professor, member, RCVS, BVSc, University of Bristol, MVetSc, University of Saskatchewan

Brent D. Jones, assistant professor, DVM, Colorado State University

Jimmy C. Lattimer, assistant professor, Diplomate, ACVR, DVM, Washington State University, MS, Colorado State University

Dudley L. McCaw, assistant professor, diplomate, ACVIM, DVM, University of Illinois

Robert Eric Miller, adjunct assistant professor, St. Louis Zoo, DVM, Ohio State

Dennis O'Brien, assistant professor, diplomate, ACVIM, DVM, MS, PhD, University of Illinois

Arthur L. Ortenburger, assistant professor, DVM, Washington State University, MS, Michigan State University

John J. Robertson, assistant professor, DVM, University of California

Paul Tamas, assistant professor, DVM, Budapest, Hungary

James Tomlinson, assistant professor, DVM, University of Minnesota

Cynthia A. Wheeler, assistant professor, DVM, Michigan State University, MS, Colorado State University

Gene M. Zinn, assistant professor, DVM, Iowa State University, PhD, University of Missouri-Columbia

Clifton N. Murphy, instructor, DVM, University of Missouri-Columbia, MS, Colorado State University

Jerome E. Roth, instructor, DVM, University of Missouri-Columbia

GRADUATE DEGREE OFFERED

MS in veterinary medicine and surgery

The Department of Veterinary Medicine and Surgery offers graduate work leading to the master of science degree and supervision for postdoctoral study and research. The program provides advanced training in food animal, equine and companion animal medicine and surgery, anesthesiology, comparative cardiology, ophthalmology, theriogenology, radiology and radiation biology.

The complete medical records maintained on all animals entering the clinic provide a source for comparisons with current clinical materials. Graduate students have immediate access to the clinic patients, medical records and facilities of the Veterinary Medical Teaching Hospital to aid them in clinical research. The College of Veterinary Medicine Research Farm is used for laboratories and animal holding. The college has its own library.

For information and application forms regarding financial assistance, teaching and research assistantships and fellowships, write to the department chairman.

DEGREE REQUIREMENTS

The DVM degree or its equivalent, as approved by the department, is a prerequisite for advanced study. Performance in the professional curriculum greatly influences selection of applicants for graduate

study. In addition, the applicant must rank in the upper half of their respective graduating class and must take the Graduate Record Examination. The professional curriculum completed by the applicant is compared with that offered at UMC. Applicants are asked to strengthen any deficiencies, especially prerequisites to the chosen area of concentration.

Planning a program of study is the student's responsibility. The advisor assists the student with the program plan. Because of many areas of concentration within the department and advantages of interchanges among them, an advisory committee should be selected within the first semester of study and a definite program accepted. Members of this committee (three or more) may be recommended later for appointment to the examining committee. The four of five-member advisory group should consist of the major advisor and other members of the department, a member from another department within the college and a member from outside the college. Members of the final examination committee should be chosen in the same manner as the advisory committee.

A thesis which reports the results of original research and is suitable for publication is generally required of all candidates.

VETERINARY MICROBIOLOGY

College of Veterinary Medicine

FACULTY

C. Andrew Carson, professor, chairperson, PhD, University of Illinois, VMD, University of Pennsylvania

Hans K. Adldinger, professor, director of graduate studies, DVM, University of Munich, PhD, Cornell University

John N. Berg, professor, DVM, Iowa State University, PhD, University of Missouri-Columbia

Donald C. Blenden, professor, MS, DVM, University of Missouri-Columbia

Glen R. Brown, professor, PhD, University of Oklahoma

Robert M. Corwin, professor, DVM, Michigan State University, PhD, University of Georgia

Emmett L. McCune, professor, DVM, University of Missouri-Columbia, PhD, University of Minnesota

Bruce D. Rosenquist, professor, DVM, Iowa State University, PhD, University of Missouri-Columbia

Robert F. Solorzano, professor, PhD, Pennsylvania State University

Gerald M. Buening, associate professor, DVM, PhD, Purdue University

William F. Fales, associate professor, PhD, University of Idaho

Theodore J. Green, associate professor, BS, Cornell University, PhD, Ohio State University

David G. Thawley, associate professor, BVSc, Massey University, PhD, University of Guelph

Manuel J. Torres-Anjel, associate professor, DVM, National University of Colombia, SA, PhD, University of California-Davis

GRADUATE DEGREE OFFERED

MS in veterinary microbiology

INTERDISCIPLINARY AREA DEGREE

PhD in microbiology area program

The Department offers advanced study leading to the master of science in veterinary microbiology. The doctor of philosophy is offered as part of the area program in microbiology.

The MS and PhD programs are designed to prepare students for teaching, research and diagnostic service in veterinary microbiology, infectious diseases and the biomedical areas.

As a specialized segment of microbiology, veterinary microbiology involves studies of the host-parasite relationship. Infectious disease, host resistance, immunology and preventive medicine are emphasized. Graduate programs include courses in biochemistry, genetics, immunology, pathology, physiology, radiobiology, statistics and ultrastructural morphology, as well as bacteriology, mycology, parasitology and virology. Specific areas of concentration are bacteriology, epidemiology, immunology, mycology, parasitology, veterinary community health and virology.

Research, teaching laboratories and other departmental facilities are located in Connaway Hall. Facilities for animal care are located in Connaway Hall and the Veterinary Medicine Research Farm on Brown Station Road, four miles north of the campus. Additional animal facilities are available at other locations.

A limited number of stipends are available from research grants. Other sources of support include National Institutes of Health postdoctoral and special fellowships, other fellowships and assistantships funded by the federal or state government and stipends from commercial companies. Students provide their own support from private, commercial and governmental sources.

MASTER'S DEGREE

The following are requirements for admission:

- (1) a professional degree or a baccalaureate degree in a biological or physical science;
- (2) rank in the upper one-half of the graduating class;
- (3) a minimum GPA of 3.0 (A=4.0). Students with a GPA of 2.5-3.0 may be admitted based upon superior test scores, work experience and outstanding recommendations;
- (4) the approval of the adviser, the department chairperson and the director of graduate studies, and
- (5) a combined score on the aptitude section of the GRE of at least 1,000. This test is required.

In exceptional cases, students who do not meet the established requirements may be accepted for a one-semester probationary period during which they must attain at least a B average to continue graduate study.

Under the guidance of an advisor, a program of study is designed to fit the student's academic background, experience and objectives. The course of study must include a minimum of 9 credit hours outside the department, including one course in biochemistry or biostatistics (300 or 400 level). This latter requirement may be waived for students who

present evidence of satisfactory completion of equivalent courses from another institution.

Upon satisfactory completion of the course work and thesis, the Graduate School appoints a final examination committee composed of at least one member from the area of microbiology and one member from outside the department.

VETERINARY PATHOLOGY College of Veterinary Medicine

FACULTY

Lawrence G. Morehouse, professor, interim chairman veterinary pathology, director Veterinary Medical Diagnostic Laboratory, DVM, PhD, Purdue University

Gary S. Johnson, assistant professor, director of graduate studies, DVM, PhD, Kansas State University

Loren D. Kintner, professor, DVM, MS, University of Missouri-Columbia

Stuart L. Nelson, professor, DVM, PhD, Purdue University

LeRoy D. Olson, professor, DVM, PhD, Purdue University

Donald A. Schmidt, professor, DVM, PhD, Michigan State University

Joseph E. Wagner, professor, DVM, PhD, University of Illinois

Kenneth D. Weide, professor, DVM, PhD, Michigan State University

Harry H. Berrier, professor emeritus, DVM, MS, University of Missouri-Columbia

Willard H. Eyestone, professor emeritus, DVM, PhD, University of Wisconsin

Raymond L. Hodges, associate professor, LLM, George Washington University

Darrell A. Kinden, associate professor, PhD, University of Missouri-Columbia

Robert B. Miller, associate professor, DVM, PhD, University of Missouri-Columbia

Bonnard L. Moseley, associate professor, DVM, MS, University of Missouri-Columbia

Ann Kier-Schroeder, associate professor, DVM, PhD, University of Missouri-Columbia

Larry P. Thornburg, associate professor, DVM, PhD, University of North Carolina

Linda L. Collier, assistant professor, DVM, PhD, Washington State University

Harold F. Stills Jr., assistant professor, DVM, Ohio State University

Steven L. Stockham, assistant professor, DVM, MS, Michigan State University

William J. Boever, adjunct assistant professor, DVM, University of Missouri-Columbia

GRADUATE DEGREES OFFERED MS in veterinary pathology

INTERDISCIPLINARY AREA PROGRAM

PhD in pathology area program

The Department of Veterinary Pathology offers graduate work leading to the master of science in veterinary pathology and also cooperates with the Department of Pathology of the School of Medicine and the Department of Plant Pathology of the College of Agriculture in offering a PhD program in the pathology area program.

The laboratories and equipment described in the pathology area program generally are available for MS candidates. The areas' fields of study are applicable to the departmental program.

Write the departmental director of graduate studies for details and application forms for assistantships and fellowships.

MASTER'S DEGREE

For admission to the master of science program in veterinary pathology, the applicant should have completed the DVM or an acceptable baccalaureate degree. The latter would include subject courses in anatomy, microbiology, physiology, biochemistry and pathology or their equivalents. Students who are not in the upper one-third of their graduating classes may be admitted on probationary status for one semester. Parts I, II and III of the GRE must be taken either before entering Graduate School or during the first semester.

An advisory committee of three faculty members is established during the first semester to assist in formulating a study plan, and to advise the student on thesis research.

A student must complete a minimum of 30 graduate credit hours in pathology courses other than 490. A minor, if chosen, must be approved by the professor of the minor subject and is included in the final examination. There is no language requirement.

An acceptable thesis or a paper acceptable for publication in a major journal and a final examination, chiefly in defense of the thesis, are required of all MS degree candidates. It is possible for a student to transfer to the PhD program without completing the MS degree requirements. Contact the director of graduate studies for information.



AREA PROGRAMS

AREA PROGRAMS

Area Programs may or may not offer degrees (see individual descriptions below).

ANCIENT STUDIES AREA

FACULTY

Eugene N. Lane, professor of classical studies, chairperson, PhD, Yale University

William B. Bondeson, professor of philosophy, PhD, University of Chicago

Albert Leonard, professor of art history and archaeology, PhD, University of Chicago

Fordyce Mitchel, professor of history, PhD, Yale University

Ralph M. Rowlett Jr., professor of anthropology, PhD, Harvard University

Theodore A. Tarkow, professor of classical studies, PhD, University of Michigan

Kathleen Slane, assistant professor of art history and archaeology, PhD, Bryn Mawr College

The ancient studies area is an interdisciplinary program in anthropology, art history and archaeology, classical studies, history and philosophy offering a minor for both the MA and PhD degrees. Students who pursue graduate degrees in one of the participating departments are eligible to work for the minor in ancient studies. To participate in the program, they must make formal application to the chairperson.

If accepted, approximately one third of their course work will constitute a minor.

Specifically, they must satisfy the following requirements:

- (1) For a master's degree with a minor in ancient studies, students must take at least 9, but no more than 15 hours of approved course work in at least two of the related departments other than the major department.
- (2) For a PhD degree with a minor in ancient studies, students must take at least 24 hours of approved course work (beyond the BA) in three of the related departments other than the major department. As part of these 24 hours, they must take at

least one course at the 400 level in each of two separate, but related, departments.

BLACK STUDIES AREA

FACULTY

Arvarh E. Strickland, director of graduate studies, professor of history, PhD, Illinois

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 Afro-American background and experience. 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 adviser designated to assist in this matter. In the absence of other information, students should contact the director of graduate studies.

CLASSICS AND CLASSICAL ARCHAEOLOGY

College of Arts and Sciences

FACULTY

Charles Saylor, professor, chairperson, PhD, University of California

Barbara P. Wallach, assistant professor, director of graduate studies, PhD, University of Illinois

Eugene N. Lane, professor, PhD, Yale University

Theodore A. Tarkow, professor, PhD, University of Michigan

John C. Thibault, professor, PhD, University of Illinois

Victor A. Estevez, associate professor, PhD, University of Wisconsin

Edward A. Schmoll, visiting assistant professor, PhD, University of Iowa

GRADUATE DEGREE OFFERED

PhD in classics and classical archaeology

The minimum requirements for admission to the PhD program include an AB degree from an accredited college or university, a reading knowledge of Greek and/or Latin, and sufficient reading knowledge of German and/or French (or, in justifiable instances, Italian).

The minimum course of study requirements for the degree are 36-42 hours in classical studies at the 300 and 400 levels; at least 8 hours of dissertation credit not included in formal course work; and a passing grade of A or B in at least 24 hours of graduate-level courses outside the major department (at least 15 must be in one department, field, area or program).

The precise details of the student's program are determined by the student and advisor. Courses in classical archaeology must be taken at some time during the student's program.

Though some command of German and/or French (or Italian) is necessary from the outset, students are required to have demonstrated proficiency in one of the languages by registration for their second year of graduate study and in the

second language by final registration for their third year.

By the beginning of the second year, the student should ask the advisor to officially recommend an advisory committee of five persons to administer the two-part departmental qualifying examination. The written examination consists of translations of passages from Greek and Latin literature, based on a reading list composed by the student and advisor. The oral examination covers the major authors and works of the classical periods of Greek and Latin literature.

After the successful completion of residence, language and course requirements, the student must pass the comprehensive examinations consisting of five examinations in the following fields: (1) Greek literature, (2) special author (Greek), (3) Latin literature, (4) special author (Latin) and (5) minor field. A special topic may be substituted for one of the special authors.

The student then should complete a dissertation and secure approval according to regulations, and pass a final oral examination on the thesis of the dissertation and on related subjects.

GENETICS AREA Graduate School

FACULTY

Jack B. Bekett, assistant professor, interim chairperson, director of graduate studies, PhD, University of Wisconsin

Allan B. Burdick, professor, PhD, University of California-Berkeley

Edward H. Coe Jr., professor, PhD, University of Illinois

Abraham Eisenstark, professor, PhD, University of Illinois

Charles S. Gowans, professor, PhD, Stanford University

Gordon Kimber, professor, PhD, University of Manchester (England)

C. Donald Miles, professor, PhD, Indiana University

Myron G. Neuffer, professor, PhD, University of Missouri-Columbia

Gyorgy P. Redei, professor, CS, University of Budapest (Hungary)

Om P. Sehgal, professor, PhD, University of Wisconsin

Armon F. Yanders, professor, PhD, University of Nebraska

William Q. Loegering, professor emeritus, PhD, University of Minnesota

Henry A. McQuade, professor emeritus, PhD, Washington University (St. Louis)

Ernest R. Sears, professor emeritus, PhD, Harvard University

Paul F. Agris, associate professor, PhD, Massachusetts Institute of Technology

Linda F. Chapman, associate professor, PhD, University of California-Los Angeles

John D. David, associate professor, PhD, Vanderbilt University

Gregory G. Doyle, associate professor, PhD, University of Illinois

J. Perry Gustafson, associate professor, PhD, University of California-Davis

Gary Y. Kikudome, associate professor, PhD, University of Illinois

Russell L. Larson, associate professor, PhD, University of Illinois

Donald L. Riddle, associate professor, PhD, University of California-Berkeley

Louis A. Sherman, associate professor, PhD, University of Chicago

David A. Slepner, associate professor, PhD, University of Wisconsin

George P. Smith, associate professor, PhD, Harvard University

Richard J. Wang, associate professor, PhD, University of Colorado

Diana G. Helsel, assistant professor, PhD, Iowa State University

Lotti M. Sears, assistant professor, PhD, University of California-Berkeley

GRADUATE DEGREES OFFERED

Interdisciplinary Area Programs:

MS in genetics area

PhD in genetics area

Study in the genetics area program leads to the degrees of master of science and doctor of philosophy. The program, designed to provide broad, individualized training, prepares graduates for teaching and research careers in genetics.

Applicants with a GPA of B and higher or equivalent during the last two years of course work are considered. Particular consideration is given to an applicant's preparation in the sciences. Application should be made to the director of graduate studies. A complete application consists of official transcripts, letters of recommendation, scores on the GRE (aptitude and biology), and the form entitled Application for Admittance to the Division of Biological Sciences for Graduate Studies.

Applicants are expected to have a broad background in biology, an introductory course in genetics equivalent to that offered at UMC and one or more courses in each of the following: organic chemistry, biochemistry, mathematics (preferably through calculus), physics and statistics. Deficiencies in these subjects are to be remedied promptly after admission.

In addition to the requirements of the Graduate School, the minimum requirements for the degree are outlined below.

MASTER'S DEGREE

Biological Sciences 202 and 241 (no-credit status), advanced courses in genetics, biochemistry, two seminars and thesis (on approval, credits in Biological Sciences 400 may be substituted). These requirements and other courses are determined with the student's advisor.

DOCTORAL DEGREE

Biological Sciences 202 and 241 (no-credit status), advanced courses in genetics, biochemistry, advanced courses in physiology and metabolism, three seminars, some form of teaching in biology which prepares the student to enter a teaching career. Other advanced courses and language requirements are prescribed by the student's advisory committee.

GERONTOLOGY-MINOR

FACULTY

C. Edwin Vaughan, coordinator, chairperson, sociology and rural sociology, PhD, University of Minnesota

This graduate interdisciplinary minor is available for both master's and PhD level degrees. For information concerning curriculum offerings and participating faculty contact the Center for Aging Studies, 823 Clark Hall, 882-6011 or C. Edwin Vaughan, 882-6011.

INTERNATIONAL DEVELOPMENT AREA-MINOR

FACULTY

Alvin S. Lackey, professor, coordinator, community development, PhD, Cornell University.

This interdisciplinary minor is available to all graduate students who are interested in studying about national development in Third World countries. It requires 12 semester hours including one required course. Students interested in learning more about this minor should contact the coordinator in 727 Clark Hall, 882-8393.

LABORATORY ANIMAL MEDICINE AREA

FACULTY

Joseph E. Wagner, professor of veterinary pathology, chairperson, DVM, Iowa State University, PhD, University of Illinois

Ronald McLaughlin, assistant professor of microbiology, director of graduate studies, DVM, Iowa State University

Reuel R. Hook Jr., associate professor of microbiology, PhD, University of West Virginia

Myron E. Tumbleson, associate professor of veterinary anatomy/physiology, PhD, University of Minnesota

Ann Kier, assistant professor of veterinary pathology, DVM, Texas A & M University, PhD, University of Missouri-Columbia

Harold F. Stills Jr., assistant professor of veterinary pathology, DVM, Ohio State University

Earl K. Steffen, assistant professor of veterinary pathology, microbiologist and research, PhD, University of Missouri-Columbia

Stephen T. Kelley, assistant professor of pathology, DVM, Kansas State University

Cynthia E. Kendall, assistant professor of veterinary pathology, immunobiologist and research assistant, PhD, University of Texas-Austin

Cynthia L. Besch-Williford, instructor of veterinary pathology, DVM, LSU-Baton Rouge

GRADUATE DEGREE OFFERED MS in laboratory animal medicine area

The postdoctoral training program in laboratory animal medicine at the University of Missouri-Columbia is a three year NIH supported program leading to the MS degree in laboratory animal medicine and eligibility for ACLAM certification. The program includes residency rotations, graduate course work and thesis research. During the first 18 months each postdoctoral fellow spends six months in each of the following rotations: research animal diagnostic and investigative laboratory at the College of Veterinary Medicine, The Department of Laboratory Animal Medicine at the School of Medicine or the Sinclair Comparative Medicine Research Farm and, in the laboratory of an established investigator. The last 18 months are spent with half time devoted to research training under an established investigator and half time in residency in one of the areas listed above.

Required graduate course work includes:

- (1) Diseases and pathology of laboratory animals
- (2) Methodology of animal experimentation

- (3) Use of animals in research and teaching
- (4) Biology of laboratory animals
- (5) Laboratory animal colony management
- (6) Statistics
- (7) Seminar

Elective University courses that are frequently taken by postdoctoral fellows include:

- (1) Advanced Histopathology
- (2) Oncology
- (3) Genetics
- (4) Immunology
- (5) Biochemistry
- (6) Virology

Thesis research typically deals with the application of an animal model in the investigation of human diseases or the study of specific naturally occurring laboratory animal diseases.

Examples of previous and current thesis research subject matter include: Soft tissue mineralization in mice; pathogenic *escherichia coli* in hamster enteritis; antibiotics to *nosema cuniculi*; autoimmune thyroiditis in guinea pigs; cytauxplasmosis in chinchillas; feline cytotoxic zoonosis; melanomas in swine; diabetes mellitus in *Mystromys albicaudatus*; proliferative ileitis of hamsters; tyzzer's disease in research animals; hageman trait in cats (factor XII deficiency); mycoplasmosis in rats; actinobacillus infections in laboratory mice.

Typically there are 6-8 postdoctoral fellows in the program at one time. Sharing of experiences and cooperation among these individuals has proven to be an important factor in the success of the program.

Financial support is usually by stipends from an NIH Training Grant, individual NIH postdoctoral fellowships or state funds.

The three year program offers considerable exposure to administration and operation of laboratory animal facilities under the direction of an ACLAM diplomate. This, in addition to a solid didactic program and research experience, forms the basis for graduates of this program being well prepared for a variety of laboratory animal positions in academia and industry.

To apply for the program request admissions information and forms from the director of admissions, Jesse Hall, University of Missouri-Columbia, Columbia, Missouri 65211. In addition, send a copy of your veterinary college transcript, a curriculum vitae and the names of three individuals that we may contact as references.

LINGUISTICS AREA

FACULTY

Donald M. Lance, professor of English, chairperson, PhD, University of Texas

James D. Amerman, associate professor, speech pathology program, PhD, University of Illinois

Ruth H. Firestone, associate professor of German, PhD, University of Colorado

Louanna Furbee, associate professor of anthropology, PhD, University of Chicago

Magdalena Garcia-Pinto, assistant professor of Spanish, PhD, University of Texas

Daniel E. Gulstad, professor of Spanish, PhD, University of Illinois

Benjamin L. Honeycutt, associate professor of French, PhD, Ohio State University

Winifred B. Horner, associate professor of English, PhD, University of Michigan

Eugene N. Lane, professor of Classical Studies, PhD, Yale University

Linnea D. Lilja, associate professor of curriculum and instruction, PhD, University of Minnesota

Marjorie Marlin, associate professor of psychology, PhD, University of Illinois

Dorothy Watson, professor of curriculum and instruction, PhD, Wayne State University

C. Gilbert Youmans, assistant professor of English, PhD, University of Wisconsin

GRADUATE DEGREE OFFERED

MA in linguistics

The linguistics area program, offering work leading to a master of arts in linguistics, is staffed by faculty from various departments of the University. Supporting course work may include foreign languages and literature, psychology, philosophy, English, education, speech, anthropology or South Asian studies.

A Kay sonograph is available to perform spectrographic analyses of speech.

Financial aid, when available, is arranged through the participating departments. For further information, write the director of graduate studies, Linguistics Area Program, 231 Arts and Science Building.

MASTER'S DEGREE

To be accepted as an MA candidate, a student must have taken an introductory course in general linguistics. Admission to the program is contingent upon recommendation of the linguistics faculty. An adviser with appropriate academic interests is selected from the linguistics staff to aid the candidate in planning a program. All candidates must complete with grades of B or better a core program of 5 courses in linguistics as prescribed by the Linguistics Committee. Additional courses may be taken in linguistics or in related areas.

Foreign languages are not required but normally are included in a linguistics program; these needs are determined on an individual basis.

A candidate has an option of two programs of study: (1) 24 hours of course work plus a 6-credit-hour thesis; or (2) 30 credit hours of course work. In either program, a student must take 15 hours of 400-level course work and not more than 12 hours in readings and research. Either plan culminates in a two-part final: a five-hour written portion to be followed within a week by an hour-long oral portion. A candidate of the thesis program also must pass an examination, either written or oral, covering the research and related topics.

MEDIEVAL AND RENAISSANCE STUDIES AREA

FACULTY

Edzard Baumann, associate professor of art history, chairperson, PhD, University of Vienna
Donald K. Anderson Jr., professor of English, PhD, Duke University
Robert M. Bender, professor of English, PhD, University of Michigan
William B. Bondeson, professor of philosophy, PhD, University of Chicago
Thomas D. Cooke, professor of English, PhD, University of Pittsburgh
Ebion De Lima, professor of Portuguese, PhD, Pontifical University of Sao Paulo
Daniel E. Gulstad, professor of Spanish, PhD, University of Illinois
C. Haskell Hinnant, professor of English, PhD, Columbia University
James V. Holleran, professor of English, PhD, Louisiana State University
William M. Jones, professor of English, PhD, Northwestern University
Claudia Kren, professor of history, PhD, University of Wisconsin
Andrew C. Minor, professor of music history, PhD, University of Michigan
Bonner Mitchell, professor of French and Italian, PhD, Ohio State University
Charles G. Nauert Jr., professor of history, PhD, University of Illinois
Osmund Overby, professor of art history, PhD, Yale University
John R. Roberts, professor of English, PhD, University of Illinois
John C. Thibault, professor of classical studies, PhD, University of Illinois
Vern G. Williamsen, professor of Spanish, PhD, University of Missouri-Columbia
Russell Zguta, professor of history, PhD, Pennsylvania State University
Charles E. Mullett, professor emeritus of history, PhD, Columbia University
Homer L. Thomas, professor emeritus of art history and archaeology, PhD, University of Edinburgh
Ruth H. Firestone, associate professor of German, PhD, University of Colorado
John Foley, associate professor of English, PhD, University of Massachusetts-Amherst
Ben L. Honeycutt, associate professor of French, PhD, Ohio State University
Norman Land, associate professor of art history, PhD, University of Virginia
Howard T. Mancing, associate professor of Spanish, PhD, University of Florida
N. Patrick Peritore, associate professor of political science, PhD, University of California-Santa Barbara
Margaret P. Sommers, associate professor of French, PhD, Stanford University
Martin Camargo, assistant professor of English, PhD, University of Illinois
Russell J. Meyer, assistant professor of English, PhD, University of Virginia

The staff of the medieval and renaissance studies program is composed of faculty members from the Departments of Art History, Classical Studies, English, Germanic and Slavic Studies, History, Music, Philosophy and Romance Languages. A doctoral candidate in one of these departments offering a PhD may elect a minor concentration in interdisciplinary medieval or Renaissance studies by taking a number of 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. Under certain circumstances, a minor in medieval or Renaissance stud-

ies may also be arranged for MA programs.

Ellis Library has large collections in the Medieval and Renaissance fields and course offerings in the two fields are extensive.

Information on fellowships may be obtained by writing to the director of graduate studies in the department of major interest.

DEGREE REQUIREMENTS

A student must be accepted for graduate work by the major department. Then, in consultation with the major adviser, who must be a specialist in the medieval or Renaissance period, an interdisciplinary curriculum for the minor is prepared and submitted to the area committee for approval. Because the program places considerable emphasis on foreign languages, all doctoral candidates must study at least two; sometimes more are required.

MICROBIOLOGY AREA

FACULTY

Marion L. Fields, professor of food science and nutrition, chairperson, PhD, Purdue University
Gerald M. Buening, professor of veterinary microbiology, director of graduate studies, DVM, PhD, University of Purdue
Hans K. Adldinger, professor of veterinary microbiology, DVM, University of Munich, PhD, Cornell University
James T. Barrett, professor of medical microbiology, PhD, University of Iowa
Donald C. Blenden, professor of veterinary microbiology, DVM, University of Missouri-Columbia
Olen R. Brown, professor of veterinary microbiology, PhD, Oklahoma University
C. Andrew Carson, professor of veterinary microbiology, DVM, Pennsylvania University, PhD, University of Illinois-Urbana
Abraham Eisenstark, professor of biological sciences, PhD, University of Illinois-Urbana
Richard A. Finkelstein, professor, medical microbiology, PhD, University of Texas-Austin
Charles S. Gowans, professor of biological sciences, PhD, Stanford University
Arthur P. Harrison Jr., professor of biological sciences, PhD, University of Maryland
Edward J. Hsu, professor of biology and medicine, PhD, University of California
Robert T. Marshall, professor of food science and nutrition, PhD, University of Missouri-Columbia
Leroy D. Olson, professor of veterinary pathology, DVM, University of Minnesota, PhD, University of Purdue
Joseph T. Parisi, professor of medical microbiology, PhD, Ohio State University
Marvin Rogolsky, professor of biology and medicine, PhD, Syracuse University
Bruce D. Rosenquist, professor of veterinary microbiology, DVM, Iowa State University, PhD, University of Missouri-Columbia
Ronald F. Sprouse, professor of medical microbiology, PhD, University of Oklahoma
Robert F. Solorzano, professor of veterinary microbiology, PhD, Pennsylvania State University
Herbert A. Wenner, professor of pediatrics, MD, Rochester University
John N. Berg, associate professor of veterinary microbiology, DVM, Iowa State University, PhD, University of Missouri-Columbia
Linda F. Chapman, associate professor of biological sciences, PhD, University of California-Los Angeles
Robert M. Corwin, associate professor of veterinary microbiology, DVM, Michigan State University, PhD, University of Georgia
William H. Fales, associate professor of veterinary microbiology, PhD, University of Idaho
Rona Hirschberg, associate professor of biology and medicine, PhD, University of Wisconsin
Charlotte D. Parker, associate professor of medical microbiology, PhD University of California-Los Angeles

Hammond G. Riggs, associate professor of medical microbiology, PhD, University of Texas
Louis A. Sherman, associate professor of biological sciences, PhD, University of Chicago
David G. Thawley, associate professor of veterinary microbiology, B.V.Sc., Massey University, PhD, University of Guelph
F. Jerry Volenec (associate membership), associate professor of medicine, PhD, Cornell University
Richard F. Wang, associate professor of biological sciences, PhD, Colorado University
John DeSena (associate member), assistant professor of biology and medicine, PhD, St. John's University

GRADUATE DEGREE OFFERED PhD in microbiology area program

The area program in microbiology is staffed by faculty from the Departments of Food Science and Nutrition (College of Agriculture), Microbiology (School of Medicine), the Divisions of Biological Sciences (College of Arts and Science), Veterinary Pathology and Veterinary Microbiology (College of Veterinary Medicine) and Biology (UMKC College of Arts and Sciences).

With the broad scope of the program and its cross-departmental organization, the area keeps abreast of technical changes and advanced research techniques developed for obtaining biological information at the subcellular or molecular level.

Special facilities for study and research include infrared, ultraviolet and visible light spectrophotometers; ultraviolet, darkfield, phase and electron microscopes; high speed preparative and analytical ultracentrifuges; lyophilization equipment; column chromatography; and paper, disc, starch and gel electrophoresis.

The area program in microbiology leads to a doctor of philosophy degree. Areas of concentration which a student may pursue are antibiotics; antisepsis, disinfection and sterilization, ecology; immunology; microbial genetics; mycology, parasitology; microbial physiology; virology; infectious disease; aspects of microbial pathology; and food microbiology.

The microbiology area program is designed to prepare students for advanced professional careers in universities and colleges, research institutes, public health and hospital laboratories, and industrial research.

Many students admitted to the area program are awarded teaching or research assistantships administered through the participation departments. Under the guidance of faculty members, teaching assistants are given practical experience in planning, organizing, teaching, laboratory preparation and evaluating subject matter in microbiology. Research assistants work with faculty members to obtain practical experience in the planning of research proposals, the collection of research data and the writing of research reports.

Write the area program director for further information.

THE PhD PROGRAM

To be accepted for advisement in the area program, a student should have completed mathematics through college algebra, 10 hours of chemistry including

organic, 10 hours of biology and 5 hours of physics.

The master's degree or a professional college degree (MD or DVM) may be accepted as meeting requirements for admission in lieu of the minimal grade point average stipulated under Regulations for Admission, providing the applicant attained a minimal GPA of 3.0 (A = 4.0) in graduate courses. Prospective graduate students must submit GRE aptitude test scores to be considered for admission to the area.

To be considered for candidacy, an applicant must show satisfactory performance on a qualifying examination administered by the advisory committee. The UMC master's examination may be accepted in lieu of the PhD qualifying examination.

This program normally requires three years beyond the master's degree and consists of a course of study, practical experience in teaching and research, a comprehensive examination, and demonstration of research and writing ability by completing a doctoral dissertation on an approved research problem.

The majority of the student's advisory and examining committees shall be from the area faculty. Under the guidance of an advisory committee, a course of study is individually designed to fit each student's academic background, experience and objectives. Courses normally suggested for completion include one course each in calculus, physical chemistry and statistics; one general and two advanced courses in 300 and 400-level courses in microbiology. Courses may be chosen from one or more departments, as determined by the advisory committee, but shall constitute a definite plan of training for research or scholarly investigation in some particular aspect of microbiology.

The final examination covers chiefly the dissertation.

NUTRITION AREA

FACULTY

M. E. Tumbleson, professor of veterinary biomedical sciences, chairperson, director of graduate studies, PhD, University of Minnesota

Helen L. Anderson, professor of human nutrition, foods and food systems, management, PhD, University of Wisconsin

J. Malcolm Asplund, professor of animal science, PhD, University of Wisconsin

Margaret A. Flynn, professor of human nutrition/family and community medicine PhD, University of Missouri-Columbia

Fredric A. Martz, professor of dairy science, PhD, Purdue University

Boyd L. O'Dell, professor of biochemistry, PhD, University of Missouri-Columbia

James E. Savage, professor of poultry science, PhD, University of Missouri-Columbia

Trygve L. Veum, professor of animal science, PhD, Cornell University

Robert L. Wixom, professor of biochemistry, PhD, University of Illinois

Richard Dowdy, associate professor of human nutrition, foods and food systems management, PhD, North Carolina State University-Raleigh

GRADUATE DEGREES OFFERED

MS in nutrition area program

PhD In nutrition area program

The area program in nutrition, an interdisciplinary program leading to a master of science or a PhD, is designed to provide a foundation in many scientific aspects of nutrition. This is accomplished by core courses on which a student builds a graduate program. Research is conducted on the Columbia campus in several departments: animal science, dairy science and poultry science from the College of Agriculture; human nutrition, foods and food systems management from the College of Home Economics; veterinary anatomy-physiology from the College of Veterinary Medicine, and biochemistry in the College of Agriculture and the School of Medicine.

Students may concentrate in one of these areas of experimental nutrition: human, swine, poultry, ruminant and laboratory animals. A student also may concentrate on studies involving a specific nutrient in several species of animals.

Chemical laboratories and animal facilities enable students to conduct basic and applied nutrition research. Analytical laboratories facilitate research, and radioactive and stable isotopes can be used through the facilities in several laboratories, as well as through the whole body radiation detector facility. The Animal Science building provides modern research facilities for both chemical and animal research.

All of the major journals in the field of nutrition are in the libraries on campus.

The U.S. Department of Agriculture, Public Health Service, and Energy Research and Development Administration, as well as state and private sources, provide research support. Fellowships and assistantships are available through departments represented in the area. Apply to the director of graduate studies of the area of nutrition, or to the department in which one plans to do nutrition research.

PATHOLOGY AREA

FACULTY

Lawrence G. Morehouse, area chairperson, professor of veterinary pathology, interim chairperson, Department of Veterinary Pathology; DVM, Kansas State University, PhD, Purdue University

Steven G. Pueppke, chairperson and professor of plant pathology; PhD, Cornell University

John F. Townsend, chairperson, professor of pathology, MD, University of Missouri-Columbia

Om P. Sehgal, director of graduate studies, professor of plant pathology, PhD, University of Wisconsin

Merson F. Brown Jr., professor of plant pathology, PhD, University of Iowa

Oscar H. Calvert, professor of plant pathology, PhD, University of Wisconsin

Victor H. Dropkin, professor of plant pathology, PhD, University of Chicago

LaMont W. Gaston, professor of pathology, MD, University of Kansas

Robert N. Goodman, professor of plant pathology, PhD, University of Missouri-Columbia

Loren D. Kintner, professor of veterinary pathology, DVM, Ohio State University, MS, University of Missouri-Columbia

Arlene P. Martin, professor of pathology/biochemistry, PhD, Rochester University

Daniel F. Millikan, professor of plant pathology, PhD, University of Missouri-Columbia

Stuart L. Nelson, professor of veterinary pathology, DVM, Ohio State University, PhD, Purdue University

Anton Novacky, professor of plant pathology, PhD, Czechoslovakia Academy of Sciences.

LeRoy D. Olson, professor of veterinary pathology, DVM, University of Minnesota, PhD, Purdue University

Einar W. Plam, professor of plant pathology, PhD, North Dakota State University

Donald A. Schmidt, professor of veterinary pathology, DVM, Michigan State University

Marie L. Vorbeck, professor of pathology/biochemistry, PhD, Cornell University

Joseph E. Wagner, professor of veterinary pathology, DVM, Iowa State University, PhD, University of Illinois

Jack R. Wallin, professor of plant pathology, PhD, Iowa State University

Thomas D. Wyllie, professor of plant pathology, PhD, University of Minnesota

Edward H. Adelstein, associate professor of pathology, DVM, MD, MS, University of Missouri-Columbia

Arthur L. Karr Jr., associate professor of plant pathology, PhD, Colorado University

Darrell A. Kinden, associate professor of veterinary pathology, PhD, University of Missouri-Columbia

Alan Luger, associate professor of pathology, MD, Duke University

Ranadhir Mitra, associate professor of pathology, PhD, University of Missouri-Columbia

Chada S. Reddy, associate professor of veterinary biomedical sciences, BVSc Andhra Pradesh Agr. University, PhD, University of Mississippi

Wallace A. Rogers, associate professor of pathology, MD, University of Minnesota

Larry P. Thornburg, associate professor veterinary pathology, DVM, Texas A & M University, PhD, North Carolina-Chapel Hill

Linda E. Ansbacher, assistant professor of veterinary pathology, MD, University of Kansas
Linda L. Collier, assistant professor of veterinary pathology, DVM, Cornell University, PhD, Washington State University

Gary S. Johnson, assistant professor of veterinary pathology, DVM, Kansas State University, PhD, University of Minnesota

Ann B. Kier-Schroeder, assistant professor of veterinary pathology, DVM, PhD, University of Missouri-Columbia

James A. Wrather, assistant professor of plant pathology, PhD, University of Missouri-Columbia

GRADUATE DEGREES OFFERED

PhD in pathology area program

The PhD area program in pathology is jointly staffed by faculty from the Departments of Pathology (School of Medicine), Veterinary Pathology (College of Veterinary Medicine) and Plant Pathology (College of Agriculture).

The program is designed to provide students with the opportunity to examine and use research concepts and methods indigenous or specific to each of the three areas of pathology. In its approach to comparative pathology, the program allows the opportunity to obtain training in breadth or in depth in studies of disease mechanisms or processes in various host species.

Joint committee appointments and cooperative efforts in course offerings create an atmosphere for meaningful interdisciplinary dialogue and research cooperation among graduate students and faculty of the existing pathology departments. This is further implemented through an advisory committee composed of one member from each pathology department.

PhD candidates may choose their plans of research to take advantage of the inter-

ests and specialties of the various PhD advisers. Among these research areas are ultrastructure research, membrane transport systems, enzymology, electron transport systems in tissues, oncology, host cell-pathogen relationships, epidemiology, crop pest management, and pathogenesis of avian and mammalian disease (companion animal, food-producing animal, and spontaneous disease of laboratory animals).

In addition to standard equipment suitable for research in each pathology area, special items in the various departments include: Six electron microscopes, chromatographic equipment (gas-liquid, column, paper, thin-layer and HPLC), spectrophotometers, low-high speed ultracentrifuges, electrophoresis apparatuses, Warburg respirometers, liquid scintillation and thin window radioisotope counters, ultra-microtomes, radiometer blood gas analyzer.

Facilities also include necropsy and clinical pathology laboratories for supportive course work (medical and veterinary pathology); research laboratories in medical, plant and veterinary medical pathology; and two research farms.

Various stipends are available, including teaching assistantships and postdoctoral fellowships. Write to the chairperson if the specific pathology department for application forms.

DEGREE REQUIREMENTS

To be considered for admission to the PhD area program in pathology, an applicant should hold the MS degree in plant pathology or a closely related field of biological science, or be a graduate with a degree of MD, DVM or DDS.

An applicant should take Part I (general aptitude) of the GRE before entering Graduate School or during the first semester of graduate study (applicants for plant pathology should also complete the advanced GRE in biological science); furthermore, students must pass a qualifying examination for admission to candidacy.

Students with less than 3.0 GPA (bases upon a maximum of 4.0) and/or combined verbal and quantitative GRE aptitude tests below 1100 could only be admitted under probationary status. Such admission would require approval by Executive Committee of the area program.

A student's course of study includes a core curriculum which must be completed before graduation. These subjects are not requirements for admission. If adequate evidence is established for prior work in these areas, or their equivalents, they need not be repeated.

The core curriculum should include: a basic course in microbiology and an advanced course in virology, bacteriology, mycology, or immunology, depending on the interests of the student; an introductory course and two advanced courses in biochemistry, or one advanced course in biochemistry and a semester of physical chemistry; one basic and one advanced

course in genetics; Mathematics 80 or an acceptable equivalent; one course in genetics; Mathematics 80 or an acceptable equivalent; one course in scientific instrumentation. The student is referred to the chairperson of specific department for additional information on course curriculum including minimum pathology course requirements.

Abilities developed in the preparation of the required dissertation should include logical thought regarding technical aspects of pathology and areas to which it relates, planning and conducting of independent objective research investigations, and the ability to communicate scientific results in writing.

PHYSICAL SCIENCE

The master of science-physical science degree is designed primarily for junior college teachers, and emphasizes broad training in physics, chemistry and mathematics. For degree requirements, refer to the section on *Regulations for Master's Degree Programs*.

PHYSIOLOGY AREA

FACULTY

Travis E. Solomon, associate professor of physiology, chairperson, associate chief of staff-research, Truman Veterans Hospital, MD, PhD, University of Texas-Houston

Ralph R. Anderson, professor of dairy science, PhD, University of Missouri-Columbia

Harold V. Biellier, professor of poultry science, PhD, University of Missouri-Columbia

Venkateshu K. Ganjam, professor of veterinary anatomy-physiology, B.V. Sc., S. V. University, India, PhD, Oklahoma State University

Harold E. Garner, professor of veterinary medicine and surgery, DVM, Kansas State University, PhD, Baylor University

Douglas M. Griggs, professor of physiology, MD, University of Virginia

Allen W. Hahn, professor of veterinary medicine and surgery, investigator, Dalton Research Center, DVM, University of Missouri-Columbia, PhD, Drexel University

Harold D. Johnson, professor of dairy science, PhD, University of Missouri-Columbia

Allan W. Jones, professor of physiology, PhD, University of Pennsylvania

J. Ricardo Martinez, professor of child health/physiology, MD, University of Tulane

Charles P. Merilan, professor of dairy science, PhD, University of Missouri-Columbia

Donald H. York, professor of physiology, PhD, Monash University, (Australia)

Marvin L. Zatzman, professor of physiology, PhD, Ohio State University

Ronald H. Freeman, associate professor of physiology, PhD, University of Indiana

J. Alan Johnson, associate professor of physiology, research physiologist, Truman Memorial Hospital, PhD, University of Indiana

Benjamin R. Londeree, associate professor of health and physical education, EdD, University of Toledo

GRADUATE DEGREES OFFERED

MS in physiology area program

PhD in physiology area program

The physiology area program offers graduate study leading to the degrees of master of science and doctor of philosophy in the physiology area program. Graduate programs in the area are designed to provide in-depth training to meet the needs of the individual student. The area affords a unique opportunity to explore

the relationships between several specialized fields of physiology.

The area faculty includes members from the Departments of Dairy Science and Poultry Science (College of Agriculture); Health and Physical Education (College of Education); Physiology (School of Medicine); and Veterinary Anatomy-Physiology and Veterinary Medicine and Surgery (College of Veterinary Medicine).

Specialties and interests include avian physiology, bioengineering, bioenergetics, bioinstrumentation, cardiac metabolism, circulatory physiology, cystic fibrosis, endocrinology, environmental physiology, equine physiology, exercise physiology, exocrine gland physiology, gastrointestinal physiology, hypertension, hypothermia-hibernation, lactation, neurophysiology, renal physiology, reproductive physiology, smooth muscle, and water and electrolyte metabolism

Specialized major facilities include the Nuclear Reactor, Low Level Radiation Laboratory, Sinclair Comparative Medical Research Farm, Dalton Research Center, the Climatic Laboratory, and the Research Service of the Truman Veterans Hospital. Also, extensive basic research instrumentation and facilities are available in the member departments.

REGIONAL SCIENCE AREA

FACULTY

Richard R. Dohm, chairperson, associate professor of political science, PhD, University of Minnesota.

The option of a minor in regional science is offered to master's and PhD degree candidates in the departments of anthropology, agricultural economics, economics, geography, industrial engineering, political science, community development, rural sociology and sociology. Candidates take 12 hours of electives chosen from a list approved by the regional science committee and from at least three departments other than the major department.

Students interested in pursuing this minor should contact the regional science adviser in their department. In the absence of other information, contact Dr. Richard Dohm, Regional Science Committee, 306 Watson Pl., UMC, Columbia, Mo. 65211.

SOUTH ASIA LANGUAGE AND AREA STUDIES

FACULTY

Bina Gupta, associate professor philosophy and South Asian languages, director, PhD, University of Southern Illinois

Robert Bussabarger, professor of art, MA, Michigan State University

Douglas Ensminger, professor of rural sociology, PhD, Cornell University

Peter Gardner, professor of anthropology, PhD, University of Pennsylvania

Arthur Robins, professor of psychiatry, PhD, University of Minnesota

Paul Wallace, professor of political science, PhD, University of California-Berkeley

Joel Breerton, associate professor of religious studies, PhD, Yale University

William A. Noble, associate professor of geography, PhD, Louisiana State University
Forrest McGill, director, Museum of Art and Archaeology, PhD, University of Michigan-Ann Arbor
Murari L. Nagar, South Asian librarian, DLS, Columbia University

The South Asia Language and Area Center provides a focus for a student who wishes to pursue specialization in South Asian studies at the MA or PhD level. Graduate degrees are pursued through the departments which relate to the center. In addition to the graduate degree, a certificate of specialization is awarded in conjunction with degrees in specific disciplines.

The participating departments are: Agriculture, Anthropology, Education, Geography, History, Philosophy, Political Science, Rural Sociology, Sociology and Social Work. The South Asian languages offered are Hindi and Sanskrit.

The South Asia program at UMC formally was designated a Language and Area Center under the National Defense and Education Act in 1965. In addition, the University is a member of the American Institute of Indian Studies, a consortium and funding agency for the leading South Asia Centers in this country.

Individual departments offer financial assistance. The library has been developed under the supervision of a professional South Asian librarian. The library is a recipient of books published in South Asia under the P.L. 480 program. Particularly notable is the broad selection of books and microfilm on the Punjab area of South Asia. A collection of South Asian works of art is located in the University Museum.

DEGREE REQUIREMENTS

Students must fulfill the degree requirements of the department through

which they pursue their graduate degrees, and are expected to prepare themselves in language and area subjects, in addition to departmental requirements. Remaining requirements are established so as to provide maximum flexibility to the student's goals and prior training. The object is to provide both depth and breadth, and a meaningful exposure to the area on an interdisciplinary basis. Advisors may also require additional courses to supplement the candidate's undergraduate preparation in Asian studies.

Minimum South Asian courses for the MA degree are two years of a South Asian language and one minor field in South Asia (minimum 6 credits).

PhD candidates must complete at least three years of a South Asia language, a minor field (minimum of 6 credits), and 6 elective credits in courses to be chosen from outside the major and minor fields.



STATEMENT OF COURSES

ACCOUNTANCY

- 200 Independent Readings (1-3).
- 236 Financial Accounting I (3).
- 237 Cost Accounting (3).
- 246 Financial Accounting II (3).
- 258 Computer-Based Data Systems (3).
- 268 Accounting Information Systems (3).
- 273 Introduction to Taxation (3).
- 301 Problems in Accounting (1-3).
- 304 Managerial Accounting Concepts (3).
- 305 Financial Accounting Concepts (3).
- 310 Managerial Accounting (3).
- 316 Accounting Principles I (3).
- 317 Accounting Principles II (3).
- 325 Governmental Accounting and Budgeting (3).
- 336 Advanced Financial Accounting (3).
- 337 Managerial Accounts and Statistics (3).
- 358 EDP Systems Analysis and Design (3).
- 368 EDP Systems Management and Control (3).
- 373 Intermediate Taxation (3).
- 384 Auditing (3).
- 401 Problems in Accounting (1-3).
- 403 Controllership (3).
- 406 Advanced Accounting Practice (3).
- 407 Tax Theory and Practice (3).
- 408 Current Topics in Data Processing (3).
- 409 Auditing Theory and Practice (3).
- 423 Advanced Taxation I (3).
- 425 Accounting for Governments and Other NonProfit Entities (3).
- 428 Advanced Business Programming (3).
- 436 Financial Accounting Theory I (3).
- 437 Advanced Cost Accounting (3).
- 444 Seminar in Auditing (3).
- 446 Application of Financial Accounting Pronouncements (3).
- 448 Seminar in Information Systems (3).
- 450 Accounting Policy (3).
- 453 Advanced Taxation II (3).
- 455 Seminar in Governmental Auditing (3).
- 457 Quantitative Methods in Accounting (3).
- 460 Research Methods in Accounting (3).
- 466 Financial Accounting Theory II (3).
- 467 Advanced Managerial Accounting (3).
- 468 Advanced Accounting Systems (3).
- 489 Cultural Significance of Accounts (3).
- 491 Research in Accounting (cr. arr.)

AGRICULTURAL ECONOMICS

- 200 Problems (cr. arr.)
- 220 General Agricultural Marketing (3).
- 225 Statistical Analysis (3).
- 230 Farm Programs (3).
- 241 Cooperative Business Organizations (3).
- 250 Economics of Agricultural Production and Distribution (3).
- 251 Agricultural Prices (3).
- 260 General Farm Management (3).
- 270 Resources and Economic Development (3).
- 271 International Agricultural Development (3).
- 280 Financing the Farm Business (3).
- 290 Marketing Farm Commodities: Theory and Practice (1).
- 291 Marketing Farm Commodities: Livestock and Livestock Products (2).
- 294 Marketing Farm Commodities: Grain Crops (2).
- 299 Senior Seminar (1).
- 301 Topics in Agricultural Economics (1-6).
- 310 In-Service Course in Agricultural Economics (2-10).
- 312 Planning the Farm Business (3).
- 314 Farm Business Analysis (3).
- 320 Agricultural Business Management (3).
- 321 Economic History of Agriculture (3).
- 332 Agricultural Policy (2).
- 333 Agricultural Law (3).
- 338 Rural Real Estate Appraisal (3).
- 355 Economics of Agricultural Production and Distribution (3).
- 386 Development and Management of Natural Resources (3).
- 390 Field Training (cr. arr.)
- 400 Problems (cr. arr.)
- 410 Seminar (1).
- 420 Theory of Markets (3).
- 422 Organizing and Adjusting the Farm Business (3).
- 424 Advanced Production Economics (3).
- 430 Advanced Price Analysis (3).
- 435 Advanced Farm Management (3).
- 450 Research (cr. arr.)
- 451 Economics of Marketing Livestock and Livestock Products (3).

- 454 Welfare and Consumption Economics (3).
- 458 Economics of Marketing (3).
- 465 Current Economic Aspects of Agriculture (3).
- 468 Resource Economics and Development (3).
- 472 International Agricultural Development Policy (3).
- 475 Econometrics I (3).
- 476 Econometrics II (3).
- 480 Research Methodology (3).
- 485 Advanced Topics in Economics (3).
- 490 Research (cr. arr.)

AGRICULTURAL ENGINEERING- AGRICULTURE

- 201 Farm Water Management (3).
- 202 Agricultural Practices and Pollution Control (3).
- 210 Advanced Shopwork (2).
- 215 Electricity on the Farm (3).
- 240 Farm Machinery (3).
- 250 Physical Principles for Food Processing (3).
- 300 Problems (1-5).
- 301 Topics in Agricultural Mechanization (3).
- 306 Crop Drying and Conditioning (3).
- 310 In-Service Course in Agricultural Mechanization (1-8).
- 320 Farm Drainage and Irrigation (3).
- 330 Human Safety in Agriculture (3).
- 338 Rural Real Estate Appraisal (3).
- 363 Mechanization Systems Management (2).
- 386 Mechanized Feed Handling (3).
- 391 Engineering Internship (2-5).
- 452 Advanced Machinery Management Topics (3).

AGRICULTURAL ENGINEERING- ENGINEERING

- 203 Environmental Control of Farm Buildings (3).
- 221 Soil Conservation Engineering (3).
- 241 Analysis of Farm Machines (3).
- 267 Agricultural Hydraulic System Design (1).
- 300 Problems (1-5).
- 301 Topics in Agricultural Engineering (3).
- 302 Design of Livestock Waste Management Systems (3).
- 303 Farm Buildings Design (3).
- 305 Agricultural Engineering Measurements (3).
- 315 Farm Electrification Engineering (3).
- 316 Crop Processing (3).
- 321 Irrigation and Drainage Engineering (3).
- 340 Advanced Farm Power and Machinery (3).
- 350 Honors Thesis Research (2-4).
- 390 Agricultural Engineering Design (3).
- 391 Engineering Internship (3).
- 400 Problems (cr. arr.)
- 401 Advanced Topics in Agricultural Engineering (1-3).
- 403 Advanced Farm Buildings (3).
- 410 Seminar (1).
- 412 Research Methods (1).
- 416 Agricultural Processing Engineering (3).
- 421 Water Management Theory (3).
- 435 Similitude in Engineering (3).
- 440 Mechanical Farm Equipment (3).
- 490 Research (cr. arr.)

AGRONOMY

- 201 Topics in Agronomy (1-4).
- 202 International Agronomy (2).
- 203 Forage Crops (3).
- 204 Grain Crops (3).
- 209 Weed-Crop Ecology (3).
- 213 Soil Testing and Evaluation (2).
- 225 Basic Plant Genetics (3).
- 230 Crops and Soils Management (0-3).
- 300 Problems (cr. arr.)
- 301 Topics in Agronomy (1-4).
- 302 Fertilizer Technology and Use (3).
- 307 Physical Properties of Soils (5).
- 308 Soil Conservation (3).
- 309 Herbicides in Agronomic Habitats (3).
- 312 Soil Microbiology (3).
- 313 Soil Fertility and Plant Nutrition (3).
- 314 Soil Fertility and Plant Nutrition Laboratory (2).
- 315 Crop Physiology (3).
- 319 Soil Chemistry (3).
- 320 Soil Genesis, Mapping and Classification (4).
- 322 Diseases of Field Crops (2).
- 325 Field Crop Breeding (3).
- 327 Plants Tissue Culture (3).
- 328 Genetic Engineering (1).
- 329 Soil Chemistry Laboratory (2).
- 330 Plant Breeding Theory (3).
- 343 Evolution of Genetic Concepts (2).
- 350 Special Readings (1-3).
- 384 Cytogenetics (3).

- 385 Cytogenetics Laboratory (1).
- 400 Problems (cr. arr.)
- 401 Topics in Agronomy (1-4).
- 407 Soil Physics (3).
- 409 Weed Research Principles and Techniques (2).
- 410 Seminar (1).
- 414 Advanced Soil Fertility (3).
- 415 Advanced Crop Physiology (3).
- 416 Transport and Metabolism of Plant Nutrients (3).
- 419 Physical Chemistry of Soils (3).
- 425 Development of Plant Breeding Concepts (3).
- 440 Applied Quantitative and Statistical Genetics (3).
- 445 Cytogenetics in Crop Breeding (3).
- 450 Nonthesis Research (cr. arr.)
- 490 Thesis Research (cr. arr.)

ANATOMY

- 202 Elementary Anatomy (5).
- 204M Medical Development and Gross Anatomy (10).
- 205M Medical Gross Anatomy and Development (10).
- 207M Medical Histology (4).
- 240M Neurosciences I (5).
- 300 Problems (cr. arr.)
- 301 Human Developmental and Gross Anatomy (10).
- 304 Human Histology and Organology (4).
- 305 Anatomy of the Human Nervous System (3).
- 306 Autonomic Nervous System (2).
- 308 Hematopoietic Organs (2).
- 312 Biology of the Endocrine Organs of Man I (2).
- 313 Biology of the Endocrine Organs of Man II (2).
- 405 Mammalian Reproduction (3).
- 410 Seminar (1).
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)

ANIMAL SCIENCES

- 200 Problems (1-2).
- 202 Principles of Animal Nutrition (3).
- 204 Advanced Meats (3).
- 212 Applied Nutrition (3).
- 213 Genetics of Livestock Improvement (3).
- 214 Meat Classification, Grading, Judging (2).
- 235 Poultry Production (3).
- 275 Advanced Livestock Selection and Evaluation (2).
- 285 Advanced Dairy Cattle Judging (2).
- 300 Problems (cr. arr.)
- 302 Monogastric Nutrition (3).
- 304 Physiology of Reproduction (4).
- 305 Beef Production and Management (3).
- 315 Advanced Dairy Production (3).
- 323 Applied Animal Genetics (3).
- 325 Horse Production (3).
- 335 Advanced Poultry Production (3).
- 345 Sheep Production and Management (3).
- 355 Swine Production (3).
- 383 Bovine Breeding (3).
- 384 Artificial Breeding (3).
- 390 Internship in Animal Science & Technology (1-12).
- 391 Field Training (3).
- 394 Semen and Ova Processing (3).
- 400 Problems (1-2).
- 401 Livestock Production and Management Research Methods (3).
- 402 Animal Nutrition (3).
- 410 Seminar (1).
- 411 Livestock Feeding Investigations (2).
- 413 Reproductive Biology Seminar (1).
- 423 Genetics of Populations (4).
- 430 The Development, Growth and Organization of Colleges of Agricultr (1).
- 432 Ruminant Nutrition (3).
- 440 Topics in Animal Science (cr. arr.)
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)

ANTHROPOLOGY

- 201 Topics in Anthropology (1-3).
- 228 Cultures of Africa (3).
- 229 Cultures of Asia (3).
- 230 North American Indians Today (3).
- 234 Cultures of Mexico and Guatemals (3).
- 235 Cultures of Native America (3).
- 236 Eastern North American Indian Culture (3).
- 240 Ancient American Civilization (3).
- 259 Cultures of South ASia (3).
- 260 The Third World: An Anthropological Perspective (3).
- 261 Cultures of Europe (3).
- 265 Male and Female (3).
- 270 Culture and Communication (3).
- 280 Seminar in Anthropology (3).

290 Culture and Thought (3).
 298 Honors in Anthropology (3).
 299 Honors in Anthropology (3).
 306 Sociolinguistics (3).
 308 Historical Linguistics (3).
 310 Ethnographic studies of selected Cultures (3).
 323 Medical Anthropology (3).
 324 Preindustrial Technology (3).
 325 Political Anthropology (3).
 326 Advanced Cultural Anthropology (3).
 328 Psychological Anthropology (3).
 332 Comparative Social Organization (3).
 333 Sociocultural Change in Modern Africa (3).
 336 Ethnobiology (3).
 338 Historical American Archaeology (2-3).
 339 Field Research in Historical American Archaeology (3).
 340 North American Archaeology (3).
 341 Archaeology of South America (3).
 342 Field Methods in Archaeology (1-8).
 344 Prehistory of Mexico (3).
 345 History of Anthropology (3).
 346 Language and Culture (3).
 347 Neolithic, Bronze and Iron Age Archaeology (3).
 348 Far Eastern Prehistory (3).
 349 Topics in Anthropology (3).
 350 Special Readings in Anthropology (cr. arr.)
 352 Problems in Anthropological Metatheory (3).
 353 Prehistory of the Maya (3).
 354 Human Osteology (3).
 355 Human Skeletal Identification (3).
 357 Pre-Pleistocene Primate Evolution (3).
 362 Cultural Evolution and Change (3).
 363 Theories in Social Anthropology (3).
 364 Human Origins (3).
 365 Economic Anthropology (3).
 366 Human Biological Variation (3).
 367 Ethnographic Methods (3).
 368 Old World Prehistory (3).
 369 Primate Social Behavior (3).
 371 Introduction to General Linguistics (3).
 372 Techniques in Linguistic Analysis (3).
 373 Linguistic Phonetics (3).
 374 Issues in Linguistic Analysis (3).
 385 Research (2-8).
 393 Field Methods in Linguistics (4).
 400 Problems (cr. arr.)
 420 Independent Reading in Preparation for Comprehensive Exam for PhD (1-8).
 436 Seminar in Anthropological Methods (3).
 437 Seminar in Ethnohistory (3).
 442 Field Problems in Archaeology (2-8).
 443 Seminar in Theory and Methods in Archaeology (3).
 444 Seminar in Archaeological Research (3).
 446 Seminar in Anthropological Linguistics (3).
 449 Topics in Anthropology (3).
 450 Non Thesis Research (cr. arr.)
 451 Problems in Physical Anthropology (2-8).
 452 Seminar in Physical Anthropology (3-6).
 453 Seminar in Classic Questions in Physical Anthropology (3).
 461 Seminar in Psychological Anthropology (3).
 462 Seminar in Cultural Dynamics (3).
 463 Seminar in Comparative Social Organization (3).
 465 Seminar in Ethnological Theory (3).
 466 Seminar in Ecological Adaptation (3).
 468 Seminar in Old World Archaeology (3).
 469 Seminar in Formal Anthropological Research Design (3).
 490 Research (cr. arr.)
 493 Phonology (3).
 494 Syntax (3).

ART

CERAMICS

230 Beginning Ceramics (3).
 330 Intermediate Ceramics (3).
 331 Advanced Ceramics (3).
 332 Ceramics Sculpture (3).
 430 Graduate Ceramics (3).
 431 Graduate Ceramic Sculpture (3).

COMPOSITION

270 Experimental Media I (3).
 370 Experimental Media II (3).
 371 Experimental Media III (3).
 470 Experimental Media IV (3).

DESIGN

220 Beginning Spatial Design (3).
 221 Space, Form and Structure (3).
 315 Advanced Color Theory (3).
 320 Space, Light and Color (3).
 321 Advanced Spatial Design (3).
 421 Graduate Spatial Design (3).

DRAWING

260 Intermediate Drawing (3).
 265 Anatomical Drawing (3).
 360 Advanced Drawing (3).
 460 Graduate Drawing (3).

FIBERS

240 Intermediate Fibers (3).
 340 Advanced Fibers (3).
 440 Graduate Fibers (3).

GRAPHIC DESIGN

210 Introduction to Calligraphy (3).
 222 Graphic Design I (3).
 223 Graphic Design II (3).
 310 Advanced Calligraphy (3).
 323 Graphic Design III (3).
 324 Graphic Design IV (3).
 422 Graphic Design V (3).

JEWELRY

251 Jewelry I (3).
 351 Basic Casting (3).
 450 Graduate Seminar in Metals (3).

METALS

250 Beginning Metals (3).
 350 Basic Casting (3).
 351 Enameling (3).
 352 Raising (3).
 353 Advanced Techniques in Metals (3).
 450 Graduate Seminar in Metals (3).

PAINTING

277 Intermediate Painting (3).
 377 Advanced Painting (3).
 477 Graduate Painting (3).

PHOTOGRAPHY

225 Beginning Photography (3).
 325 Intermediate Photography (3).
 425 Graduate Photography (3).

PRINTMAKING

290 Relief Printmaking (3).
 291 Intaglio Printmaking (3).
 292 Lithography (3).
 390 Advanced Printmaking (3).
 490 Graduate Printmaking (3).

PROBLEMS

300 Problems in Art (1-3).
 301 Topics (4).
 402 Graduate Collaboration (1-4).
 403 Historic Research in Drawing, Painting and Design (1-4).
 410 Graduate Studio Seminar (3).
 424 Problems in Design (1-12).
 429 Problems in Photography (1-12).
 434 Problems in Ceramics (1-12).
 444 Problems in Fibers (1-12).
 454 Problems in Metals (1-12).
 456 Historic Research in Artcrafts (1-4).
 464 Problems in Drawing (1-12).
 474 Problems in Experimental Media (1-12).
 479 Problems in Painting (1-12).
 489 Problems in Sculpture (1-12).
 494 Problems in Printmaking (1-12).
 499 Problems in Serigraphy (1-12).

SCULPTURE

285 Beginning Sculpture (3).
 385 Intermediate Sculpture (3).
 386 Wood and Stone Carving (3).
 387 Sculpture in Plastics (3).
 388 Sculptural Welding and Metal Casting (3).
 485 Advanced Sculptural Composition (3).

SERIGRAPHY

296 Serigraphy I (3).
 396 Serigraphy II (3).
 496 Graduate Serigraphy (3).

WATERCOLOR

275 Intermediate Water Color (3).
 375 Advanced Water Color (3).
 475 Graduate Water Color (3).

WEAVING

240 Intermediate Fibers (3).

ART HISTORY AND ARCHAEOLOGY

201 Topics in Art History and Archaeology (1-3).
 217 Introduction to Near Eastern Art & Archaeology (3).
 218 Introduction to Biblical Archaeology (3).
 219 Art and Archaeology of Ancient Egypt (3).
 220 Classical Art and Archaeology I: Greece (3).
 221 Classical Art and Archaeology II: Rome (3).
 222 Ancient Technology (3).
 240 Early Medieval Art (3).
 241 Late Medieval Art (3).
 250 Italian Renaissance Art (3).
 251 Northern Renaissance Art (3).
 260 Baroque Art (3).
 261 Eighteenth Century European Art (3).
 270 Nineteenth Century European Art (3).
 271 Twentieth Century European Art (3).
 272 Twentieth Century American Art (3).
 290 Honors Proseminar I (3).
 291 Honors Proseminar II (3).
 292 Honors Reading and Research I (3).
 293 Honors Reading and Research II (3).
 300 Problems (cr. arr.)
 301 Topics in Art History and Archaeology (cr. arr.)
 302 Art and Literature (3).
 304 Art and Archaeology of Syria-Palestine (3).
 306 European Art and Archaeology I (3).
 307 European Art and Archaeology II (3).
 308 Ancient Painting I: Greece (3).
 309 Ancient Painting II: Italy (3).
 310 Ancient Sculpture I: Greece (3).
 311 Ancient Sculpture II: Italy (3).
 312 Ancient Architecture I: Greece (3).
 313 Ancient Architecture II: Italy (3).

314 Archaeological Methods (2-6).
 315 Near Eastern Art and Archaeology I: Before 3000 B.C. (3).
 316 The Greeks Abroad (3).
 317 Aegean Archaeology (3).
 323 Greek and Roman Numismatics I (3).
 324 Greek and Roman Numismatics II (3).
 325 Greek Epigraphy (3).
 326 Latin Epigraphy (3).
 330 Roman Provincial and Early Christian Art (3).
 336 Art of the Dark Ages (3).
 341 Byzantine Art and Archaeology (3).
 342 Romanesque Art and Architecture (3).
 343 Gothic Art and Architecture (3).
 350 Michelangelo and the High Renaissance (3).
 351 Renaissance and Baroque Architecture (3).
 352 Renaissance Figural Arts II: Northern Europe (3).
 360 Rembrandt and Baroque Art (3).
 361 Rococo to Romanticism (3).
 362 Realism-Through Post-Impressionism (3).
 364 Material Folk Culture (3).
 365 American Architecture (3).
 370 Contemporary Art (3).
 371 Modern Architecture (3).
 375 Historic Preservation (3).
 376 Topics in Museum Studies (3).
 401 Introduction to Graduate Study (3).
 402 Historiography of Art and Archaeology (3).
 404 Art Theory and Criticism (3).
 406 Archaeology of the Ancient Near East (3).
 409 Seminar in Aegean Art and Archaeology (cr. arr.)
 410 Seminar in Greek Art and Archaeology (cr. arr.)
 411 Seminar in Roman Art and Archaeology (cr. arr.)
 412 Greek Sanctuaries (3).
 414 Monuments and Topography of Athens (3).
 415 Monuments and Topography of Rome (3).
 420 Seminar in Medieval Art and Archaeology (cr. arr.)
 425 Seminar in Late Medieval Art (cr. arr.)
 430 Seminar in Renaissance Art I: Italy (cr. arr.)
 440 Seminar in Baroque Art (cr. arr.)
 441 Venetian Painting (3).
 451 Seminar in Modern Art (cr. arr.)
 452 Seminar in Modern Architecture (cr. arr.)
 453 British Art of the Eighteenth Century (3).
 454 Nineteenth Century Painting (3).
 460 Seminar in American Art (cr. arr.)
 470 Introduction to Museum Studies (3).
 471 Curatorial Care of Collections II (3).
 472 Museum Training I (1-6).
 480 Readings (cr. arr.)
 490 Research and Thesis (cr. arr.)

ATMOSPHERIC SCIENCE

200 Independent Study in Atmospheric Science (1-3).
 301 Topics in Atmospheric Science (cr. arr.)
 302 Weather Briefing (1).
 303 Meteorology of the Biosphere (3).
 304 Meteorological Analysis I (3).
 305 Meteorological Analysis II (3).
 314 Cloud and Precipitation Physics (3).
 316 Micrometeorology (3).
 350 Fundamentals of Meteorology (3).
 366 Climates of the World (3).
 377 Climate Dynamics (3).
 390 Internship in Meteorology (1-6).
 392 Atmospheric Thermodynamics and Statics (5).
 393 Atmospheric Kinematics and Dynamics (5).
 400 Problems (cr. arr.)
 401 Topics in Atmospheric Science (cr. arr.)
 402 Radiation in the Atmosphere (3).
 410 Seminar (cr. arr.)
 412 Advanced Dynamic Meteorology (3).
 416 Atmospheric General Circulation (3).
 420 Meteorological Statistics (3).
 466 Advanced Dynamic Climatology (3).
 490 Research (cr. arr.)

BIOCHEMISTRY

206 Medical Biochemistry (8).
 240M Neurosciences I (5).
 270 Biochemistry (3).
 272 Biochemistry (3).
 274 Biochemistry Laboratory (4).
 299 Seminar (1).
 300 Problems (1-3).
 301 Topics in Biochemistry (cr. arr.)
 304 General Biochemistry Lectures (5).
 310 Trace Analysis (3).
 312 Instrumental Methods of Analysis (4).
 371 Enzymology and Metabolic Regulation (3).
 372 Physical Biochemistry (3).
 400 Problems (1-6).
 401 Plant Biochemistry (3).
 403 Topics in Biochemistry (2-3).
 410 Seminar (1).
 413 Reproductive Biology Seminar (1).
 422 Analytical Biochemistry--Chromatography (2).
 423 Analytical Biochemistry--Multiple Automatic Microanalysis (1).
 424 Analytical Biochemistry--Mass Spectrometry (2).
 430 Biochemical Genetics (3).
 450 Research (2-8).

- 461 Advanced Carbohydrate Metabolism and Biological Oxidations (2).
 462 Advanced Metabolism: Proteins and Nucleic Acids (2).
 463 Advanced Lipid Metabolism (2).
 464 Physical Biochemistry: Proteins, Enzymes, Nucleic Acids (2).
 465 Advanced Metabolism: Amino Acids (2).
 466 Regulation of Energy Metabolism (2).
 477 Crossroads in Biological Chemistry (2).
 490 Research (cr. arr.)

BIOLOGICAL SCIENCES

- 202 General Genetics (3).
 203 Introduction to Cell Biology (3).
 204 General Entomology (3).
 205 Developmental Biology (3).
 207 Plant Growth and Development (3).
 210 Parasitology (4).
 212 Basic Microbiology (4).
 213 Comparative Anatomy of Vertebrates (5).
 214 Plant Taxonomy (4).
 222 Vertebrate Embryology (5).
 230 Invertebrate Zoology (5).
 238 Basic Genetics I (3).
 239 Basic Genetics II (3).
 241 Genetics Laboratory (2).
 250 Community Biology (3).
 270 Vertebrate Physiology (5).
 275 Introduction to the Nervous System (3).
 295 Honors Research in Biology (2-3).
 296 Honors Research in Biology (2-3).
 297 Honors Colloquium in Biology (1).
 298 Honors Colloquium in Biology (1).
 299 Honors Proseminar in Biology (2-3).
 300 Problems in Biological Sciences (cr. arr.)
 301 Topics in Biological Sciences (cr. arr.)
 302 Evolution (3).
 303 Systematic Bacteriology (2).
 304 Systematic Entomology (3).
 305 General Phycology (3).
 306 Aquatic Botany (3).
 307 Mycology (4).
 308 Plant Anatomy (4).
 309 Mammalogy (4).
 311 Ichthyology (4).
 313 Plant Physiology (3-5).
 314 Agrostology (5).
 315 Paleobotany (3).
 316 Principles of Insect Physiology (4).
 317 Palynology (3).
 321 Marine Biology (3).
 322 Protozoology (3).
 323 Helminthology (4).
 324 Limnology (3-4).
 325 Herpetology (4).
 326 Analysis of Biological Macromolecules (3).
 328 Introductory Radiation Biology (3).
 330 Sensory Physiology (3).
 332 Physiological Ecology (3-4).
 333 Vertebrate Histology and Microscopic Anatomy (5).
 335 Mammalian Reproductive Biology (3).
 336 Introduction to Electron Microscopy (2).
 337 Mammalian Reproductive Biology Laboratory (2).
 340 Mammalian Cell Genetics (3).
 342 Behavioral Biology (3).
 343 Evolution of Genetic Concepts (2).
 344 Behavior Biology Laboratory (2).
 345 Animal Communication (3-5).
 346 Genetics of Microorganisms (3).
 348 Human Genetics (3).
 354 Advanced Bacteriology (3-5).
 360 Techniques in Cell Culture (4).
 362 General Ecology (5).
 366 Avian Ecology (3).
 371 Cellular Physiology (5).
 374 Cell Biology I (3-5).
 375 Cell Biology II (3).
 380 Cytology (4).
 384 Cytogenetics (3).
 385 Cytogenetics Laboratory (1).
 400 Problems in Biological Sciences (cr. arr.)
 401 Topics in Biological Sciences (cr. arr.)
 403 Physiological Responses to Environment (3).
 406 Terrestrial Ecosystems (3).
 407 Molecular Genetics Laboratory (4).
 408 Developmental Genetics (3).
 409 Plant Morphogenesis (2).
 410 Seminar (1).
 411 Seminar in Areas of Specialization (1).
 412 Seminar in Genetics (1).
 413 Workshop in Area of Specialization (1).
 414 Photosynthesis Lecture (2).
 415 Photosynthesis Laboratory (2).
 420 Endocrinology (3).
 421 Plant Geography (3).
 422 Ecological Genetics (4).
 423 Genetics of Populations (4).
 424 Molecular Biology of Bacteriophage (3).
 426 Neural Basis of Animal Behavior (3).
 428 Advanced Community Ecology (3).
 430 Speciation (2).
 434 Advanced Plant Taxonomy (2).
 435 Advanced Plant Taxonomy (3).

- 436 Comparative Endocrinology (3).
 452 The Biology of Nucleic Acids (3).
 490 Research in Biological Sciences (cr. arr.)

BUSINESS ADMINISTRATION

- 301 Organization Theory and Behavior (3).
 320 Computer Applications for Planning and Decision Making (3).
 324 Managerial Statistics (3).
 326 Information Systems for Planning and Decision Making (3).
 342 Production/Operations Management (3).
 344 Managerial Finance (3).
 346 Managerial Marketing (3).
 376 Business Policy (3).
 401 Topics Business Administration (cr. arr.)
 420 Managerial Decision Science (3).
 442 Business and Society (3).
 449 Business Environment and Policy (3).
 471 Behavioral Science in Business I (3).
 472 Behavioral Science in Business II (3).
 481 Research Design and Methodology (3).

CHEMICAL ENGINEERING

- 201 Topics in the Interrelation of Chemical Engineering and Society (3).
 204 Chemical Engineering Materials (3).
 225 Chemical Process Calculations (3).
 234 Principles of Chemical Engineering I (3).
 235 Principles of Chemical Engineering II (3).
 236 Principles of Chemical Engineering III (3).
 243 Chemical Engineering Laboratory I (2).
 244 Chemical Engineering Laboratory II (2).
 261 Chemical Engineering Thermodynamics I (3).
 262 Chemical Engineering Thermodynamics II (3).
 300 Problems (2-4).
 301 Topics in Chemical Engineering (3).
 304 Digital Computer Applications in Engineering (3).
 306 Engineering Analysis (3).
 311 Chemodynamics (3).
 312 Air Pollution Control (3).
 314 Biochemical Engineering Operation (3).
 315 Introduction to Biochemical Engineering (3).
 335 Transport Phenomena (3).
 337 Chemical Reactor Systems Design (4).
 345 Special Reading (2-5).
 350 Research for Honor Students (3-6).
 363 Chemical Reaction Engineering and Technology (3).
 370 Modern Methods of Chemical Process Control (3).
 385 Chemical Engineering Design I (3).
 386 Chemical Engineering Design II (3).
 387 Process Analysis and Simulation (3).
 391 Radioisotope Techniques (3).
 400 Problems (1-5).
 401 Advanced Topics in Chemical Engineering (3).
 408 State Variable Methods in Automatic Control (3).
 410 Seminar (1).
 420 Advanced Heat and Momentum Transfer (3).
 422 Analysis of Equilibrium Stage Processes (3).
 423 Advanced Mass Transfer (3).
 430 Mechanics of Viscoelastic Fluids (3).
 451 Advanced Chemical Engineering Thermodynamics I (3).
 452 Advanced Chemical Engineering Thermodynamics II (3).
 455 Irreversible Thermodynamics (3).
 461 Process Development and Plant Design (3).
 463 Chemical Reaction Engineering Science (3).
 470 Mathematical Studies of Chemical Engineering Operation (3).
 471 Process Optimization Methods in Chemical Engineering (3).
 472 Advanced Computing for Chemical Engineers (3).
 490 Research (cr. arr.)

CHEMISTRY

- 210 Organic Chemistry (3).
 211 Organic Chemistry Laboratory (2).
 212 Organic Chemistry (3).
 213 Organic Chemistry Laboratory (2).
 221 Quantitative Instrumental Analysis (4).
 223 Quantitative Chemical Analysis (4).
 230 Physical Chemistry for Life Science (3).
 231 Physical Chemistry (3).
 233 Physical Chemistry (3).
 234 Physical Chemistry Laboratory (3).
 250 Senior Research (3).
 298 Senior Honors Research (3).
 299 Senior Honors Research (3).
 301 Topics in Chemistry (cr. arr.)
 310 Trace Analysis (3).
 312 Instrumental Methods of Analysis (4).
 314 Intermediate Organic Chemistry (3).
 315 Organic Reaction Mechanisms (3).
 316 Synthetic Organic Chemistry (3).
 318 Chemical Literature and Patents (1).
 319 Spectrometric Identification of Organic and Bioorganic Compounds (3).
 321 Intermediate Analytical Chemistry (2).
 325 Qualitative Organic Analysis (3).
 329 Environmental Chemistry (3).

- 330 Intermediate Physical Chemistry (2).
 331 Intermediate Physical Chemistry (2).
 332 Chemical Thermodynamics (3).
 335 Nuclear Chemistry (3).
 341 Inorganic Chemistry (3).
 343 Intermediate Inorganic Chemistry (2).
 351 Topics in Environmental-Toxicological Chemistry (3).
 361 Introduction to Radiochemistry (3).
 401 Topics (cr. arr.)
 409 Chemistry of Natural Products (3).
 410 Seminar (1).
 411 Organometallics (3).
 412 Physical Organic Chemistry I (3).
 417 Applications of the Reactions of Organic Chemistry (3).
 418 Advanced Inorganic Chemistry (3).
 419 Physical Organic Chemistry II (3).
 423 Separations and Chromatography (3).
 425 Advanced Analytical Chemistry I (3).
 427 Advanced Analytical Chemistry II (3).
 430 Advanced Physical Chemistry (3).
 431 Quantum Chemistry (3).
 432 Chemical Kinetics (3).
 433 Atomic and Molecular Structures (3).
 436 Photochemistry and Molecular Excitation (3).
 440 Inorganic Mechanisms (3).
 442 Inorganic Thermodynamics (3).
 444 Inorganic Structural Methods (3).
 450 Research (cr. arr.)
 461 Advanced Radiochemistry (3).
 490 Research (cr. arr.)

CHILD AND FAMILY DEVELOPMENT

- 225 Introduction to the Study of Families (3).
 260 Adolescence and Young Adulthood (3).
 263 The Child From Six Through Adolescence (3).
 264 Child Development Laboratory (2-5).
 265 Infant-Toddler Development and Programs (3).
 300 Problems in Child and Family Development (cr. arr.)
 318 Topics (cr. arr.)
 330 Child Nutrition (3).
 341 Multi-Cultural Study of Children and Families (3).
 350 Readings (cr. arr.)
 351 The Black Family: Past, Present & Future (3).
 352 Violence in the Family (3).
 354 Curriculum Development for Early Childhood Programs (3).
 355 Recent Trends (1-2).
 356 Child and Family Advocacy (3).
 358 Administration of Programs for Children & Families (3).
 360 Community Programs for Children and Families (3).
 361 Working With Parents (2-3).
 362 Fostering Intellectual Development in Early Childhood (3).
 363 Family Development (3).
 364 Advanced Child Development Laboratory (3-6).
 366 Working With Parents Practicum (2-3).
 367 Aging and the Near Environment (3).
 368 Family Interaction (3).
 369 The Development of Sex-Role Behavior (2).
 372 Child Health Seminar: Infants & Children in Health Care Settings (4).
 390 Field Training (cr. arr.)
 400 Problems (cr. arr.)
 401 Social and Emotional Development (3).
 405 Integration and Application of Human Development Principles (3).
 410 Seminar (1-4).
 412 Research Methods in Child and Family Development (3).
 415 Readings (cr. arr.)
 418 Topics (cr. arr.)
 419 Field Training (cr. arr.)
 425 Remarriage & Stepfamilies: Development, Dynamics and Intervention (3).
 450 Research (cr. arr.)
 462 Cognitive Development (3).
 463 Theories of Human Development (3).
 468 Family Theories & Measurement I: Inductive Approach (3).
 469 Family Theories & Measurement II: Deductive Approach (3).
 470 Stress and Crises in Families (3).
 490 Research (cr. arr.)

CHILD HEALTH

- 348 Human Genetics (3).

CIVIL ENGINEERING

- 212 Transportation Systems Engineering (3).
 221 Structural Analysis I (4).
 222 Reinforced Concrete Design (3).
 223 Structural Steel Design (3).
 232 Civil Engineering Materials (3).
 241 Fluid Mechanics Laboratory (1).
 251 Fluid Mechanics (3).
 266 Building Construction (3).
 276 Aerospace Structures I (3).
 291 The Technology Environment Interface (3).

300 Problems (2-4).
 301 Topics in Civil Engineering (3).
 304 Digital Computer Applications in Engineering (3).
 309 Robotic Control and Intelligence (3).
 313 Advanced Surveying (3).
 314 Property Boundary Location (3).
 323 Structural Design II (3).
 324 Structural Design and Analysis (3).
 325 Energy Methods in Mechanics (3).
 326 Structural System Design (3).
 331 Prestressed Concrete (3).
 340 Applied Fluid Mechanics (2).
 341 Hydrology (3).
 342 Hydraulics of Open Channels (3).
 343 Analytical Hydrology (3).
 344 Analysis of Water-Resource Systems (3).
 345 Pipeline Engineering (3).
 346 Intermediate Fluid Mechanics (3).
 348 Solid and Hazardous Waste Management (3).
 349 Environmental Sanitation Practice (3).
 352 Advanced Mechanics of Materials (3).
 353 Experimental Stress Analysis (3).
 355 Soil Mechanics (3).
 363 Urban Development and Planning (3).
 365 Engineering Administration (3).
 367 Construction Contracts and Specifications (3).
 368 Construction Planning and Scheduling (3).
 369 Construction Methods and Equipment (3).
 370 Analysis of Civil Engineering Decisions (3).
 372 Foundation Engineering (3).
 373 Optimization of Civil Engineering Systems (3).
 374 Civil Engineering Systems Design (3).
 375 Matrix Methods of Structural Analysis (3).
 381 Traffic Engineering (3).
 384 Pavement Materials and Design (3).
 385 Vibration Analysis (3).
 391 Introduction to Water Quality (3).
 392 Water and Wastewater Treatment Processes (3).
 393 Sanitary Engineering Microbiology (3).
 394 Sanitary Engineering Chemistry (3).
 395 Water Quality Analysis (3).
 396 Planning and Geometric Design of Highways (3).
 400 Problems (1-6).
 401 Advanced Topics in Civil Engineering I (1-3).
 402 Directed Reading in Civil Engineering (1-3).
 407 Numerical Methods in Engineering (3).
 410 Seminar (1).
 411 Continuum Mechanics (3).
 412 Theory of Elasticity (3).
 413 Theory of Plates and Shells (3).
 414 Theory of Elastic Stability (3).
 416 Theory of Plasticity (3).
 418 Advanced Dynamics (3).
 419 Nonlinear Mechanical Analysis (3).
 420 Materials and Measurement (3).
 421 Advanced Topics Structural Analysis (3).
 422 Advanced Structural Analysis (3).
 423 Structural Analysis (3).
 424 Design of Special Structures Systems (3).
 426 Space Mechanics (3).
 428 Vibrations of Distributed Parameter Systems (3).
 430 Reinforced Concrete Theory and Design (3).
 432 Concrete Shell Design and Construction (3).
 436 Advanced Soil Mechanics (3).
 437 Design of Earth and Earth-Rock Dams (3).
 438 Highway Transportation (3).
 441 Advanced Hydraulic Engineering (3).
 445 Water Quality Modeling (3).
 450 Construction Engineering (3).
 451 Construction Productivity (3).
 452 Construction Project Management (3).
 453 Construction Administration (3).
 457 Land Use Planning (3).
 458 Dynamical Theory (3).
 459 Dynamics of Structures (3).
 460 Fundamentals of Fluid Mechanics (3).
 461 Potential-Flow Theory (3).
 462 Viscous-Flow Theory (3).
 464 Hydrodynamics (3).
 465 Wind Engineering (3).
 472 Behavior of Reinforced Concrete Members (3).
 475 Random Vibration (3).
 483 Transportation Planning and Models (3).
 484 Theory of Traffic Flow (3).
 485 Traffic Control Engineering (3).
 486 Finite Element Methods (3).
 490 Research (cr. arr.)
 491 Unit Process Laboratory (3).
 492 Physiochemical Treatment Processes (3).
 493 Biochemical Treatment Processes (3).
 496 Design of Water and Wastewater Treatment Facilities (3).
 498 Engineering Aspects of Water Quality (3).

CLASSICAL STUDIES

CLASSICAL CIVILIZATION

201 Topics in Classical Studies (cr. arr.)
 224 Roman Classics in Translation (3).
 225 Greek Classics in Translation (3).
 226 Greek Drama (3).
 227 Advanced Mythology (3).
 260 Greek and Roman Religion (3).

301 Topics in Classical Studies (cr. arr.)
 352 The Classical Tradition (3).
CLASSICS
 201 Topics (cr. arr.)
 293 Honors Proseminar (3-6).
 311 History of the Greek and Latin Languages (3).
 323 Greek and Roman Numismatics I (3).
 324 Greek and Roman Numismatics II (3).
 330 Introduction to Text Criticism and Paleography (3).
 350 Special Readings (1-3).
 380 Advanced Study in the Teaching of the Classics (3).
 409 Introduction to Graduate Study in Classics (1).
 415 Seminar in Classical Mythology (3).
 425 Seminar in the Hellenistic Age (3-6).
 435 Seminar in Ancient Rhetoric and Oratory (3).
 437 Seminar in Ancient Literary Criticism (3).
 455 Seminar in Greco-Roman Religion (3).
 465 Seminar in Greco-Roman Satire and Social Criticism (3).
 475 Seminar in the Age of the Antonines (3-6).
 490 Research and Thesis (1-8).

CLINICAL LABORATORY SCIENCES

280HT Elementary Histology (3).
 281HT Basic Histotechnology (6).
 282HT Special Staining Techniques (3).
 283HT Applied Histotechnology (9).
 284HT Research and Instructional Techniques (3).
 285HT Clinical Management (3).
 286HT Basic Disease Processes (3).
 300CT Problems in Cytotechnology (1-3).
 300HT Problems in Histotechnology (1-3).
 300MT Problems in Medical Technology (1-3).
 301CT Cytology of the Female Genital Tract (8).
 301HT Advanced Histotechnology (6).
 301MT Fundamentals of Medical Technology I (3).
 302CT Cytology of the Respiratory Tract (4).
 302MT Fundamentals of Medical Technology II (3).
 303CT Cytology of the Urinary Tract (4).
 303MT Fundamentals of Medical Technology III (3).
 304CT Cytology of the Gastrointestinal Tract (5).
 304MT Clinical Practicum (3).
 305CT Cytology of Body Fluids (4).
 305MT Hemostasis (2).
 306CT Cytology of the Breast (2).
 306MT Clinical Immunology (3).
 307CT Fine Needle Aspiration Cytology (2).
 307MT Blood Banking (3).
 308CT Special Procedures in Cytology (2).
 308MT Clinical Hematology (6).
 309CT Clinical Management (1).
 309MT Clinical Microbiology (6).
 310CT Technical Application With Research In Cytotechnology (8).
 310MT Clinical Chemistry (6).
 311CT Cytologic Preparation (2).
 311MT Principles of Management and Education (1).
 312CT Practical Cytotechnology (6).
 312MT Research and Instructional Techniques (3).

CLOTHING AND TEXTILES

281 Fashion and Costume Design (3).
 282 Apparel Production Processes (3).
 283 Analysis of Apparel Production Components (2).
 285 The Clothing/Textiles Consumer (2).
 286 Applied Textiles (3).
 290 Pre-Internship Seminar (1).
 300 Problems (cr. arr.)
 318 Topics (cr. arr.)
 350 Readings (cr. arr.)
 355 Recent Trends (1-3).
 380 Tailoring (3).
 381 Costume History (3-4).
 382 Applied Costume Design (3).
 383 Advanced Fashion Illustration (3).
 384 Textile and Apparel Economics (3).
 385 Textile Fibers (3).
 387 Flat Pattern Design (3).
 388 Clothing Behavior and Society (3).
 389 Clothing for People with Special Needs (2).
 390 Field Training (cr. arr.)
 400 Problems (cr. arr.)
 410 Seminar (1-4).
 412 Research Methods in Clothing and Textiles (3).
 415 Readings (cr. arr.)
 418 Topics (cr. arr.)
 450 Research (cr. arr.)
 480 Textile Fabrics (3).
 481 Advanced Costume History (3).
 488 Cultural Interpretations of Dress and Adornment (3).
 490 Research (cr. arr.)

COMMUNICATIVE DISORDERS

202 Normal Language Development (3).
 210 Speech Science (3).
 215 Introduction to Clinical Practice (1-3).
 220 Communicative Disorders - Management and Diagnostic Techniques (3).
 222 Communicative Disorders in the Classroom (3).
 230 Hearing Science (3).
 301 Topics (cr. arr.)

320 Articulation Disorders (3).
 322 Alternative/Augmentative Communication (2).
 325 Clinical Practice in Speech Pathology (1-3).
 330 Introduction to Audiology (3).
 334 Auditory Rehabilitation (3).
 341 Introduction to Graduate Studies on Communication Disorders (3).
 400 Problems (cr. arr.)
 401 Topics (cr. arr.)
 402 Developmental Linguistic Disorders (3).
 403 Acquired Linguistic Disorders (3).
 410 Acoustic Phonetics (3).
 411 Laboratory Phonetics (3).
 412 Laboratory Instrumentation in Communication Disorders (3).
 420 Motor Speech Disorders (3).
 421 Fluency Disorders (3).
 422 Voice and Cleft Palate (3).
 425 Clinical Practice in Speech Pathology (1-3).
 426 Diagnostics in Speech Pathology (3).
 431 Pathology of Hearing (3).
 432 Advanced Audiology I (3).
 433 Advanced Audiology II (3).
 435 Clinical Practice in Audiology (1-3).
 450 Research (cr. arr.)
 460 Seminar: Contemporary Topics in Speech and Language Pathology (1-3).
 461 Seminar: Contemporary Topics in Audiology (1-3).
 490 Research (cr. arr.)

COMMUNITY DEVELOPMENT

300 Community Development Perspectives (3).
 301 Topics in Community Development (1-3).
 310 Community Development Theory (3).
 315 Strategies for International Community Development (3).
 320 Group and Interpersonal Competence (3).
 330 Professional Practice of Community Development (3).
 350 Special Readings (1-3).
 360 Principles and Practices of Planning (3).
 362 The Implementation of the Local Planning Process (3).
 364 Area and Regional Planning (3).
 370 Seminar in International Development (3).
 372 Community Development in Lesser Developed Countries (3).
 376 Cultural Factors in Community Development (3).
 382 Principles & Practices of Fund Raising/Evaluation-Human Serv Org (3).
 383 The Management of Volunteer Systems (3).
 384 Elderly Consumer-Participants in Human Service Delivery (3).
 390 Program Development and Administration for Human Services (3).
 400 Problems (cr. arr.)
 410 Community Development Process (3).
 412 The Theory of Planning (3).
 417 Government Social Policy and Institutional Resources (3).
 420 Field Experience (3-12).
 425 Community Development Research Methods and Techniques (3).
 430 Community Development Seminar (3).
 438 Community Development in Urban Areas (3).
 440 Specialized Topics in Community Development (1-3).
 442 Community Development Practice in Urban Areas (3).
 450 Research (1-6).
 490 Research (3).

COMPUTER SCIENCE

201 Programming as a Research Tool (3).
 203 Programming II: PL/I (3).
 207 Programming Languages; SNOBOL (1).
 208 Job Control Language & System Utilities (3).
 210 Introduction to System Concepts (3).
 212 Assembly Language Program (3).
 215 Systems Analysis I (3).
 300 Problems (cr. arr.)
 301 Topics (cr. arr.)
 304 Minicomputers: Programming and Applications (3).
 310 Computer Graphics I (3).
 315 Systems Analysis II (3).
 320 Data Structures (3).
 323 Numerical Analysis (3).
 324 Numerical Linear Algebra (3).
 330 Computer Organization I: Design Fundamentals (3).
 337 Applied Modern Algebra (3).
 341 Theory of Automata I (3).
 343 Compilers I (3).
 350 Special Readings (1-3).
 351 Systems Programming I (3).
 352 Operating Systems Theory I (3).
 353 UNIX Operating System with C (3).
 370 Software Development Methodology I (3).
 400 Problems (1-3).
 401 Topics (cr. arr.)
 420 Algorithm Analysis and Design (3).
 425 Artificial Intelligence (3).
 430 Computer Organization II: Architecture (3).
 441 Theory of Automata II (3).
 443 Compilers II (3).
 450 Research (cr. arr.)
 451 Systems Programming II (3).

- 452 Operating Systems Theory II (3).
- 460 Data Storage and Retrieval (3).
- 465 Data Base Management Systems (3).
- 470 Software Development Methodology II (3).
- 480 Computer Networks (3).
- 490 Research (cr. arr.)

CURRICULUM AND INSTRUCTION

- T160 Aiding: Nursery/Day Care Programs (2-4).
- T161 Aiding: Kindergarten (2).
- T162 Aiding: Primary Grades (2).
- T163 Aiding: Intermediate Grades (2).
- T164 Aiding: Secondary Schools (1-2).
- T211 Teaching of Grammar and Usage in the Secondary School (3).
- T213 Teaching of Speech in the Secondary School (3).
- T221 Science in the Elementary School (2).
- T224 Teaching of Science in the Secondary School (3).
- T230 Art Activities in the Elementary School (2).
- T233 The Structure of the Secondary Art Curriculum (3).
- T234 Secondary Art Education Methods, Media & Materials (3).
- T240 Teaching Skills (3).
- T250 Special Readings (1-3).
- T251 Teaching of Social Studies in the Secondary School (3).
- T255 Elementary School Music (2).
- T256 Music Literature for Children (3).
- T257 Teaching Music in the Elementary School (3).
- T258 Teaching of Secondary School Music (3).
- T259 Teaching of Instrumental Music (3).
- T267 Teaching Mathematics in the Elementary School (3).
- T268 Teaching of Mathematics in the Secondary School (3).
- T280 Teaching of Romance Languages in the Secondary School (3).
- T283 Teaching of German in Elementary School (3).
- T299 Student Teaching (cr. arr.)
- T301 Child Study (3).
- T303 Emergent Language in Early Childhood (3).
- T304 Family and Community Resources for Early Childhood Education (3).
- T305 Early Childhood Curriculum and Methods (3).
- T306 Strategies of Diagnosis & Intervention in Early Childhood (3).
- T309 Literature in the Elementary School (3).
- T310 Seminar in Curriculum & Instruction (1-3).
- T311 English Language Study in the Schools (3).
- T312 Teaching the Language Arts in Elementary School (2).
- T313 Literature for Adolescents (1-3).
- T314 Teaching of Composition (3).
- T315 Teaching of Reading (3).
- T316 Teaching Reading in the Content Areas (3).
- T317 Diagnostic and Corrective Reading in the Classroom (3).
- T318 Analysis and Correction of Reading Disabilities (3).
- T319 Practical Experiences in Reading (2).
- T321 Advanced Teaching of Elementary Science (3).
- T322 Food Experiences for Children (3).
- T324 Advanced Teaching of Secondary Science (3).
- T332 Organization of Public School Art (2).
- T350 Social Studies in the Elementary School (3).
- T351 Teaching Legal Rights and Responsibilities of Citizenship (2).
- T355 Administration and Supervision of Music Programs (2).
- T356 Advanced Techniques in Music Teaching (2-5).
- T360 Topics in Curriculum and Instruction (cr. arr.)
- T367 Teaching Techniques and Curriculum in Elementary School Math (3).
- T368 Teaching of Algebra in the Secondary School (3).
- T369 Teaching of Geometry in the Secondary School (3).
- T371 Production of Instructional Media Materials (3).
- T372 Selection, Utilization and Evaluation of Media Resources (3).
- T373 Photography for Teachers (3).
- T375 Programmed Instruction (3).
- T376 Instructional Television (3).
- T377 Production of Educational Motion Pictures (3).
- T378 School Learning Resource Centers (3).
- T380 Studies in the Techniques of Teaching German (3).
- T383 Internship in German (3).
- T400 Problems (cr. arr.)
- T401 Perspectives in Parent Education/Parent Involvement (3).
- T402 Early Childhood Research-Based Curriculum Models (3).
- T403 Advanced Early Childhood Curriculum (3).
- T409 Literature for Children and Youth (3).
- T410 Seminar in Curriculum and Instruction (1-3).
- T411 Studies in English Education (3).
- T412 Elementary Language Arts Curriculum (3).
- T414 Instructional Materials in Reading and Language Arts (3).
- T415 Practicum in Child Study I (3-5).
- T416 Practicum in Child Study II (3-5).
- T417 Practicum in Child Study Supervision (3-5).
- T418 Reading Miscue Analysis (3).
- T420 Issues and Trends in Reading Instruction (3).
- T421 Survey of Science Education (3).
- T422 Curricula in Science Education (3).

- T423 Review of Research in Science Education (3).
- T424 Trends and Issues in Science Education (3).
- T430 Survey of Art Education (3).
- T431 Curriculum in Art Education (3).
- T432 Review of Research in Art Education (3).
- T438 Extracurricular Activities (3).
- T440 The Elementary School Curriculum (3).
- T442 Psychology of Affective Growth (3).
- T443 Tests and Measurements for Elementary and Secondary Schools (3).
- T444 The Supervision of Student Teaching (3).
- T445 The Secondary School Curriculum (3).
- T446 Curriculum Construction for Secondary Schools (3).
- T447 Improvement of Secondary School Teaching (3).
- T448 Analysis of Instructional Behavior (3).
- T449 Classroom Discipline and Interpersonal Relations (3).
- T450 Patterns for Instruction in Secondary Social Studies (3).
- T451 Teaching Contemporary Legal Issues of Citizenship (3).
- T452 Secondary Social Studies Curriculum (3).
- T453 Elementary Social Studies Curriculum (3).
- T456 Foundations of Music Education (3).
- T457 Curriculum Materials in Music Education (2-5).
- T458 Techniques in Instrumental Music Teaching (3).
- T459 Teaching Vocal Music (3).
- T460 Advanced Topics (cr. arr.)
- T461 Advanced Piano Pedagogy I (3).
- T462 Advanced Piano Pedagogy II (3).
- T465 Diagnosis and Remediation of Learning Difficulties in Mathematics (3).
- T467 Using Manipulative Materials in Teaching Mathematics III (3).
- T468 Secondary Mathematics Curriculum & Teaching (3).
- T470 In-Service Course in Curriculum and Instruction (cr. arr.)
- T471 Instructional Systems Design and Mediation (3).
- T472 Review of Research and Theory in Media (3).
- T480 Internship in Curriculum and Instruction (cr. arr.)
- T490 Research in Curriculum and Instruction (cr. arr.)

DAIRY SCIENCE

- 200 Problems (cr. arr.)
- 300 Problems (cr. arr.)
- 390 Field Training in Dairy Husbandry (cr. arr.)
- 400 Problems (cr. arr.)
- 401 Topics in Dairy Science (cr. arr.)
- 408 Dairy Chemistry (3).
- 410 Seminar (1).
- 420 Endocrinology (3).
- 425 Anatomy of the Mammary Gland (2).
- 427 Recent Advances in Environmental and Endocrine Physiology (1).
- 430 Physiology of Milk Secretion (3).
- 435 Physiology of Cell Preservation (3).
- 437 Environmental Physiology (3).
- 440 Bioenergetics (3).
- 445 Advanced Dairy Production (2).
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)

ECONOMICS

- 201 Topics in Economics (1-5).
- 210 Labor Economics (3).
- 215 Economics of Public Policy: Government Finance (3).
- 229 Money and Banking (3).
- 231 Economic Analysis for Journalists (3).
- 241 Evolution of Industrial Society (2).
- 251 Theory of the Firm (3).
- 253 Macroeconomic Policy (3).
- 256 Economics of Public Policy: Antitrust Economics (3).
- 260 Economic Development (3).
- 261 Introduction to the Soviet Economy (3).
- 265 The Economics of Location (3).
- 298 Honors Proseminar (2-3).
- 299 Honors Proseminar (2-3).
- 300 Problems (cr. arr.)
- 301 Topics in Economics (1-5).
- 308 Development of the American Labor Movement (3).
- 311 Labor Market, Employment and Wages (3).
- 312 Introduction to the Economics of Human Resources (3).
- 315 Public Finance (3).
- 316 State and Local Finance (3).
- 317 Social Insurance (3).
- 318 Labor Law and Legislation (3).
- 319 Public Sector Labor Relations (3).
- 320 Introduction to Economic Doctrines (3).
- 321 Labor Arbitration & Labor/Management Dispute Resolution Technique (3).
- 325 International Economics (3).
- 329 The Banking System and the Money Market (3).
- 332 Economics for Managers (3).
- 335 Economics for Decision Making (3).
- 348 Economic Foundations of the Community (3).
- 351 Intermediate Price Theory (3).
- 353 Intermediate Income Analysis (3).
- 355 The Structure of Industry (3).
- 358 Regional Economic Analysis (3).
- 361 Comparative Economic Systems (3).
- 362 Welfare Economics (3).
- 368 Business Fluctuations (3).

- 370 Introduction to Quantitative Economics (3).
- 371 Applied Econometrics (3).
- 372 Mathematical Economics (3).
- 384 Economic and Demographic Change (3).
- 388 Comparative Labor Movements (3).
- 389 Theory of the Labor Movement (3).
- 399 Independent Study (cr. arr.)
- 400 Problems (cr. arr.)
- 401 Topics in Economics (3).
- 402 Problems in Economic Education (1).
- 405 Advanced Microeconomic Analysis (3).
- 411 Topics in Wage and Employment Theory (3).
- 413 M. A. Research Seminar (3).
- 415 Advanced Public Finance I (3).
- 416 Advanced Public Finance II (3).
- 420 History of Economic Thought (3).
- 425 International Finance (3).
- 426 International Trade (3).
- 430 Advanced Money and Banking (3).
- 431 Central Banking Policies (3).
- 451 Advanced Price Theory (3).
- 452 Seminar in Microeconomics (3).
- 453 Advanced Income Analysis (3).
- 454 Seminar in Macroeconomics (3).
- 455 Monopoly and Competition (3).
- 456 Seminar in Public Utility Regulation (3).
- 460 Theory of Economic Development (3).
- 470 Mathematical Economics I (3).
- 471 Mathematical Economics II (3).
- 472 Introduction to Econometrics (3).
- 475 Econometrics I (3).
- 476 Econometrics II (3).
- 478 Input-Output Analysis (3).
- 479 Advanced Seminar in Quantitative Economics (3).
- 480 Independent Readings for Ph.D. Comprehensive Examinations (1-6).
- 484 Economics of Technological Change (3).
- 490 Research (cr. arr.)

EDUCATION STUDIES

- B161 Observation of English Schools (3-5).
- B162 Observation of European Schools (2-4).
- B163 Semester Abroad Seminar (2-4).
- B350 Historical Foundations of Modern Education (2-3).
- B351 Historical Foundations of American Education (2.5-3).
- B352 Comparative Foundations of Education (2.5-3).
- B353 Intellectual Foundations of Education (2.5-3).
- B360 Topics in Educational Studies (cr. arr.)
- B400 Problems (cr. arr.)
- B410 Seminar in Education Studies (1-3).
- B471 Philosophic Theory in Education (3).
- B472 Readings in History of Education (3).
- B473 The Development of Higher Education in the United States (3).
- B481 Classic and Contemporary Educational Thought (3).
- B490 Research in the History and Philosophy of Education (cr. arr.)

EDUCATIONAL ADMINISTRATION

- C242 School Organization and Administration for Teachers (2).
- C360 Topics in Educational Administration I (cr. arr.)
- C390 Foundations of Educational Administration (2-3).
- C400 Problems (cr. arr.)
- C404 Elementary and Secondary School Supervision (3).
- C406 Secondary School Administration (3).
- C408 Elementary School Administration (3).
- C410 Seminar in Educational Administration (1-3).
- C411 Education Policy Analysis (3).
- C412 The Superintendency (2-3).
- C416 Seminar in Elementary School Administration and Organization (1-3).
- C420 Secondary School Organization and Administration (3).
- C424 School Surveys and School Facilities Analysis (4).
- C426 Interpersonal Communication and Conflict Resolution (3).
- C430 Junior High & Middle Schools Administration (3).
- C434 Planned Change in Education (3).
- C438 Extracurricular Activities (3).
- C440 Issues in School Finance (2-3).
- C441 School Budget Development and Fiscal Management (3).
- C444 Current Issues in School Administration (3).
- C451 School Staff Personnel Administration (3).
- C452 School-Community Relations (3).
- C454 Legal Aspects of Education (3).
- C456 Investigation in School Law (3).
- C460 Topics in Educational Administration II (cr. arr.)
- C470 Field Experience in Educational Administration (0-9.9).
- C490 Research in Educational Administration (cr. arr.)

EDUCATIONAL AND COUNSELING PSYCHOLOGY

- A160 Exploratory Field Experience (1-3).
- A205 Learning and Instruction (2).
- A207 Child Development (2).
- A208 Adolescent Development (2).
- A280 Educational Measurement (2).

A300 Problems (1-3).
 A301 Foundations of Educational Psychology (3).
 A310 Seminar (1-3).
 A315 Human Learning (3).
 A320 Foundations of Counseling and School Psychology (3).
 A321 Parent Counseling and Consultation (3).
 A322 School Guidance Programs (3).
 A350 Readings (1-3).
 A351 Foundations of Group Procedures (3).
 A361 Foundations of Rehabilitation (3).
 A362 Work Adjustment Procedures for the Handicapped (3).
 A363 Vocational Placement for the Handicapped (2).
 A364 Rehabilitation Facilities (3).
 A365 Alcohol Abuse and Rehabilitation I (3).
 A366 Alcohol Abuse and Rehabilitation II (3).
 A370 Senior Field Experience (3-8).
 A371 Foundations of Career Development (3).
 A372 Career Resources in Business and Industry (2-4).
 A373 Theory and Practice in Career Development (3).
 A380 Foundations of Educational and Psychological Measurement (3).
 A381 Measurement of Cognitive Abilities (3).
 A382 Vocational Assessment of the Handicapped (3).
 A400 Problems (1-3).
 A406 Mental Health Principles and Programs (3).
 A407 Advanced Child Development (3).
 A408 Advanced Adolescent Development (3).
 A410 Seminar (1-3).
 A411 Adviser's Seminar (1).
 A412 Evaluation of Educational Programs (3).
 A417 Advanced Human Learning (3).
 A418 Applications of Human Learning Principles (3).
 A420 Counseling Methods and Practices (3).
 A421 Counseling With Children (3).
 A422 Behavioral Therapy With Children (3).
 A423 Family Counseling (3).
 A424 Marriage Counseling (3).
 A425 Counseling Psychology Practicum (3-6).
 A426 School Psychology Practicum (3-6).
 A427 Practicum in Marriage and Family Counseling (3-6).
 A428 Studies in Supervision (3).
 A430 Advanced Counseling Theories (3).
 A431 Biofeedback in Psychological Practice (3).
 A433 Psychological Consultation (3).
 A435 Ethical and Legal Issues in Psychological Practice (3).
 A440 Foundations of Student Development (3).
 A441 Design and Management of Student Development Programs (3).
 A442 Practicum in Student Development Programs (3).
 A445 Research (3-6).
 A451 Methods in Group Counseling (3).
 A452 Practicum and Theory in Group Counseling I (3).
 A453 Practicum and Theory in Group Counseling II (3).
 A461 Rehabilitation Counseling (2).
 A462 Medical Aspects of Disability (2).
 A463 Psychological Aspects of Disability (2).
 A470 Field Experience in Counseling (3-9).
 A471 Analysis of Research in Career Development (3).
 A472 Practicum in Career Development and Career Counseling (3-6).
 A480 Measurement of Interest and Personality (3).
 A481 Individual Intelligence Testing (3).
 A482 Psychological Assessment of Adults (3).
 A483 Psychological Assessment of Children (3).
 A484 Projective Assessment of Children (3).
 A485 Projective Assessment of Adults (3).
 A486 Practicum in Psychological Assessment (3-6).
 A490 Research (1-12).
 A491 Internship in Counseling Psychology (3-6).
 A492 Internship in School Psychology (3-6).

EDUCATIONAL RESEARCH AND STATISTICS

R101 Introduction to Microcomputers (1).
 R301 Inservice Course in Educational Applications of Microcomputers (1-3).
 R312 Programming in LOGO and its Instructional Applications (2).
 R314 Utility Software for Microcomputers (2).
 R316 Utilization of Instructional Software for Microcomputers (2).
 R320 Microcomputer Software Development in BASIC (3).
 R330 Development of Instructional Software for Microcomputers in PILOT (3).
 R340 Microcomputer Software Development in Pascal (3).
 R360 Topics in Educational Research and Statistics (1-3).
 R370 Educational Statistics I (3).
 R400 Problems in Educational Research and Statistics (cr. arr.)
 R409 Overview of Educational Research (2).
 R410 Seminar in Educational Research and Statistics (1-3).
 R435 Educational Statistics II (3).
 R438 Computer Applications in Educational Research (3).
 R441 Foundations of Educational Research (3).

ELECTRICAL AND COMPUTER ENGINEERING

205 Circuit Theory II (3).
 206 Feedback Theory (3).

216 Linear Systems and Circuits (3).
 220 Instrumentation for Life Scientists (4).
 225 Electromagnetic Fields (3).
 226 Logic Design (4).
 227 Assembly Language Programming (3).
 235 Physical Electronics (3).
 255 Experimental Electrical Engineering I (3).
 256 Experimental Electrical Engineering II (3).
 266 Power Engineering I (3).
 286 Electronic Circuits and Signals I (3).
 300 Problems (2-4).
 301 Topics in Electrical Engineering (3).
 302 Microcomputers for Non-Electrical Engineers (3).
 304 Digital Computer Applications in Engineering (3).
 305 Basic Analog Computer Applications in Engineering (3).
 306 Introduction to Minicomputers (4).
 307 Introduction to Digital Signal Processing (3).
 310 Introduction to Bioengineering (3).
 315 Engineering Evaluation of Energy Systems and Resources (3).
 317 Network Analysis (3).
 318 Network Synthesis and Filter Design (4).
 326 Microcomputer Architecture and Interfacing (4).
 327 Computer Architecture (3).
 328 Design of Digital Subsystems (3).
 330 Electronic Circuits and Signals II (4).
 333 Semiconductor Device Theory (3).
 334 Design and Analysis of Integrated Circuits (3).
 335 Solid State Area Laboratory (1).
 336 Solid State Power Circuits (4).
 338 Amplifier Analysis and Design (3).
 345 Electromechanical Conversion I (4).
 347 Electric Transportation and Industrial Drives (3).
 354 Microprogramming (3).
 357 Experimental Electrical Engineering III (3).
 358 Automatic Control System Design (4).
 359 Computer Process Control (3).
 360 Reliability of Electric Power Systems (3).
 361 Introduction to Power Systems (4).
 362 Power Systems Analysis (3).
 363 Symmetrical Components Analysis of Power Systems (3).
 364 Computer Applications to Power Systems (3).
 365 Introduction to Digital Image Processing (3).
 366 Introduction to Pattern Recognition (3).
 369 Principles of Direct Energy Conversion (3).
 372 Modulation and Transmission of Signals (3).
 375 Introduction to Plasmas (3).
 376 Distributed Transmission Systems (4).
 378 Microwave Principles (4).
 379 Fundamentals of Acoustical Engineering (4).
 382 Lasers and Their Applications (3).
 388 Logic and Wave-shaping Circuits (3).
 400 Problems (2-5).
 401 Advanced Topics in Electrical Engineering (3).
 402 Thyristor Power Control and Conversion (3).
 405 Advanced Analog, Iterative and Hybrid Computer Techniques (3).
 407 Advanced Digital Signal Processing (3).
 408 State Variable Methods in Automatic Control (3).
 410 Seminar (1).
 411 Advanced Electrical Machinery Theory (3).
 413 Introduction to Fourier Optics (3).
 420 Analysis of Biological Control Systems (3).
 424 Digital Electronics (3).
 427 Digital Software Systems Design (3).
 428 Digital Hardware Systems Design (3).
 430 Power-Systems Stability (3).
 431 Economics of Power Systems (3).
 433 Extra High Voltage Power Systems (3).
 434 Direct Current Power Systems (3).
 435 Power System Relaying (3).
 436 Lightning and Switching Surges in Power Systems (3).
 437 Solid State Energy Conversion (3).
 438 Computer Simulation (3).
 442 Advanced Integrated Circuits (3).
 443 Solid State Theory I (3).
 444 Solid State Theory II (3).
 446 Semiconductor Device Theory (3).
 447 Magnetogasdynamics (3).
 448 Quantum Electronics (3).
 450 Superconductivity and Its Applications (3).
 451 Superconductivity and Its Applications (3).
 455 Biomedical Instrumentation (3).
 456 Interactive Computer Graphics (3).
 457 Machine Intelligence (3).
 460 Advanced Electric Circuit Analysis (3).
 461 Network Synthesis (3).
 462 Linear Graphs and Electrical Networks (3).
 463 N-Port Networks Synthesis (3).
 466 Liapunov and Related Nonlinear Methods in Automatic Control (3).
 467 Optimal Control Theory (3).
 468 Stochastic Optimal Estimation and Control (3).
 469 Digital and Sample-Data Systems (3).
 470 Applications of Transforms (3).
 472 Communication Theory I (3).
 473 Communication Theory II (3).
 474 Artificial Intelligence (3).
 475 Information Theory (3).
 476 Theory of Automata (3).
 477 Coding Theory I (3).
 478 Coding Theory II (3).

479 Computer Vision (3).
 480 High Frequency Transmission and Radiation (3).
 481 Antennas (3).
 490 Research (cr. arr.)

ENGLISH

201 The Tradition of English Literature: Beginnings to 1784 (3).
 202 The Tradition of English Literature: Romanticism to the Present (3).
 206 Special Themes in Literature (3-6).
 208 Historical Survey of Women Writers (3).
 210 Advanced Rhetoric (3).
 218 Theories of Literature (3).
 223 Comparative Literature: Modern Continental Literature 1700-Present (3).
 260 Advanced Writing (3).
 290 Honors Seminar Essay (3).
 296 Honors Seminar: Critical Approaches to Literature (3).
 297 Honors Seminar: Historical Approach to Literature (3).
 301 Topics (cr. arr.)
 302 The Writing of Fiction (3).
 303 The Writing of Fiction (3).
 304 Afro-American Literature (3).
 306 Theory and Practice of College Composition (3).
 308 Major Women Writers (3).
 309 Topics in Linguistics (3-6).
 310 The English Bible (3).
 311 Beginning Playwriting (3).
 312 Advanced Playwriting (3).
 313 The Writing of Poetry (3).
 316 The Practice of Criticism (3).
 318 History of Criticism (3).
 319 The Structure of American English (3).
 320 History of the English Language (3).
 322 Regional and Social Dialects of American English (3).
 323 Principles of Teaching English as a Second Language (3).
 325 Chaucer (3).
 326 Medieval English Literature (3).
 331 Elizabethan Poetry and Prose (3).
 333 Elizabethan Drama (3).
 335 Shakespeare (3).
 336 Shakespeare (3).
 345 Milton (3).
 350 Special Readings (cr. arr.)
 351 Early Seventeenth-Century Poetry and Prose (3).
 352 The Metaphysical Poets (3).
 355 Literature of the Restoration and Early Eighteenth Century (3).
 356 The Later Eighteenth Century (3).
 357 The Eighteenth-Century English Novel (3).
 365 The Romantic Poets (3).
 367 The Age of Victoria: Prose, Poetry and Drama (3).
 368 The Nineteenth-Century English Novel (3).
 373 Colonial American Literature (3).
 375 American Romanticism (3).
 377 The Nineteenth-Century American Novel (3).
 378 The Rise of Realism (3).
 385 Special Themes in Folklore (3).
 389 Modern Literature (3).
 391 Chief Modern Novelists Prior to 1940 (3).
 392 Chief Modern Poets Prior to 1940 (3).
 393 Modern Short Story 1900 to Present (3).
 394 Chief Contemporary Novelists (3).
 395 Chief Contemporary Poets (3).
 396 Modern Drama (3).
 400 Problems (cr. arr.)
 401 Bibliography and Methods of Research (3).
 402 Advanced Writing of Fiction (3).
 403 Advanced Writing of Fiction (3).
 405 Internship in Publishing (3).
 407 Studies in Rhetorical Theory (3).
 411 Studies in English Education (3).
 413 Advanced Writing of Poetry (3).
 414 Advanced Writing of Poetry (3).
 416 Critical Approaches to Literature (3).
 417 Studies in the English Language (3).
 418 Introduction to Old English (3).
 420 Beowulf (3).
 424 Medieval Drama (3).
 425 Studies in Chaucer (3).
 426 Studies in Medieval English Literature (3).
 430 Spenser (3).
 431 Studies in Tudor Literature (1-4).
 433 Studies in Tudor and Stuart Drama (3).
 435 Studies in Shakespeare (3).
 436 Studies in Shakespeare (3).
 445 Milton (3).
 451 Studies in Early Seventeenth-Century Poetry and Prose (3-6).
 456 Studies in Literature of the Later Eighteenth Century (3).
 457 Studies in Restoration and Eighteenth-Century Fiction (3).
 464 The Earlier Romantics (3).
 465 The Later Romantics (3).
 466 Studies in Victorian Poetry (3).
 467 Studies in Victorian Literature (3).
 468 Studies in Nineteenth-Century Fiction (3).
 471 Studies in American Literature (3-12).
 478 American Literature 1865-1914 (3).

- 490 Research (cr. arr.)
- 491 Studies in Modern Literature (3).
- 492 Studies in Modern Criticism (3).
- 493 Studies in Contemporary Literature (3).
- 495 Studies in Modern Drama (3).
- 499 Seminars for Doctoral Candidates (3).

ENTOMOLOGY

- 201 Topics in Entomology (cr. arr.)
- 204 General Entomology (3).
- 210 Forest Entomology (3).
- 300 Problems (cr. arr.)
- 301 Topics in Entomology (cr. arr.)
- 302 Comparative Morphology of Insects (4).
- 304 Systematic Entomology (3).
- 306 Aquatic Entomology (3).
- 312 Bionomics of Insect Pests (3).
- 316 Principles of Insect Physiology (4).
- 321 Entomological Literature and History of Entomology (2).
- 350 Special Readings (cr. arr.)
- 361 Insects in Relation to Plant Diseases (3).
- 370 Advances in Insect Pest Management (3).
- 400 Problems (cr. arr.)
- 401 Topics in Entomology (cr. arr.)
- 405 Taxonomy of Immature Insects (3).
- 410 Seminar (cr. arr.)
- 415 Medical and Veterinary Entomology (3).
- 419 Insect Ecology (3).
- 420 Insect Toxicology (3).
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)

EXTENSION EDUCATION

- 210 Fundamentals of Communications (3).
- 220 Extension Education as Applied in Cooperative Extension Service (2-3).
- 300 Problems (1-4).
- 306 Extension Communication Principles & Their Application (3).
- 320 Agricultural Media (3).
- 400 Problems (cr. arr.)
- 403 Program Development and Evaluation (3).
- 405 Extension Organization and Administration (3).
- 406 Fundamentals of Extension Teaching of Adults (3).
- 408 Preparing Manuscripts for Scientific Journals (1).
- 410 Seminar (cr. arr.)
- 411 Topics in Extension Education (cr. arr.)
- 450 Research (cr. arr.)

FAMILY AND COMMUNITY MEDICINE

- 300 Problems (1-3).
- 310 The Health Care System (3).
- 315 Group Process in Community Health (2).
- 317 Planning for Change in Community Health (3).
- 330 Statistical Aspects of Public Health (3).
- 350 Special Readings (1-3).
- 400 Problems (1-3).
- 410 Principles of Community Health Education (3).
- 411 Methods in Community Health Education (3).
- 412 Planning for Change I (2).
- 415 Health Aspects of the Environment (3).
- 420 Principles of Epidemiology (3).
- 421 Advanced Epidemiology (3).
- 422 Research and Evaluation in Community Health Education (3).
- 440 Public Health Administration (3).
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)
- 491 Field Experience in Community Health (cr. arr.)
- 492 Field Experience in Community Health Education (cr. arr.)

FAMILY ECONOMICS AND MANAGEMENT

- 300 Problems (cr. arr.)
- 318 Topics (cr. arr.)
- 350 Readings (cr. arr.)
- 355 Recent Trends (1-2).
- 370 Housing the Family (3).
- 372 Family Values and Resource Management (2).
- 373 Financial Problems of the Individual and Family (3).
- 374 Use and Care of Home Equipment (3).
- 375 The Consumer and the Market (3).
- 376 Management of Financial Resources (3).
- 377 Economics and the Consumer (3).
- 378 Effective Consumer Decision-Making (3).
- 390 Field Training (cr. arr.)
- 400 Problems (cr. arr.)
- 410 Seminar (1-4).
- 412 Research Methods in Family Economics (3).
- 415 Readings (cr. arr.)
- 418 Topics (cr. arr.)
- 419 Field Training (cr. arr.)
- 450 Research (cr. arr.)
- 473 Family in the Economy (3).
- 475 Human Resource Development and Allocation (3).
- 476 Social Policy and the Family Economy (3).
- 490 Research (cr. arr.)

FINANCE

- 203 Corporation Finance (3).
- 218 Personal Risk Management and Insurance (3).
- 235 Time Series Analysis and Index Numbers (3).
- 300 Problems (cr. arr.)
- 305 Topics in Finance (3).
- 313 Insurance Theory, Employee Benefits and Pension Plan (3).
- 316 Credits and Collections (3).
- 317 Social Insurance (3).
- 318 Risk Management for the Firm (3).
- 323 Financial Management (3).
- 326 Financial Management Policy (3).
- 333 Investments (3).
- 338 Business and Economic Reporting (3).
- 340 Principles of Real Estate (3).
- 341 Real Estate Appraisal (3).
- 342 Real Estate Finance and Investment (3).
- 343 Financial Intermediaries and Markets (3).
- 353 Security Analysis (3).
- 355 Portfolio Management (3).
- 363 Management of Financial Institutions (3).
- 380 Statistical Forecasting (3).
- 400 Problems (1-3).
- 403 Seminar in Business Finance (3).
- 405 Topics in Finance (3).
- 418 Business and Economic Research (3).
- 423 Advanced Financial Management (3).
- 424 Working Capital Management (3).
- 425 Capital Budgeting (3).
- 433 Security Markets and Investments (3).
- 435 Seminar in Investment Analysis (3).
- 443 Financing Multinational Business (3).
- 453 Investment Policy and Portfolio Management (3).
- 461 Financial Markets and Institutions (3).
- 463 Commercial Bank Administration (3).
- 473 Case Research and Development (3).
- 490 Research (cr. arr.)

FOOD SCIENCE AND NUTRITION

- 200 Problems (cr. arr.)
- 204 Advanced Meats (3).
- 214 Meat Classification, Grading, Judging (2).
- 224 Meat Selection and Identification (3).
- 228 Principles of Food Systems Management (3-4).
- 240 Operational Management in Food Service (3).
- 250 Physical Principles for Food Processing (3).
- 255 Management and Training of Food Service Personnel (3).
- 275 Food, Lodging and Travel Services Marketing (3).
- 300 Problems (cr. arr.)
- 301 Topics in Food Science and Nutrition (cr. arr.)
- 305 Food Analysis (3).
- 309 Food Chemistry I (5).
- 327 Operations Analysis in Food Systems (2-4).
- 330 Food Processing: Plant Foods (3).
- 334 Food Processing: Muscle Foods (4).
- 335 Food Processing: Milk and Dairy Products (4).
- 337 Food Processing: Eggs and Egg Products (2).
- 340 Case Studies and Research in Food Service Management (3).
- 345 Advanced Food Production Technology for Food Services (3).
- 360 Food Quality and Sanitation (3).
- 372 Food Microbiology (3).
- 373 Food Microbiology Laboratory (2).
- 374 The Bacterial Spore (2).
- 375 Sensory Analysis of Food (3).
- 376 Microwave Heating of Food (2).
- 390 Internship in Food Science and Nutrition (1-6).
- 400 Problems (cr. arr.)
- 401 Topics in Food Science and Nutrition (cr. arr.)
- 402 Research Methods in Food Science (2).
- 404 Meat Investigations (3).
- 405 Advanced Microbiology of Foods (4).
- 409 Food Chemistry II (4).
- 410 Seminar (1).
- 417 Food and Industrial Fermentation (3).
- 450 Research (cr. arr.)
- 470 Advanced Studies in the Science & Technology of Food Preservation (4).
- 490 Research (cr. arr.)

FORESTRY, FISHERIES AND WILDLIFE

- 201 Topics in Forestry, Fisheries & Wildlife (cr. arr.)
- 204 Wood Technology (3).
- 205 Forest Pathology (3).
- 206 Wood Engineering (3).
- 207 Forest Fire Control and Use (2).
- 210 Forest Entomology (3).
- 211 Resource Measurements (3).
- 245 Wood Science (5).
- 253 Light Construction (3).
- 254 Wood Processing (3).
- 255 Wood Seasoning and Preservation (3).
- 290 Urban Forestry (2).
- 295 Forest Products Utilization (3).
- 298 Senior Honors Research (1-3).
- 300 Problems (cr. arr.)
- 301 Topics in Forestry, Fisheries, & Wildlife (cr. arr.)

- 302 Silvics (3).
- 303 Practice of Silviculture (3).
- 305 Introduction to Plant Pathology (3).
- 306 Forest Photogrammetry (2).
- 307 Mammalogy (4).
- 309 Watershed Management (3).
- 310 Forest Inventory (2).
- 311 Ichthyology (4).
- 312 Fish Husbandry (3).
- 314 Timber Management (3).
- 315 Natural Resources Management and Water Quality (3).
- 316 Waterfowl Biology (4).
- 317 Forest Valuation (3).
- 318 Forest Economics (3).
- 319 Advanced Forest Management (3).
- 320 Recreation Land Management (3).
- 322 Range and Wildlife Habitat Management (3).
- 323 Wildlife Management Techniques (3).
- 324 Limnology (3-4).
- 327 Principles of Wildlife Management (3).
- 328 Fisheries Management (3).
- 333 Animal Population Dynamics and Management (3).
- 340 Advanced Recreation Land Management (3).
- 350 Special Readings (cr. arr.)
- 353 Public Resource Policy (2).
- 360 Management-Utilization Trip (1).
- 361 Recreational Forestry Trip (1).
- 370 Logging Systems: Operations and Analyses (3).
- 391 Land Use Planning (2).
- 401 Topics in Forestry, Fisheries and Wildlife (cr. arr.)
- 403 Physiological Responses to Environment (3).
- 405 Forest Soils (3).
- 407 Applied Silviculture (3).
- 408 Forest Hydrology (3).
- 409 Remote Sensing (3).
- 410 Seminar (1).
- 412 Decision Making and Analysis in Natural Resources Management (3).
- 415 Advanced Ichthyology (3).
- 416 Research Methods (3).
- 417 Advanced Forest Mensuration (3).
- 418 Advanced Fishery Management (3).
- 419 Wildlife Ecology (3).
- 420 Advanced Forest Photogrammetry (3).
- 421 Plant Water Relations (3).
- 422 Woody Plant Physiology (3).
- 423 Plant-Water Relations Laboratory (2).
- 425 Tree Growth-Quality Relationships (3).
- 426 Quantitative Fishery Science (3).
- 427 Advanced Limnology (3).
- 428 Nutrient Cycling in Forested Watersheds (3).
- 429 Wetland Ecology (3).
- 430 Mammalian Ecology (2).
- 431 Freshwater Invertebrate Ecology (3).
- 432 Stream Ecology (3).
- 440 Vertebrate Behavior Ecology (3).
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)

FRENCH

- 201 Topics (cr. arr.)
- 203 Introduction to French Literature I (3).
- 204 Introduction to French Literature II (3).
- 206 Advanced French Composition and Conversation (3).
- 207 Intensive Beginning French (3).
- 208 Commercial French (3).
- 211 Intensive Beginning French I (5).
- 212 Intensive Beginning French II (5).
- 225 Twentieth Century French Women Writers in Translation (3).
- 226 Advanced Composition and Conversation III (3).
- 296 Honors Reading in French (1).
- 297 Honors Thesis in French (3).
- 301 Topics (cr. arr.)
- 304 Phonetics (3).
- 311 History of the French Language (3).
- 312 French Medieval Literature (3).
- 316 French Renaissance (3).
- 317 Seventeenth-Century French Literature (3).
- 318 Eighteenth-Century French Literature (3).
- 319 Nineteenth-Century French Literature (3).
- 320 Twentieth-Century French Novel (3).
- 321 Introduction to the Contemporary French Theatre (3).
- 323 Introduction to Contemporary French Poetry (3).
- 329 Nineteenth-Century French Novel (3).
- 350 Special Readings (1-3).
- 353 Readings in French (2-3).
- 356 Stylistics (3).
- 378 Structure of Modern French (3).
- 400 Problems (cr. arr.)
- 401 Bibliography and Methods (3).
- 410 Seminar (2-3).
- 411 Old French (3).
- 412 Studies in French Medieval Literature (3).
- 416 Studies in the French Renaissance (3).
- 417 Studies in Seventeenth-Century French Literature (3).
- 418 Studies in Eighteenth-Century French Literature (3).
- 419 Studies in Nineteenth-Century French Literature (3).
- 420 Studies in Twentieth-Century French Literature (3).
- 480 Readings (3-6).
- 490 Research (cr. arr.)

GEOGRAPHY

- 200 Special Problems (cr. arr.)
- 205 Settlement and Architectural Geography (3).
- 296 Honors (3).
- 297 Honors (3).
- 300 Special Problems (1-3).
- 301 Topics in Geography (cr. arr.)
- 303 Meteorology of the Biosphere (3).
- 305 Advanced Cultural Geography (3).
- 311 Advanced Physical Geography (3).
- 317 Historical Geography of North America (2).
- 337 Cartography (3).
- 338 Statistical Mapping (1).
- 339 Map Design (1).
- 340 Mexico and the Caribbean (3).
- 341 South America (3).
- 345 Remote Sensing (3).
- 346 Geography and Planning (1-3).
- 350 Special Readings (1-3).
- 366 Climates of the World (3).
- 371 Southeast Asia (3).
- 372 Geography of South Asia (3).
- 396 The Soviet Union (2).
- 399 Internship in Applied Geography and Cartography (1-3).
- 400 Special Investigations (1-3).
- 401 Topics in Geography (cr. arr.)
- 402 Field Geography (3).
- 403 Bibliographical Techniques (1).
- 404 Quantitative Procedures (3).
- 405 Research Methods (3).
- 406 Seminar in World Regional Geography I (1).
- 407 Seminar in World Regional Geography II (1).
- 408 American Approaches to Geography (1).
- 410 Seminar (1-3).
- 416 Seminar in the Geography of Anglo-America (1-3).
- 425 Advanced Economic Geography (3).
- 437 Computer-Assisted Cartography (3).
- 438 Geographic Information Systems and Resource Planning (3).
- 439 Digital Image Processing for Resource Management (3).
- 450 Research (1-6).
- 480 Political Geography (3).
- 490 Research (1-8).
- 495 Urban Geography (3).

GEOLOGY

- 220 Geology of Missouri (3).
- 224 Historical Geology (3-4).
- 234 Mineralogy (4).
- 290 Honors Proseminar in Geology (3).
- 300 Problems (1-5).
- 301 Topics (cr. arr.)
- 303 Exploration Geophysics (3).
- 304 Plate Tectonics (3).
- 305 Introduction to Geochemical Processes (3).
- 307 Structural Geology (4).
- 308 Sedimentology (4).
- 323 Optical Mineralogy (3).
- 324 Introduction to Petrology (4).
- 325 Hydrogeology (3).
- 331 Introduction to Paleontology (5).
- 336 Field Course (8).
- 342 Introduction to Low-Temperature Geochemistry (4).
- 351 Organic Geochemistry (3).
- 380 Marine Geology (3).
- 388 Petroleum Geology (3).
- 390 X-ray Mineralogy (3).
- 395 Introduction to Seismology (4).
- 396 Earthquake Seismology (3).
- 397 Exploration Seismology (3).
- 400 Problems (1-8).
- 401 Topics (cr. arr.)
- 402 Geotectonics (3).
- 404 Advanced Structural Geology (3).
- 407 Precambrian Geology (3).
- 410 Seminar (1-2).
- 411 Tectonics and Sedimentation (3).
- 412 Advanced Seismology (1-4).
- 413 Seminar in Solid-Earth Geophysics (2).
- 416 Seminar in Economic Geology (1-3).
- 418 Sediment Transportation Mechanics (3).
- 419 Carbonate Petrology (3).
- 420 Sandstone Petrology (3).
- 421 Advanced Petrology (3).
- 423 Electron Microprobe Analysis (3).
- 424 Stratigraphy (3).
- 426 Metamorphic Petrology (3).
- 427 Igneous Petrology (3).
- 428 Trace Element Geochemistry (3).
- 429 Seminar in Petrology (1-3).
- 433 Advanced Paleontology (3).
- 440 Economic Geology (4).
- 442 Chemistry of Diagenetic Reactions in Sedimentary Rocks (3).
- 445 Clay Mineralogy (3).
- 450 Research (1-8).
- 451 Advanced Hydrogeology (1-2).
- 456 Scanning Electron Microscopy (1).
- 490 Research (cr. arr.)

GERMANIC AND SLAVIC LANGUAGES

- 201 Topics (cr. arr.)
- 203 Advanced German Reading (3).
- 206 German Conversation and Composition II (3).
- 207 Intensive Beginning German (3).
- 275 German Classics (3).
- 296 Honors in German (1-3).
- 301 Topics in German (cr. arr.)
- 306 German Conversation and Composition III (3).
- 308 Enlightenment and Sturm und Drang (3).
- 312 German Drama of the Nineteenth Century (3).
- 313 The German Novelle (3).
- 315 Faust (3).
- 333 German Drama I (3).
- 334 German Drama II (3).
- 336 German Prose (3).
- 338 German Poetry (3).
- 350 Special Readings (1-3).
- 351 German Romanticism (3).
- 360 Recent German Literature (3).
- 375 Medieval German Literature 1170-1210 (3).
- 380 Study in the Techniques of Teaching German (3).
- 381 Advanced Grammar, Syntax and Stylistics (3).
- 382 Contrastive Linguistics (3).
- 383 Internship in German (3).
- 400 Problems (cr. arr.)
- 401 Topics in German (cr. arr.)
- 402 Bibliography and Methods (1).
- 410 Seminar (3).
- 450 Research (cr. arr.)
- 460 History of the German Language (3).
- 461 Middle High German (3).
- 490 Research (cr. arr.)

GREEK

- 207 Intensive Beginning Greek I (3).
- 208 Intensive Beginning Greek II (3).
- 209 Intensive Greek Reading (2).
- 210 Intermediate Readings (3).
- 303 Greek Stylistics (1-3).
- 304 Greek Tragedy (3).
- 305 Greek Comedy (3).
- 306 Greek Lyric Poetry (3).
- 307 Greek Oratory (3).
- 308 Greek Philosophers (3).
- 310 Greek Historians (3).
- 315 Homer (3).
- 325 Greek Epigraphy (3).
- 350 Special Readings (1-3).
- 399 Survey of Greek Literature (3).
- 425 Seminar in Greek Drama (3).
- 440 Seminar in Greek Lyric Poetry (cr. arr.)
- 450 Seminar in the Greek Philosophers (3).
- 460 Seminar in the Greek Historians (3).
- 470 Seminar in Greek Epic Poetry (3).
- 475 Seminar on the Age of Pericles (3-6).
- 480 Seminar in Special Fields (3).

HEALTH SERVICES MANAGEMENT

- 201 Topics in Health Services Management (1-3).
- 202HM Portfolio Assessment (1).
- 210HM The American Health Care System (3).
- 215 Principles of Health Care Management (3).
- 220HM Organization and Management of Health Care Institutions (3).
- 230HM Human Resources Development (3).
- 250HM Health Planning Principles (3).
- 260HM Legal Aspects of Health Care (3).
- 270HM Principles of Health Care Finance (3).
- 289HM Practicum (3-6).
- 300 Problems (1-3).
- 310 The Health Care System (3).
- 330 Risk Management System in a Health Care Institution (3).
- 340HM Economics of Health Care (3).
- 376 Computers and Health Services Applications (3).
- 400 Problems (1-3).
- 401 Topics in Health Services Management (3).
- 410 Applied Empirical Methods in Health Program Evaluation (3).
- 424 Public Health and Medical Care Economics (3).
- 442 Labor Relations in the Health Industry (3).
- 450 Research (1-99).
- 460 Administration of Health Care Organizations (3).
- 461 Design of Health and Human Service Systems (3).
- 470 Community and Institutional Health Planning (3).
- 471 Application of Management Science to the Health Care System (3).
- 472 Financial Management for Health Care Organizations (3).
- 473 Decision Making for Health Care Organizations (3).
- 474 Health Care Law and Ethics (3).
- 475 Strategic Planning and Marketing for Health Care Organizations (3).
- 476 Health Facilities Program Planning Design and Evaluation (3).
- 478 Organization and Management for Mental Care (3).
- 489 Field Experience in Health Services Management (cr. arr.)

HEALTH RELATED PROFESSIONS

- 225 Special Readings (1-3).
- 300 Problems (cr. arr.)
- 301 Topics (1-3).
- 303PT Current issue in Physical Therapy (4).
- 460 Seminar: Contemporary Topics in Speech and language Pathology (1-3).
- 461 Seminar: Contemporary Topics in Audiology (1-3).

HIGHER AND ADULT EDUCATION AND FOUNDATIONS

- K260 Topics in Higher and Adult Education (cr. arr.)
- K301 Foundations of Adult Education (3).
- K325 Institutional Advancement for High Education (3).
- K377 Women and Minorities in Higher Education (3).
- K400 Problems in Higher Education (cr. arr.)
- K410 Seminar in Higher Education (cr. arr.)
- K411 Seminar in Adult Education (1-3).
- K420 Administration and Supervision of Adult Education (2-3).
- K440 Improvement in Instruction in Adult Education (2-3).
- K441 Curriculum Development in Adult Education (3).
- K460 Topics in Higher and Adult Education (cr. arr.)
- K462 Foundations of Student Affairs Administration (3).
- K463 Student Affairs Administration: Methods & Programs (3).
- K465 The Junior College (2).
- K468 College Teaching (2-3).
- K475 College Administration (2-3).
- K480 Internship in Higher Education (cr. arr.)
- K490 Research in Higher Education (cr. arr.)

HISTORY

- 201 Topics (cr. arr.)
- 202 America's Environmental Experience (1-8).
- 205 The Greek World (3).
- 206 The Roman World (3).
- 208 The Development of Greek Democracy (3).
- 209 Alexander the Great and the Hellenistic World (3).
- 210 History of Missouri (3).
- 215 American Feminism (3).
- 221 Europe in the Nineteenth Century (3).
- 231 Contemporary Europe (3).
- 235 Religious Biography: Black Religion (3).
- 251 Twentieth Century America (3).
- 252 America in the 1960's (3).
- 262 The Military and Wars in American Society (3).
- 282 History of British India (3).
- 297 Honors Thesis (3).
- 298 Honors Thesis (3).
- 300 Special Problems (cr. arr.)
- 301 Topics (cr. arr.)
- 307 The Roman Revolution (3).
- 310 The Roman Empire (3).
- 311 The Later Roman Empire (3).
- 317 History of Socialist Thought (3).
- 318 Medieval Culture (3).
- 319 Intellectual History of Europe, 17th and 18th Centuries (3).
- 320 Intellectual History of Europe, 19th and 20th Centuries (3).
- 321 Tudor England (3).
- 322 Stuart England (3).
- 323 English Legal and Constitutional History (3).
- 326 Modern England (3).
- 327 The Age of the Renaissance (3).
- 328 The Age of the Reformation (3).
- 331 Revolutionary France, 1789-1851 (3).
- 333 Germany in the Nineteenth Century (3).
- 334 Germany in the Twentieth Century (3).
- 335 Modern France 1815 to Present (3).
- 338 Medieval Russian Culture (3).
- 339 Imperial Russia, 1682-1825 (3).
- 340 The Russian Revolution (3).
- 341 Sino-Soviet Conflict (3).
- 342 Age of Jefferson (3).
- 343 Age of Jackson (3).
- 344 American Constitutional History to 1860 (3).
- 345 American Constitutional History Since 1860 (3).
- 346 History of American Law (3).
- 349 American Social History Since 1865 (3).
- 350 Special Readings (cr. arr.)
- 351 American Cultural and Intellectual History to 1865 (3).
- 352 American Cultural and Intellectual History Since 1865 (3).
- 353 American Urban History (3).
- 356 Origins of Modern America, 1877-1918 (3).
- 357 Recent United States History 1918-1945 (3).
- 358 Our Times: United States Since 1945 (3).
- 359 History of the Old South (3).
- 360 History of the New South (3).
- 361 The Great West in American History (3).
- 362 The Ordeal of the Union, 1848-1877 (3).
- 363 American Colonial History to 1760 (3).
- 364 The Period of the American Revolution, 1760-1789 (3).
- 365 History of the American Environment (3).
- 367 American Legal History to 1870 (3).
- 368 American Legal History Since 1870 (3).
- 369 History of Caribbean America (3).
- 370 American Foreign Policy from Colonial Times to 1898 (3).

- 373 History of United States Foreign Relations, 1898 to the Present (3).
 375 Historic Preservation (3).
 377 History of Mexico (3).
 378 Social Revolution in Latin America (3).
 384 Religion and Politics in Modern India, 1857-1947 (3).
 391 Afro-Americans in the Twentieth Century (3).
 399 Quantitative Methods in Historical Study (3).
 403 Readings in South Asian History (3).
 406 Seminar in Ancient History (3).
 407 Readings in Ancient History (3).
 410 Introduction to Historical Research (3).
 411 Readings in Russian History (3).
 412 Historiography (3).
 420 Independent Readings for History Ph.D. Comprehensive Examination (cr. arr.)
 421 Seminar in British History (3).
 423 Readings in English History (3).
 425 Seminar in Medieval Culture (3).
 427 Seminar in the Renaissance and Reformation (3).
 428 Readings in Early Modern European History (3).
 431 Readings in Modern European History (3).
 432 Seminar in Modern European History (3).
 435 Readings in French History (3).
 436 Readings in American Colonial History (3).
 437 Seminar in the History of Colonial America (3).
 438 Readings in Afro-American History (3).
 439 Seminar in Afro-American History (3).
 441 Seminar in the National Period of United States History (3).
 442 Readings in the Age of the Federalists and the Jeffersonians (3).
 443 Readings in the Age of Jackson 1824-1850 (3).
 444 Readings in American Urban History (3).
 447 Readings in Sectional Controversy, Civil War and Reconstruction (3).
 449 Seminar in American Social History (3).
 450 Research (cr. arr.)
 451 Seminar in American Cultural and Intellectual History (1-12).
 452 Readings in American Cultural and Intellectual History (3).
 453 Seminar in United States Sectionalism, Civil War & Reconstruction (3-12).
 454 Readings in American Western and Environmental History (3).
 455 Seminar in American Western and Environmental History (3-6).
 460 Readings in the History of the South (3).
 461 Seminar in the History of the South (3).
 464 Readings in the Origins of Modern America (3).
 465 Readings in Recent United States History (3).
 467 Seminar in the Origins of Modern America (3).
 468 Seminar in Recent United States History (1-12).
 470 Readings in Latin American History (1-6).
 480 Readings in the History of American Diplomacy (3).
 481 Seminar in Recent American Diplomatic Problems (3).
 490 Research (cr. arr.)
 491 Seminar in European Intellectual History (3).

HOME ECONOMICS

GENERAL HOME ECONOMICS

- 310 Senior Seminar (0).
 355 Recent Trends in Home Economics (1-3).
 412 Introduction to Research in Home Economics (1).
HOME ECONOMICS COMMUNICATIONS
 300 Problems (cr. arr.)
 318 Topics (cr. arr.)
 350 Readings (cr. arr.)
 355 Recent Trends (1-2).
 390 Field Training (4).
 400 Problems (cr. arr.)
 410 Seminar (1-4).
 415 Readings (cr. arr.)
 418 Topics (cr. arr.)
 450 Research (cr. arr.)
 490 Research (cr. arr.)

HONORS COLLEGE

HONORS-GENERAL

- 200GH Colloquium (2-3).

HORTICULTURE

- 201 Ornamental Woody Plants I (3).
 202 Ornamental Woody Plants II (3).
 203 Plant Propagation (3).
 204 Plant Environments (3).
 205 Plant Nutrition (3).
 206 Plant Protection (3).
 207 Plant Origin and Development (3).
 250 Landscape Graphics (3).
 252 Planting Design I (3).
 254 Landscape Design (3).
 257 Construction Materials (3).
 266 Plant Forcing Structures (3).
 272 Planting Design II (3).
 300 Problems (cr. arr.)
 301 Post-Harvest Physiology (3).
 309 Herbicides in Agronomic Habitats (3).
 323 Diseases of Ornamentals and Turf (2).
 327 Plant Tissue Culture (3).

- 330 Fruit Production (5).
 344 Commercial Vegetable and Truck Crop Growing (5).
 350 Landscape Graphics Communication (3).
 354 Advanced Landscape Design (4).
 355 Turf (3).
 356 Arboriculture (3).
 357 Nursery Crop Production and Management (4).
 361 Fall Greenhouse Crops (4).
 362 Spring Greenhouse Crops (4).
 390 Horticulture Internship (1-8).
 402 Topics in Horticulture (cr. arr.)
 406 Plant Growth Regulating Substances (3).
 407 Breeding of Horticultural Plants (cr. arr.)
 408 Nutrition of Horticultural Plants (3).
 410 Seminar (1).
 415 Methods of Horticultural Research (3).
 444 Advanced Olericulture (3).
 450 Non-Thesis Research (cr. arr.)
 490 Research (cr. arr.)

HOUSING AND INTERIOR DESIGN

- 244 History of Housing and Interior Design to 1750 (3).
 245 History of Housing and Interior Design after 1750 (3).
 247 Interior Design II (3).
 248 Housing Design I (3).
 300 Problems (cr. arr.)
 318 Topics (cr. arr.)
 340 Design and Behavior (3).
 341 Computer-Graphic Applications to Design (3).
 342 Design Communication II (3).
 346 Housing Concepts and Issues (3).
 347 Interior Design III (3).
 348 Housing Design II (3).
 349 Advanced Design studio (3-1.2).
 350 Readings (cr. arr.)
 355 Recent Trends (cr. arr.)
 390 Field Training (cr. arr.)
 400 Problems (cr. arr.)
 410 Seminar (1-4).
 412 Research Methods in Housing & Interior Design (3).
 415 Readings (cr. arr.)
 418 Topics (cr. arr.)
 441 Advanced Interior Design (4).
 446 History of Accessories in Interior Design (3).
 450 Research (cr. arr.)
 490 Research (cr. arr.)

HUMAN NUTRITION, FOODS, & FOOD SYSTEMS MANAGEMENT

- 221 Science of Food Preparation (3).
 224 Meat Selection and Identification (3).
 228 Principles of Food Systems Management (3-4).
 234 Human Nutrition I (3).
 235 Nutrition Education (3-5).
 236 Evaluation of Nutritional Status (3).
 238 Diet Therapy for Health Professionals (3-4).
 300 Problems (cr. arr.)
 318 Topics (cr. arr.)
 320 Cultural Food Patterns (2).
 321 Experimental Foods (3).
 322 Food Experiences for Children (3).
 323 Modern Methods of Food Preservation (3).
 324 Food Production in Foodservice Systems (5).
 325 Food Procurement and Fiscal Management (6).
 326 Development, Utilization and Maintenance of Physical Resources (2-4).
 327 Operations Analysis in Food Systems (3-4).
 328 Management of Food Systems (1-8).
 330 Child Nutrition (3).
 333 Human Nutrition II Laboratory (1).
 334 Human Nutrition II Lecture (3).
 335 Nutrition During the Life Cycle (3).
 338 Diet Therapy (3-6).
 339 Medical Dietetics (3-12).
 350 Readings (cr. arr.)
 355 Recent Trends (1-2).
 375 Sensory Analysis of Food (3).
 376 Microwave Heating of Food (2).
 390 Field Training (cr. arr.)
 400 Problems (cr. arr.)
 410 Seminar (1-4).
 412 Research Methodologies for Food Systems Management (2).
 415 Readings (cr. arr.)
 418 Topics (cr. arr.)
 419 Field Training (cr. arr.)
 421 Advanced Experimental Foods (3).
 428 Advanced Food Systems Management (3).
 431 Nutritional Perspectives (3).
 432 Nutritional Integration of Metabolism (3).
 433 Methods of Nutrition Research (3).
 436 Advanced Nutrition (3).
 450 Research (cr. arr.)
 490 Research (cr. arr.)

INDUSTRIAL ENGINEERING

- 281 Industrial Systems Design I (3).
 300 Problems (1-4).
 301 Topics in Industrial Engineering (3).
 307 Operations Research Methods (3).
 337 Reliability I (3).

- 339 Evaluation of Engineering Data (3).
 340 Experimental Design (3).
 349 Engineering Quality Control (3).
 351 Plant Layout and Materials Handling (3).
 358 Economic Studies in Engineering (3).
 360 Measurement of Human Work (3).
 361 Introduction to Human Factors Engineering (3).
 371 Applied Robotics in Production (3).
 372 Integrated Production Systems (3).
 376 Survey of Operations Research Models (3).
 381 Industrial Systems Design II (4).
 382 Industrial Engineering Seminar (1).
 383 Management Information Systems Design (3).
 384 Industrial Process and Distribution Control Systems (3).
 385 Manufacturing Systems Design (3).
 387 Linear Programming (3).
 388 Industrial Systems Simulation (3).
 397 Operations Research Models (3).
 398 Scheduling Systems (3).
 400 Problems (cr. arr.)
 401 Advanced Topics in Industrial Engineering (3).
 404 Industrial Engineering Graduate Seminar (1).
 405 Research Methods in Industrial Engineering (1).
 408 Management of the Engineering Function (3).
 411 Scientific Management (3).
 415 Advanced Economic Studies in Engineering (3).
 431 Stochastic Service Systems (3).
 432 Advanced Stochastic Service Systems (3).
 437 Reliability II (3).
 439 Quality Control Systems (3).
 440 Advanced Evaluation of Engineering Data (3).
 460 Design and Measurement of Work Systems (3).
 461 Health Care Systems Design I (3).
 462 Health Care Systems Design II (3).
 463 Disease Diagnosis and Treatment (3).
 465 Human Work Performance (3).
 468 Human Factors (3).
 470 Operations Research Applications (3).
 471 Advanced Methods of Operations Research (3).
 472 Nonlinear Optimization (3).
 475 Inventory Control Systems (3).
 480 Linear Programming Applications (3).
 483 Advanced Management Information Systems Design (3).
 484 Dynamic Programming (3).
 487 Advanced Linear Programming (3).
 488 Integer Programming (3).
 490 Research (cr. arr.)

INFORMATION SCIENCE

- 302 Information Systems I (3).
 303 Microcomputers in Library (2-3).
 305 Access to Electronic Information (3).
 350 Special Readings (cr. arr.)
 400 Problems (cr. arr.)
 401 Library Information Systems (5).
 402 Information Systems II (3).
 410 Seminar in Information Science (1-3).
 412 Information Storage and Retrieval (3).
 413 Abstracting and Indexing (3).
 432 Automated Reference Services (3).
 441 Information Systems Resource Management (3).

ITALIAN

- 201 Topics (cr. arr.)
 206 Advanced Italian Composition (3).
 207 Intensive Beginning Italian (3).
 209 Advanced Italian Conversation (3).
 297 Honors Thesis in Italian (3).
 301 Topics (cr. arr.)
 311 Survey of Italian Literature I (3).
 312 Survey of Italian Literature II (3).
 319 Nineteenth-Century Italian Literature (3).
 321 Dante (3).
 350 Special Readings (1-3).
 400 Problems (cr. arr.)

JOURNALISM

- 231 Economic Analysis for Journalists (3).
 238 Basic Business Communications (3).
 266 The Agricultural Press (3).
 300 Mass Media and Society (2).
 301 Topics in Journalism (1-3).
 302 The Foreign Press (2).
 303 International Journalism (2).
 304 Communications Law (3).
 305 Critical Reviewing (2).
 306 Reporting (3).
 307 Advanced Reporting (3).
 308 Law and the Courts (2).
 309 History and Principles of Journalism (3).
 310 Newspaper Editing (3).
 311 Advanced Newspaper Editing and Design (3).
 314 Basic Issues in the News (3).
 315 Reporting of Public Affairs (3).
 316 Science Writing (3).
 317 Women and the Media (2).
 318 Introduction to Selling for the Mass Media (2).
 319 Dynamics of Advertising Laboratory (1).
 320 Dynamics of Advertising (2).

321 Advertising Copy, Layout and Production (3).
 322 Psychology in Advertising (2).
 323 Advertising Salesmanship (3).
 324 Advertising and Public Relations Campaigns (2).
 325 Media Promotion (2).
 326 Broadcast Advertising (3).
 327 Direct and Mail Order Advertising (2).
 328 Retail Advertising (2).
 329 Creative Strategy and Tactics (2).
 330 Media Strategy and planning (2).
 331 Advertising Management (2).
 332 Public Relations (3).
 333 Research in Advertising (2).
 334 International Advertising (2).
 335 Sales Promotion (3).
 336 The Graphics of Journalism (2).
 338 Business and Economics Reporting (3).
 340 Visual Communications (3).
 341 Staff Photography (3).
 342 Photojournalism (4).
 344 Intermediate Press Photography (2).
 345 General Semantics in Journalism (2).
 351 Television News Photography (2).
 352 Editorial Writing (3).
 353 Broadcast Reporting (3).
 354 Editorial Page Direction (2).
 355 Radio Reporting and Editing (3).
 356 Television News Producing (3).
 357 Issues in Broadcast Management (2-3).
 358 Television Reporting and Editing (3).
 359 Seminar in Radio-TV News (3).
 360 Intermediate Writing (3).
 361 Advanced Writing (3).
 362 Magazine Design (3).
 363 Magazine Editing (3).
 364 Organization Communication in Public Relations (2).
 365 Magazine Production (3).
 366 Advanced Magazine Design (2).
 367 American Magazine History (2).
 368 Magazine Publishing (2).
 373 The Community Newspaper (3).
 374 The Suburban Press (2).
 375 Newspaper Management (2).
 376 Newspaper Circulation and Marketing (2).
 380 High School Journalism (2).
 382 Broadcast Public Affairs (3).
 384 Developing Nations and the Communications Explosion (2).
 386 Economics of the Media (2).
 387 Journalism as Communication (2).
 390 History of Mass Media (3).
 392 Intersession Colloquium (1).
 395 Area Seminar (3).
 399 Management in Media (2-3).
 400 Problems (1-4).
 401 Seminar in History and Principles of Journalism (3).
 402 Theory of Mass Communication (3).
 403 The Literature of Journalism (2).
 404 Theory of International Communications (2).
 406 Advanced Seminar, Theory of Communication (2).
 407 Information Theory (3).
 410 Philosophy of Journalism (2).
 420 Readings in Journalism (1-5).
 422 Mass Media Seminar (3).
 424 Controls of Information (3).
 425 Controls of Information (3).
 428 Seminar in Communications Law (2).
 433 Proseminar in Communications (2).
 459 Seminar in Radio/TV News (3).
 487 Journalism as Communication (2).
 488 Research Methods in Journalism (3).
 489 Advanced Research Methods (3).
 490 Research (1-8).
 491 Graduate Assembly (0).
 495 Area Seminar (3).
 499 Area Problem (4-8).

LABORATORY ANIMAL MEDICINE

358 Laboratory Animals in Research & Teaching (1).
 400 Problems (cr. arr.)
 410 Seminar (1).
 437 Pathology of Laboratory Animals (4).
 444 Diseases of Laboratory Animals (3).
 450 Research (cr. arr.)
 468 Laboratory Animal Biology (3).
 469 Laboratory Animal Resource Management (3).
 475 Methodology of Animal Experimentation (1).
 490 Research (cr. arr.)

LATIN

207 Intensive Beginning Latin I (3).
 208 Intensive Beginning Latin II (3).
 209 Intensive Latin Reading (2).
 210 Latin Poetry (3).
 300 Problems (cr. arr.)
 303 Latin Stylistics (1-3).
 305 Age of the Scipios (3-6).
 310 Age of Cicero (3-6).
 315 Vergil (3).
 320 Augustan Literature (3-6).
 325 Latin Epigraphy (3).

335 Neronian Literature (3-6).
 340 Age of Pliny and Tacitus (3-6).
 350 Special Readings (1-3).
 376 Medieval Latin (3).
 399 Survey of Latin Literature (3).
 410 Seminar in Roman Comedy (3).
 420 Seminar in Latin Lyric and Elegiac Poetry (3).
 430 Seminar in Neronian Literature (3).
 450 Seminar in Roman Historians (3).
 470 Seminar in Latin Epic Poetry (cr. arr.)
 475 Seminar in the Augustan Age (3-6).
 480 Seminar in Special Fields (3).

LAW

220L Constitutional Law (4).
 221L Evidence (4).
 223L Legal Accounting (2).
 224L Remedies (3).
 225L Business Organizations (4).
 227L Basic Federal Income Taxation (4).
 228L Estates and Trusts I (3).
 232L Appellate Advocacy (1).
 300L Administrative Law (3).
 301L Admiralty Law (2-3).
 302L Advanced Business Organizations (2-3).
 303L Advanced Labor Law (2-3).
 304L Advanced Criminal Procedure (2).
 305L Advanced Torts (2).
 306L Agricultural Law (3).
 307L Antitrust Law (3).
 308L Arbitration and Labor Problems (3).
 309L Advanced Antitrust Law (2-3).
 310L Bankruptcy (2-3).
 311L Basic Commercial Law (4).
 313L Business Planning (2).
 314L Client Interviewing and Counseling (2).
 315L Capital Punishment (2).
 316L Clinical Placement (1-3).
 317L Commercial Paper and Banking Transactions (2-3).
 319L Comparative Law (2-3).
 320L Conflict of Laws (2-3).
 321L Conveyances and Title Examination (2).
 322L Federal Protection of Civil Rights and Liberties (2-3).
 323L Creditors' Remedies (3).
 325L Criminal Law Administration (2).
 326L Commercial Transactions I (3).
 327L Commercial Transactions II (3).
 328L Drafting of Legal Instruments (2).
 329L Employment Discrimination (2-3).
 330L Environmental Law (2-3).
 331L Estate and Gift Taxation (3).
 332L Estate Planning (2).
 334L Estates and Trusts II (3).
 335L Family Law (3).
 337L Federal Courts (3).
 338L Federal Income Taxation of Business Enterprises (3-4).
 340L Future Interests (3).
 341L Government Regulation of Business (3).
 343L Insurance Law (2-3).
 344L Intellectual Property (2-3).
 346L International Business Transactions (2-3).
 347L International Law (3).
 349L International Transactions (3).
 350L Jurisprudence (2).
 352L Juvenile Law (2-3).
 353L Labor Law (3).
 355L Land Use Controls (3).
 356L Law and Medicine (2).
 358L Legal History (2-3).
 360L Legislation (3).
 361L Mediation (3).
 362L Local Government Law (2-3).
 363L Mining, Oil, and Gas (2-3).
 364L Mental Disorders and the Criminal Law (2).
 365L Natural Resources (3).
 366L Negotiation (2-3).
 367L Partnership Law and Taxation (2-3).
 368L Pension and Profit Sharing (2).
 369L Problems in Environmental Control (2).
 370L Products Liability (2).
 371L Problems in Practice (1-2).
 372L Professional Responsibility (2).
 375L Real Estate Finance (3).
 377L Restitution (1-2).
 378L Sales (1-2).
 380L Securities Regulation (3).
 381L Social Legislation (2-3).
 382L State and Local Taxation (2).
 383L Tax Policy (3).
 384L Trial Practice (2-4).
 386L Urban Problems (2).
 387L Water Law (2-3).
 389L Selected Seminar Topics (2).
 390L Law Review (1-3).
 391L Advanced Advocacy Research (1-2).
 392L Research (1-3).

LIBRARY SCIENCE

205 Library Resources and Bibliography (1-3).
 211 Elementary Cataloging (3).
 231 Elementary Reference (3).
 241 Libraries and Librarianship (2).

301 Topics (1-99).
 312 Principles of Cataloging and Classification (5).
 320 Introduction to Archives and Manuscripts (3).
 321 Library Materials for Children and Youth (3).
 322 Literature of the Humanities (3).
 323 Literature of the Social Sciences (3).
 324 Literature of Science and Technology (3).
 325 Use of Public Documents and Records (3).
 326 Developing Library Collections (2).
 327 Preservation and Restoration (3).
 332 Bibliography and Reference (5).
 341 Management of Information Agencies (3).
 342 The Administration of School Libraries/Media Centers (3).
 350 Special Readings (cr. arr.)
 351 Library Research in Special Areas (cr. arr.)
 380 Practicum (2-3).
 400 Problems (cr. arr.)
 410 Seminar in Library Science (1-3).
 416 Medical Subject Analysis (3).
 424 Micrographics and Libraries (3).
 425 Government Publications (3).
 426 Multimedia Resources of Libraries (3).
 429 Seminar in Rare Books and Manuscripts (3).
 433 Services to Children (3).
 435 Studies in Library Services (3-6).
 443 The Academic Library (3).
 444 The Public Library (3).
 445 Special Libraries and Information Centers (3).
 446 Health-Science Librarianship and Bibliography (3).
 447 Archive Administration (3).
 448 Seminar in Records and Manuscript Management (3).
 449 History of Libraries (3).
 450 Research (cr. arr.)
 451 The Biomedical Community (3).

LINGUISTICS

201 Topics (cr. arr.)
 210 Japanese III (3).
 211 Japanese Readings (3).
 212 Speech Science (3).
 235 Philosophy and Language (3).
 270 Culture as Communication (3).
 290 Honors Thesis (3).
 301 Topics (cr. arr.)
 306 Sociolinguistics (3).
 308 Historical Linguistics (3).
 309 Topics in Linguistics (3-6).
 311 History of the French Language (3).
 312 Psychosocial Aspects of Speech (3).
 313 History of the Greek and Latin Languages (3).
 314 Symbolic Logic (3).
 319 The Structure of American English (3).
 320 History of the English Language (3).
 322 Regional and Social Dialects of American English (3).
 323 Principles of Teaching English as a Second Language (3).
 335 Philosophy and Language (3).
 346 Language and Culture (3).
 350 Special Readings (1-3).
 360 Phonetics (3).
 361 History of the Spanish Language (3).
 371 Introduction to General Linguistics (3).
 372 Techniques in Linguistic Analysis (3).
 373 Linguistic Phonetics (3).
 374 Issues in Linguistic Analysis (3).
 378 Structure of Modern French (3).
 379 Structure of Modern Spanish (3).
 383 Studies in Linguistics (3).
 393 Field Methods in Linguistics (4).
 400 Problems (cr. arr.)
 410 Acoustic Phonetics (3).
 411 Physiological Phonetics (3).
 417 Studies in the English Language (3).
 418 Introduction to Old English (3).
 428 Studies in Psycholinguistics (3).
 446 Seminar in Anthropological Linguistics (3).
 460 History of the German Language (3).
 461 Middle High German (3).
 483 Seminar (3).
 490 Research in Linguistics (cr. arr.)
 493 Phonology (3).
 494 Syntax (3).

MANAGEMENT

202 Fundamentals of Management (3).
 254 Introduction to Business Law (3).
 255 Legal Aspects of Business Organization and Operation (3).
 300 Problems (cr. arr.)
 305 Elements of the Law of Business (3).
 308 Operations Management (3).
 310 Personnel Management (3).
 311 Collective Bargaining (3).
 318 Management Science (3).
 319 Production Systems Analysis (3).
 320 Personnel Administration Law (3).
 329 Organizational Behavior (3).
 330 Organizational Theory (3).
 335 Topics in Management (3).
 345 Management of Service Operations (3).
 347 Compensation Theory and Practice (3).

353 Selected Problems in Personnel Management (3).
356 The Law of Commercial Credit Transactions (3).
360 Venture Management (3).
375 Management Policies and Problems (3).
380 Statistical Forecasting (3).
383 Advanced Organizational Behavior (3).
384 Advanced Organization Theory (3).
400 Problems (cr. arr.)
405 Seminar in Management (cr. arr.)
418 Business and Economic Research (3).
434 Advanced Problems in Compensation Theory (3).
435 Topics in Management (3).
436 Advanced Personnel Management (3).
437 Management of Labor Relations (3).
438 Organizational Behavior and Group Dynamics (3).
439 Organizational Theory and Design (3).
440 Organizational Change and Development (3).
446 Operations Planning (3).
447 Operations Scheduling and Control (3).
448 Operations Policy (3).
490 Research (cr. arr.)

MARKETING

204 Principles of Marketing (3).
206 Distribution Systems (3).
300 Problems (cr. arr.)
309 Marketing Management (3).
313 Marketing Research (3).
314 Consumer Behavior (3).
335 Management of Promotion (3).
336 Sales Management (3).
338 Business and Economic Reporting (3).
347 Channel Management (3).
350 Marketing, Society, and Government (3).
355 Contemporary Issues in Marketing (3).
358 Purchasing (3).
360 Quantitative Analysis in Marketing (3).
371 World Marketing (3).
373 Distribution Management (3).
380 Statistical Forecasting (3).
381 Transportation Policy (3).
390 Marketing Policy (3).
400 Problems (cr. arr.)
401 Seminar in Marketing (4).
413 Advanced Marketing Research (3).
418 Business and Economic Research (3).
423 Business Logistics (3).
444 Advanced Consumer Behavior (3).
465 Marketing Strategy (3).
466 Quantitative Methods for Marketing (3).
468 Distribution Strategy (3).
470 International Marketing (3).
471 Markets in Transition (3).
490 Research (cr. arr.)

MATHEMATICS

201 Calculus III (3).
205 Selected Topics in Analysis (3).
207 Calculus for Social and Natural Sciences I (3).
208 Calculus for Social and Natural Sciences II (3).
226 Discrete Mathematical Structures (3).
231 Elementary Matrix Theory (3).
250 Survey of Mathematics (3).
298 Honors (2).
299 Honors (2).
301 Topics (cr. arr.)
302 Advanced Calculus With Applications (3).
304 Differential Equations (3).
305 Introduction to Complex Variables (3).
307 Operational Methods (3).
309 Applied Analysis (3).
310 Advanced Calculus I (3).
311 Advanced Calculus II (3).
320 Introduction to Mathematical Statistics (3).
323 Numerical Analysis (3).
324 Numerical Linear Algebra (3).
325 Introduction to Probability Theory (3).
326 Statistical Inference I (3).
330 Theory of Equations (3).
331 Matrix Theory (3).
333 Higher Algebra (3).
335 Theory of Numbers (3).
337 Applied Modern Algebra (3).
340 Introduction to Abstract Algebra I (3).
341 Introduction to Abstract Algebra II (3).
350 Special Readings (1-3).
355 History of Mathematics (3).
358 Mathematical Logic (3).
360 College Geometry (3).
362 Projective Geometry (3).
366 Foundations of Geometry (3).
367 Introduction to Non-Euclidean Geometry (3).
372 Introduction to Topology (3).
400 Problems (1-3).
404 Theory of Functions of Real Variables I (3).
405 Theory of Functions of Real Variables II (3).
408 Partial Differential Equations (3).
409 Functional Analysis I (3).
410 Functional Analysis II (3).
412 Calculus of Variations I (3).
413 Complex Analysis I (3).
414 Complex Analysis II (3).

418 Nonlinear Differential Equations (3).
420 Topological Dynamics (3).
423 Advanced Numerical Analysis (3).
424 Theoretical Numerical Analysis (3).
425 Special Functions (3).
426 Advanced Ordinary Differential Equations I (3).
427 Advanced Ordinary Differential Equations II (3).
429 Topics in Analysis (cr. arr.)
430 Topics From Algebra (cr. arr.)
432 Algebra I (3).
433 Algebra II (3).
434 Topics in Algebra (3).
440 Advanced Probability (3).
441 Stochastic Processes (3).
449 Topics in Applied Mathematics (cr. arr.)
456 Differentiable Manifolds and Riemannian Geometry (3).
457 Differential Geometry for Scientists and Engineers (3).
458 Differential Geometry I (3).
460 Topics of Geometry (cr. arr.)
468 General Topology I (3).
469 General Topology II (3).
470 Introduction to Algebraic Topology (3).
479 Topics in Topology (cr. arr.)
480 Analysis Seminar (cr. arr.)
482 Algebra Seminar (cr. arr.)
484 Geometry Seminar (cr. arr.)
486 Topology Seminar (cr. arr.)
488 Applied Mathematics Seminar (cr. arr.)
489 Masters Project (3).
490 Research (cr. arr.)

MECHANICAL AND AEROSPACE ENGINEERING

201 Topics in Mechanical and Aerospace Engineering (3).
209 Engineering Thermodynamics II (3).
210 Introduction to Biomechanics (3).
224 Engineering Materials I (3).
234 Engineering Materials II (3).
251 Fluid Mechanics (3).
252 Instrumentation and Measurements Laboratory I (3).
256 Design of Machine Elements (4).
261 Thermodynamics of Compressible Flow (3).
262 Instrumentation and Measurements Laboratory II (3).
271 Aerodynamics (3).
276 Aerospace Structures I (3).
280 Manufacturing Methods (3).
285 Systems Dynamics (3).
296 Design Synthesis (3).
299 Heat Transfer (3).
300 Problems (cr. arr.)
301 Topics in Mechanical and Aerospace Engineering (3).
304 Digital Computer Applications in Engineering (3).
306 Design Analysis of Mechanisms (4).
310 Introduction to Bioengineering (3).
314 Material Science for Advanced Applications (3).
315 Engineering Evaluation of Energy Systems and Resources (3).
321 Creativity in Design (3).
325 Energy Methods in Mechanics (3).
326 Synthesis of Linkages (3).
331 Experimental Methods in Fluid Flow and Heat Transfer (3).
334 Introduction to X-Ray Diffraction (3).
336 Interactive Computer Graphics in Engineering Design (3).
339 Solar Energy Utilization (3).
350 Honors Research (cr. arr.)
351 Power Plant Design (3).
352 Advanced Mechanics of Materials (3).
353 Experimental Stress Analysis (3).
356 Digital Control of Mechanical Systems (3).
357 Automatic Control of Mechanical Systems (3).
360 Internal Combustion Engines (3).
365 Automotive Engineering (3).
366 Applied Mechanical Optimization (3).
371 Applied Robotics in Production (3).
372 Integrated Production Systems (3).
375 Introduction to Plasmas (3).
382 Lasers and Their Applications (3).
385 Vibration Analysis (3).
386 Introduction to Finite Element Methods (3).
389 Advanced Thermodynamics (3).
399 Intermediate Heat Transfer (3).
400 Problems (cr. arr.)
401 Advanced Topics in Mechanical and Aerospace Engineering (3).
404 Advanced Metallurgy Principles (3).
408 State Variable Methods in Automatic Control (3).
410 Seminar (1).
411 Continuum Mechanics (3).
412 Theory of Elasticity (3).
413 Theory of Plates and Shells (3).
414 Theory of Elastic Stability (3).
415 Aeroelasticity (3).
416 Theory of Plasticity (3).
418 Advanced Dynamics (3).
427 Dynamics of Machinery (3).
428 Vibrations of Distributed Parameter Systems (3).
430 Boundary Layer Theory (3).
434 Fracture Mechanics I (3).
435 Heat Transfer-Conduction (3).

436 Heat Transfer-Convection (3).
437 Heat Transfer-Radiation (3).
438 Introduction to Turbulence (3).
441 Physical Gas Dynamics (3).
444 Fracture and Fatigue Prevention in Engineering Practice (3).
445 Instrumentation Theory (3).
447 Magnetogasdynamics (3).
458 Dynamical Theory (3).
459 Dynamics of Structures (3).
460 Combustion (3).
486 Finite Element Methods (3).
490 Research (cr. arr.)

NUCLEAR ENGINEERING

MEDICAL PHYSICS

310 Survey of Medical Physics & Health Physics (1-3).
327 Nuclear Medicine Instrumentation (3).
403 Applied Topics in Medical Physics & Health Physics (1-6).
435 Physics of Diagnostic Radiology I (3).
439 Clinical Physics in Radiotherapy I (3).
445 Physics of Diagnostic Radiology II (3).
449 Clinical Physics in Radiotherapy II (3).

MEDICINE-INTERDISCIPLINARY

200M Problems (cr. arr.)
205M Social and Behavioral Sciences I (3).
206M Social and Behavioral Sciences II (2).
207M Social and Behavioral Sciences III (2).
208M Social and Behavioral Sciences IV (1).
220M Introduction to Clinical Medicine I (1).
221M Introduction to Clinical Medicine II (2).
222M Introduction to Clinical Medicine III (2).
240M Neurosciences I (5).
241M Neurosciences II (3).
SUMMER School of Medicine Summer Program (0).
WINTER FULL-TIME ENROLLMENT (1.8).

MICROBIOLOGY (MED)

205 Fundamentals of Medical and Public Health Microbiology (4).
301 Medical Microbiology (8).
304 Immunology (3).
314 Advanced Immunologic Techniques (3).
315 Bacterial and Viral Genetics (4).
340 Microbial Physiology (3).
400 Problems (cr. arr.)
401 Topics (cr. arr.)
403 Advanced Medical Microbiology (cr. arr.)
404 Pathogenic Mechanisms (cr. arr.)
405 Advanced Virology (3).
406 Medical Mycology (3).
407 Advanced Immunology (3).
410 Seminar (1).
430 Biochemical Genetics (3).
490 Research (cr. arr.)

MILITARY SCIENCE

262 The Military and Wars in American Society (3).

MUSIC

GENERAL

300 Problems (cr. arr.)
301 Topics (cr. arr.)
400 Problems (cr. arr.)
401 Topics (cr. arr.)
402 Introduction to Graduate Study (2).
420 Travel Seminar (1-4).
490 Research (cr. arr.)
499 Seminar (1-3).
MUSIC THEORY
203 Syntax, Structure and Style of Music V (2).
204 Syntax, Structure and Style of Music VI (2).
215 Composition III (2).
216 Composition IV (2).
303 Eighteenth-Century Counterpoint I (2).
304 Eighteenth-Century Counterpoint II (2).
305 Sixteenth-Century Counterpoint I (2).
306 Sixteenth-Century Counterpoint II (2).
307 Orchestration I (2).
308 Orchestration II (2).
309 Band Arranging (2).
310 Choral Arranging (2).
315 Composition V (2).
316 Composition VI (2).
331 Schenkerian Analysis (3).
333 Acoustics of Music (2).
344 Analysis of Music (2).
345 Introduction to Electronic Music (2).
402 Introduction to Graduate Study (3).
403 Analysis of Musical Styles I (2).
407 Advanced Orchestration I (2).
408 Advanced Orchestration II (2).
411 Comparative Approaches to Music Theory I (2).
412 Comparative Approaches to Music Theory II (2).
415 Composition VII (2).
444 Contemporary Analytical Techniques (2).

MUSIC HISTORY AND LITERATURE

- 221 Bach and His Time (3).
- 222 Haydn, Mozart and Beethoven (3).
- 223 Richard Wagner and the Music Drama (3).
- 224 Stravinsky and the 20th Century (3).
- 297 Honors in Music History (3).
- 298 Honors in Music History (3).
- 317 Graduate Review of Music History I (2).
- 318 Graduate Review of Music History II (2).
- 321 Music to 1600 (3).
- 322 Music in the 17th & 18th Centuries (3).
- 323 The Romantic Period (2).
- 324 Modern Music (2).
- 422 Studies in the History of American Music (2).
- 423 Studies in Music History I (2).
- 424 Studies in Music History II (2).
- 426 History of Performance Practices (2).
- 427 Studies in the History of Opera (2).
- 428 Studies in the History of Choral Music (2).

APPLIED MUSIC

- 255 Upper-class Individual Performance Study (1-3).
- 295 Junior Recital (1).
- 340 Individual Instruction in Instrumental and Vocal Techniques (1).
- 355 Advanced Upper-class Individual Performance Study (1-5).

- 395 Senior Recital (1).
- 455 Graduate Individual Performance Study (1-5).
- 495 Graduate Recital (1).

INSTRUMENTAL AND VOCAL TECHNIQUES

- 204 Undergraduate Seminar in Vocal Techniques (1).
- 242 Seminar in String Techniques (1).
- 243 Symposium in Instrumental Music (2).
- 244 Jazz Techniques: General (1).
- 245 Jazz Techniques: Improvisation (1).
- 246 Marching Band Techniques (2).
- 261 Accompanying Skills I (2).
- 262 Accompanying Skills II (2).
- 270 Diction in Singing: Italian (1).
- 271 Diction in Singing: German (1).
- 272 Diction in Singing: French (1).
- 361 Piano Pedagogy Survey I (2).
- 362 Piano Pedagogy Survey II (2).
- 363 Piano Pedagogy Lab (1).
- 431 Principles of Singing I (2).
- 432 Principles of Singing II (2).
- 433 Advanced Choral Conducting (2).
- 434 Advanced Instrumental Conducting (2).
- 461 Advanced Piano Pedagogy I (3).
- 462 Advanced Piano Pedagogy II (3).
- 466 Choral Techniques (3).

INSTRUMENTAL AND VOCAL REPERTORY

- 353 Piano Literature I (2).
- 354 Piano Literature II (2).
- 367 Vocal Literature I (2).
- 368 Vocal Literature (2).
- 382 Church Music (2).
- 453 Piano Repertory I (3).
- 454 Piano Repertory II (3).
- 465 Choral Repertory (2).
- 467 Vocal Repertory I (3).
- 468 Vocal Repertory II (3).
- 473 String Instrument Repertory I (1).
- 474 String Instrument Repertory II (1).
- 483 Organ Repertory I (1).
- 484 Organ Repertory II (1).

ENSEMBLE COURSES

- 266 Musical Theatre Performance (3).
- 330 Collegium Musicum (1).
- 341 Instrumental Ensemble (1-2).
- 342 Choral Ensemble (1-2).
- 343 Advanced Piano Ensemble (1).
- 346 Advanced Chamber Music (1).
- 365 Opera Production (cr. arr.)

NAVAL SCIENCE

- 235 Marine Navigation (3).
- 236 Naval Operations (3).
- 247 Management in the Naval Profession (2).
- 248 Administration in the Naval Profession (2).

NUCLEAR ENGINEERING

- 301 Topics in Nuclear Engineering (2-5).
- 302 Safe Handling of Radioisotopes (1).
- 303 Radiation Safety (3).
- 305 Survey of Nuclear Engineering (3).
- 306 Engineering Analysis (3).
- 315 Engineering Evaluation of Energy Systems and Resources (3).
- 320 Natural Resources and Nuclear Energy (3).
- 328 Introductory Radiation Biology (3).
- 341 Nuclear Chemical Engineering (3).
- 346 Introduction to Nuclear Reactor Engineering I (3).
- 349 Nuclear Engineering Materials (3).
- 350 Nuclear Methods in Bioenvironmental Studies (3).
- 353 Introduction to Fusion (3).
- 357 Nuclear Heat Transport (2).
- 365 Nuclear Power Engineering (3).
- 375 Introduction to Plasmas (3).
- 382 Lasers and Their Applications (3).
- 391 Nuclear Radiation Detection (3).
- 400 Problems (1-6).

- 401 Advanced Topics in Nuclear Engineering (3).
- 404 Nuclear Reactor Laboratory I (3).
- 405 Nuclear Reactor Laboratory II (3).
- 408 State Variable Methods in Automatic Control (3).
- 409 Interaction of Radiation with Matter (3).
- 410 Seminar (1).
- 411 Nuclear Reactor Theory I (3).
- 412 Nuclear Reactor Theory II (3).
- 421 Nuclear Pulse Analysis (3).
- 422 Radiation Shielding (3).
- 429 Radiation Dosimetry (3).
- 432 Nuclear Reactor Engineering (3).
- 434 Fracture Mechanics I (3).
- 444 Fracture and Fatigue Prevention in Engineering Practice (3).
- 451 Computational Methods of Reactor Analysis (3).
- 453 Fusion Theory (3).
- 455 Nuclear Reactor Kinetics and Control (3).
- 461 Neutron Transport Theory (3).
- 470 Fast Reactor Analysis (3).
- 471 Radiation Protection (3).
- 490 Research (cr. arr.)

NURSING

- 301 Special Topics in Nursing (1-3).
- 302 Health Appraisal of Individuals and Families (3).
- 303 Clinical Practicum and Role Development I (2).
- 310 Self-Care Deficit Theory I (3).
- 311 Self-Care Deficit Theory II (3).
- 326 Child Health Nursing (0-6 years) (3).
- 327 Child Health Nursing (6-18 years) (3).
- 330 Stress Management (3).
- 331 Legal Parameters of Nursing (3).
- 332 Physical Rehabilitation Nursing (2-3).
- 351 Community Mental Health Programs (3).
- 401 Topics in Advanced Clinical Nursing (3).
- 402 Research Methods in Nursing (3).
- 404 Teaching Nursing (3).
- 405 Teaching Practicum (3).
- 416 Gerontologic Nursing (3).
- 418 Communication Processes and Intervention (3).
- 420 Theories of Development and Psychopathology (3).
- 424 Family Dynamics and Intervention (3).
- 428 Advanced Child Health Nursing Practicum (3).
- 429 Roles and Functions in Clinical Specialization (3).
- 430 Independent Study (1-3).
- 432 The Family With Long-Term Health Deviations (3).
- 433 The Childbearing Family (2).
- 434 The Family with Short-Term Health Deviations (3).
- 436 Clinical Practicum and Role Development II (3).
- 437 Clinical Practicum and Role Development III (2).
- 439 Family Practice Nursing Preceptorship Practicum (6).
- 440 Concepts of Adult Nursing (3).
- 441 Advanced Physiological Bases for Nursing Practice (3).
- 442 Clinical Specialization in Adult Nursing (6).
- 443 Preparation for Advanced Cancer Nursing (3).
- 450 Research (1-6).
- 452 Community Mental Health Nursing I (4).
- 454 Nursing in Psychosocial Crises (4).
- 456 Mental Health Nurse Clinician (4).
- 457 Nursing Practicum With the Chronically Mentally Ill (4).
- 461 Nursing Administration (3).
- 462 Nursing Administration Practicum (3).
- 463 Practicum in Clinical Specialization in Child Health Nursing (3).
- 490 Research in Nursing (1-6).

NUTRITION

- 300 Problems (1-6).
- 308 Poultry Feeding and Nutrition (3).
- 335 Nutrition During the Life Cycle (3).
- 339 Medical Dietetics (3-12).
- 402 Animal Nutrition (3).
- 406 Comparative Nutrition and Metabolism (2).
- 410 Seminar (1).
- 432 Ruminant Nutrition (3).
- 440 Bioenergetics (3).
- 450 Investigations in Experimental Nutrition (1-6).
- 465 Advanced Metabolism: Amino Acids (2).
- 490 Research (cr. arr.)

OCCUPATIONAL THERAPY

- 200 Occupational Therapy Theory I (5).
- 201 Occupational Therapy Theory II (4).
- 210OT Sensorimotor Development and the Self (3).
- 202 Occupational Therapy Theory III (3).
- 230OT Developmental Adaptation (3).
- 205 Psychological Aspects of Physical Dysfunction (2).
- 210 Therapeutic Media (3).
- 211 Group Process (2).
- 220 Human Anatomy (7).
- 233OT Clinical Pathophysiology I (3).
- 234OT Clinical Pathophysiology II (3).
- 241OT Field Work Experience Level I (2).
- 242OT Field Work Experience Level I (1.5).
- 243OT Field Work Experience Level I (1.5).
- 230 Clinical Kinesiology (3).
- 272OT Physical Dysfunction I (3).
- 273OT Physical Dysfunction II (3).
- 304OT Psychosocial Dysfunction (3).

- 310OT Advanced Therapeutic Media (3).
- 315OT Organization & Administration (2).
- 331 Psychopathology (3).
- 351OT Field Work Experience II (1.2).
- 352OT Field Work Experience - Developmental Dysfunction (6).
- 353OT Field Work Experience - Physical Dysfunction (6).
- 354OT Field Work Experience - Psychosocial Dysfunction (6).

PATHOLOGY

- 200 Basic Pathology (2).
- 210M General and Clinical Pathology, Second Year (8).
- 212M Systemic and Clinical Pathology, Second Year (8).
- 251 Interpretations of Lab Procedures in Primary Health Care (1).
- 310 General Pathology (5).
- 311 General Pathology Laboratory (3).
- 312 Advanced Pathology (5).
- 313 Advanced Pathology Laboratory (3).
- 404 Advanced Pathology (cr. arr.)
- 430 Comparative Pathology (3).
- 491 Research (cr. arr.)

PEACE STUDIES

- 215 Collective Behavior (3).
- 254 Political Sociology (3).
- 260 Economic Development (3).
- 261 The Third World: an Anthropological Perspective (3).
- 300 Mass Media and Society (2).
- 302 International Journalism (2).
- 303 Politics and War (3).
- 322 Philosophy of Behavioral and Social Sciences (3).
- 326 Political Anthropology (3).
- 340 Internship in Peace Studies (1-6).
- 341 Sino-Soviet Conflict (3).
- 355 Western Europe's Foreign Policy (3).
- 370 Political Development and Social Change (3).
- 371 American Foreign Policy from Colonial Times to 1898 (3).
- 373 History of United States Foreign Relations, 1898 to Present (3).

PEST MANAGEMENT

- 209 Weed-crop Ecology (3).
- 305 Introduction to Plant Pathology (3).
- 309 Herbicides in Agronomic Habitats (3).
- 310 Nematology (3).
- 370 Advances in Insect Pest Management (3).
- 391 Plant Pathology Field Survey (2).
- 392 Clinical Plant Pathology fall (1).
- 393 Clinical Plant Pathology (1).

PHARMACOLOGY

- 204 Elements of Pharmacology (3).
- 305 Topics in Pharmacology (cr. arr.)
- 320 Pharmacology (8).
- 328 Principles of Toxicology (3).
- 330 Introduction to General Pharmacology (2).
- 331 Principles of Drug Action I (2).
- 332 Principles of Drug Action II (2).
- 334 History of Pharmacology (1).
- 400 Problems (cr. arr.)
- 410 Seminar (1).
- 427 Fate of Drugs in the Animal Body (2).
- 438 Neuropharmacology (3).
- 450 Research (cr. arr.)
- 490 Research (cr. arr.)

PHILOSOPHY

- 202 Medieval Philosophy (3).
- 204 Ancient Western Philosophy (3).
- 205 Early Modern Philosophy (3).
- 206 Kant to Hegel (3).
- 207 19th Century Philosophy (3).
- 208 Contemporary Philosophy (3).
- 210 Philosophical Ideas in Literature (3).
- 212 Existentialism (3).
- 213 Political and Social Philosophy (3).
- 214 Ethical Issues in Business (3).
- 220 Comparative Feminist Ideologies (3).
- 230 Philosophy and Intellectual Revolution (3).
- 235 Philosophy and Language (3).
- 298 Honors I (3).
- 299 Honors II (3).
- 301 Topics (cr. arr.)
- 303 Selected Modern Philosophers (3).
- 304 Selected Contemporary Philosophers (3).
- 314 Symbolic Logic (3).
- 316 Intermediate Logic (3).
- 317 Aesthetics (3).
- 318 Advanced Symbolic Logic (3).
- 320 Philosophy of Science (3).
- 322 Philosophy of Behavioral and Social Science (3).
- 323 Philosophy of History (3).
- 328 Philosophy of Mind (3).
- 330 Logical Theory (3).
- 331 Medical Ethics (3).
- 332 Philosophy of Law (3).

335 Philosophy and Language (3).
 340 Latin American Philosophy (3).
 341 Marxism (3).
 350 Special Readings (1-3).
 362 Philosophy of India (3).
 364 Contemporary Indian Philosophy (3).
 366 Theories of Ethics (3).
 405 Teaching of Philosophy (1).
 410 Seminar (3).
 411 Ethical Theory (3).
 415 Metaphysics (3).
 418 Epistemology (3).
 421 Plato (3).
 423 Aristotle (3).
 430 The Rationalists (3).
 435 The Empiricists (3).
 436 Kant (3).
 441 Hegel (3).
 449 Marxism (3).
 450 Research (cr. arr.)
 452 Medieval Thinkers (3).
 454 Nineteenth Century Thinkers (3).
 456 Whitehead (3).
 457 Russell and Wittgenstein (3).
 458 Heidegger (3).
 459 Sartre (2-3).
 460 Recent Anglo-American Philosophy (3).
 461 Recent Continental Philosophy (3).
 470 Phenomenology (3).
 471 Aesthetics (3).
 472 Political Philosophy (3).
 473 Philosophy of Science (3).
 474 Seminar in Logic (3).
 475 Indian Philosophy (3).
 476 Human Action (3).
 490 Research (cr. arr.)

PHYSICAL EDUCATION- PROFESSIONAL EDUCATION COURSES

H102 Coaching of Volleyball (2).
 H122 Movement and Its Rhythmic Structure (2).
 H124 Dance for Elementary Schools (2).
 H127 Physical Education Activities for the Elementary School (2).
 H146 Recreational Shooting Sports Instructor (2).
 H147 Fundamentals of Outdoor Education (3).
 H152 Principles of Physical Education (2).
 H157 Sports Officiating (2).
 H158 Sports Officiating (2).
 H161 Aiding: Elementary Schools (1-4).
 H162 Advanced Recreational Dance (2).
 H164 Aiding: Secondary Schools (1-4).
 H170 Psychological and Sociological Perspectives of Sports (2).
 H185 Basic Driver Education (3).
 H186 Advanced Driver Education (2).
 H187 Introduction to Safety Education (2).
 H201 Prevention and Care of Athletic Injury (2).
 H202 Coach of Volleyball (2).
 H203 Coaching of Individual and Dual Sports (2).
 H204 Coach of Baseball and Softball (2).
 H205 Coaching of Basketball (2).
 H206 Coaching of Football (2).
 H207 Coaching of Track and Field (2).
 H227 Physical Education Activities for the Elementary School (2).
 H240 Introduction to Tests and Measurements in Physical Education (2).
 H260 Field Experience in Health and Physical Education (1-8).
 H270 Teaching of Health (3).
 H271 Teaching of Gymnastics (2).
 H272 Teaching of Individual and Dual Sports (2).
 H273 Teaching of Team Sports (2).
 H274 Teaching of Modern Dance (1).
 H275 Teaching of Physical Education (2).
 H279 Organization and Administration of Physical Education Programs (2).
 H299 Student Teaching in Health and/or Physical Education (cr. arr.)
 H300 Problems (1-3).
 H320 Administration of Interscholar Athletics (3).
 H321 Health Education in the Elementary School (3).
 H326 Motor Development in Early Childhood (3).
 H327 Elementary School Physical Education (3).
 H328 Theory of Modern Dance (2).
 H331 Dance and Rhythmic Activities for Teachers of the Handicapped (2).
 H332 Aquatic Activities for Teachers of the Handicapped (1).
 H335 Philosophy of the Dance (2).
 H336 Advanced Rhythmic Structure and Dance Accompaniment (2).
 H337 Dance Composition and Production (3).
 H338 Perceptual-Motor Development and the Severely Handicapped Child (3).
 H347 Outdoor Education Programs (3).
 H349 Practicum in Outdoor Education (1-2).
 H360 Topics in Health and Physical Education (1-3).
 H361 Education in Human Sexuality (3).
 H365 The School Curriculum in Physical Education (2).

H366 Intramural Sports (2).
 H380 Kinesiology (3).
 H381 Theory and Practice of Remedial Gymnastics (2).
 H382 Adapted Physical Education (2-3).
 H383 Developmental Physical Activity (3).
 H384 Movement Education and Recreation for the Handicapped (2-3).
 H385 Physiology of Exercise (3).
 H391 Organization and Administration of Health Education Programs (3).
 H396 Drug Education (3).
 H400 Problems (1-6).
 H407 Tests and Measurements in Physical Education (3).
 H409 Administration of Physical Education (3).
 H410 Seminar in Physical Education (1-3).
 H440 Scientific Studies in Physical Education (3).
 H444 Professional Literature in Physical Education (3).
 H450 Individual Research (1-3).
 H480 Mechanical Analysis of Motor Skills (3).
 H482 Practicum in Adapted Physical Education (2-6).
 H485 Advanced Exercise Physiology (3).
 H490 Research in Physical Education (cr. arr.)

PHYSICAL THERAPY

202PT Human Anatomy (7).
 203 Therapeutic Exercise I (3).
 203PT Therapeutic Exercise I (3).
 204PT Therapeutic Exercise II (4).
 213PT Theory and Technique of Physical Therapy I (3).
 214PT Theory and Technique of Physical Therapy II (4).
 223PT Clinical Education I (1).
 224PT Clinical Education II (1).
 233PT Clinical Pathophysiology I (3).
 234PT Clinical Pathophysiology II (3).
 243PT Applied Neurophysiology for Allied Health Students (3).
 244PT Clinical Kinesiology (4).
 300PT Problems in Physical Therapy (1-3).
 303PT Current Issues in Physical Therapy (4).
 306PT Therapeutic Exercise III (5).
 316PT Approaches to Long Term Care (5).
 325PT Clinical Education III (3).
 326PT Clinical Education IV (1).
 327PT Clinical Externship I (5).
 337PT Clinical Externship II (5).
 347PT Clinical Externship III (5).

PHYSICS

201 Introduction to Modern Astrophysics (3).
 202 Astronomical Observations and Measurements (2).
 215 Intermediate Modern Physics (3).
 225 Fundamentals of Physics for High School Teachers I (2).
 226 Fundamentals of Physics for High School Teachers II (2).
 296 Honors Problems in Physics (cr. arr.)
 300 Problems (cr. arr.)
 304 Principles of Physical Measurements (3).
 305 Electronic Data Processing (4).
 306 Advanced Physics Laboratory I (3).
 307 Advanced Physics Laboratory II (3).
 310 Electricity and Magnetism I (3).
 311 Light and Modern Optics (4).
 312 Introduction to Thermodynamics (3).
 313 Electricity and Magnetism II (3).
 314 Mechanics (3).
 315 Solar System Astrophysics (3).
 320 Observational Astronomy (3).
 325 Stellar Astrophysics (3).
 335 Galactic Astronomy (3).
 340 Extragalactic Astronomy (3).
 370 Introduction to Methods in Mathematical Physics (3).
 375 Computational Methods in Physics (3).
 380 Modern Physics I (3).
 381 Modern Physics II (3).
 385 Introduction to Quantum Mechanics (3).
 400 Problems (cr. arr.)
 404 Study of Techniques of Teaching College Physics (1-3).
 411 Seminar in Solid State Physics (1).
 414 Seminar in Theoretical Physics (1).
 415 Electronic Structure of Solids I (3).
 416 Electronic Structure of Solids II (3).
 420 Nuclear Physics I (3).
 421 Nuclear Physics II (3).
 425 Small-Angle Scattering of X-rays (1-3).
 432 Topics in Astronomy and Astrophysics (3).
 440 Low Energy Neutron Scattering (3).
 445 Plasma Physics (3).
 450 Research (cr. arr.)
 452 Stellar Interiors (3).
 455 Stellar Atmospheres (3).
 461 Dynamics (3).
 462 Electromagnetic Theory (3).
 464 Electrodynamics (3).
 466 Methods in Mathematical Physics (3).
 468 Thermodynamics and Statistical Mechanics (3).
 471 Quantum Mechanics I (3).
 472 Quantum Mechanics II (3).
 473 Quantum Mechanics III (3).
 478 Topics in Solid State Theory (3).
 486 Theory of Elementary Particles (3).
 490 Research (cr. arr.)

ASTRONOMY

201 Introduction to Modern Astrophysics (3).
 202 Astronomical Observations and Measurements (2).
 300 Problems (cr. arr.)
 315 Solar System Astrophysics (3).
 320 Observational Astronomy (3).
 325 Stellar Astrophysics (3).
 335 Galactic Astronomy (3).
 340 Extragalactic Astronomy (3).
 432 Topics in Astronomy and Astrophysics (3).
 452 Stellar Interiors (3).
 455 Stellar Atmospheres (3).

PHYSIOLOGY

201 Elements of Physiology (5).
 208 Human Physiology (3).
 240M Neurosciences I (5).
 250 Medical Physiology (7).
 305 Mammalian Physiology (6-10).
 325 Medical Neurophysiology (3).
 400 Problems (cr. arr.)
 410 Seminar (1).
 418 Advanced Mammalian Physiology (3).
 420 Mammalian Membrane Physiology (3).
 425 Advanced Systems Neurophysiology (3).
 430 Cardiovascular Physiology (3).
 439 Renal Physiology (2).
 450 Research (cr. arr.)
 490 Research (cr. arr.)

PLANT PATHOLOGY

205 Forest Pathology (3).
 305 Introduction to Plant Pathology (3).
 307 Mycology (4).
 310 Nematology (3).
 322 Diseases of Field Crops (2).
 323 Diseases of Ornamentals and Turf (2).
 361 Insects in Relation to Plant Diseases (3).
 369 Genetics of Plant Disease Development (3).
 391 Plant Pathology Field Survey (2).
 400 Problems (cr. arr.)
 401 Topics (cr. arr.)
 405 Plant Virology (2).
 406 Plant Bacteriology (2).
 409 Genera Fungi Imperfecti (3).
 410 Seminar (1).
 411 Biochemistry and Physiology of Plant Diseases (3).
 412 Experimental Plant Disease Physiology (4).
 416 Transport and Metabolism of Plant Nutrients (3).
 450 Research (cr. arr.)
 451 Electron Microscopy (1).
 452 Transmission Electron Microscopy Laboratory (4).
 453 Scanning Electron Microscopy Laboratory (3).
 490 Research (cr. arr.)

POLITICAL SCIENCE

201 Topics (1-3).
 210 Current Issues in American Politics (3).
 260 Themes in Political Theory (3).
 262 Classical Political Thought (3).
 263 Modern Political Thought (3).
 290 Proseminar in Political Science (1-3).
 298 Honors (1-6).
 300 Special Problems (cr. arr.)
 301 Topics (1-99).
 303 Politics and War (3).
 305 Political Parties (3).
 306 Municipal Government (3).
 307 Political Campaigns and Voter Behavior (3).
 308 Comparative Urban Politics (3).
 310 Introduction to Public Administration (3).
 311 Administrative Regulation of Business (3).
 312 Issues in Public Bureaucracy (3).
 314 American Foreign Policies (3).
 315 County and Metropolitan Government (3).
 316 Congress and Legislative Policy (3).
 317 Public Policy (3).
 318 Comparative State Politics (3).
 319 Policy Analysis (3).
 320 The American Constitution (3).
 321 The Constitution and Civil Rights (3).
 322 The United States Supreme Court (3).
 323 Law and the Political Process (3).
 324 Survey Research Methods (3).
 325 Politics of Pressure Groups (3).
 326 Data Analysis in Political Research (3).
 328 Political Behavior (3).
 330 Government Budgeting (3).
 332 Administrative Agency Internship (3-6).
 333 Legislative Internship (3-6).
 334 Campaign Internship (3-6).
 335 Lobbying Internship (3-6).
 336 Special Internship (3-6).
 340 The American Presidency (3).
 350 Special Readings (cr. arr.)
 351 Latin American Governments (3).
 352 The Modern Welfare State (3).
 354 Western European Political Systems (3).
 355 Western Europe's Foreign Policy (3).
 356 Comparative Communist Systems (3).
 358 Soviet Foreign Policy (3).

360 American Political Thought (3).
 361 Recent Democratic Theory (3).
 364 Contemporary Political Theory (3).
 370 Political Development and Social Change (3).
 371 Government and Politics in Southeast Asia (3).
 372 International Relations in Asia (3).
 374 Contemporary South Asian Political Systems (3).
 375 The Politics of Modernization: East Asia (3).
 376 Contemporary Chinese Politics (3).
 385 International Organization (3).
 400 Problems (cr. arr.)
 401 Topics (cr. arr.)
 402 Readings in International Relations (3).
 403 Public Administration and Policy Development (3).
 404 Seminar in International Politics (3).
 405 Readings in American Political Parties (3).
 406 Research in American Politics and Legislation (3).
 407 Problems in Public Opinion (3).
 410 Readings in Public Administration (3).
 411 Studies in Public Administration (3).
 415 The Urban Community (3).
 418 Federalism and Intergovernmental Relations (3).
 419 Logic of Political Inquiry (3).
 420 Judicial Behavior (3).
 421 Research Design and Analysis I (3).
 422 Research Design and Analysis II (0).
 425 Seminar in Constitutional Law (3).
 430 Seminar in Public Policy (3).
 431 Policy Evaluation Methods (3).
 433 Theories of Decision Making (3).
 434 The Individual and the Work Group (3).
 450 Research (cr. arr.)
 452 Public Policies in Advanced Industrial Societies (3).
 456 Seminar in Comparative Politics (3).
 459 Problems in Comparative Politics (3).
 460 Early Political Thought (3).
 461 Modern Political Thought (3).
 462 Contemporary Political Thought (3).
 463 Studies in Political Thought (3).
 465 Normative Political Theory (3).
 472 Political Economy of Rural Development in the Third World (3).
 475 Seminar in East Asian Politics (3).
 480 Independent Readings for Ph.D. Comprehensive Examinations (1-6).
 490 Research (cr. arr.)

PORTUGUESE

201 Topics (cr. arr.)
 206 Advanced Portuguese Composition and Conversation (3).
 207 Intensive Beginning Portuguese (3).
 209 Advanced Portuguese Conversation (3).
 311 Survey of Portuguese Literature (3).
 331 Survey of Brazilian Literature (3).
 350 Special Readings (1-3).
 353 Readings in Portuguese (2-3).
 400 Problems (cr. arr.)

PRACTICAL ARTS AND VOCATIONAL-TECHNICAL EDUCATION

F175 Directed Occupational Experience (1-4).
 F299 Student Teaching in PAVTE (6-8).
 F300 Problems (cr. arr.)
 F321 Vocational Guidance (2-3).
 F325 Field Study in Occupational Education (1-4).
 F360 Topics in Practical Arts and Vocational-Technical Education (cr. arr.)
 F365 Occupational Analysis (2).
 F371 Vocational Education for Handicapped Students (3).
 F372 Methods in Vocational Education for Handicapped Students (3).
 F400 Problems (cr. arr.)
 F406 Foundations/Program Development in Adult Vocational Education (3).
 F410 Seminar in Practical Arts and Vocational-Technical Education (0.5-2).
 F411 Philosophy of the Practical Arts and Vocational Education (3).
 F415 Occupational Surveys (3).
 F451 Measurement and Evaluation in Vocational Education (2-4).
 F459 Administration and Supervision of Vocational Education (2-3).
 F460 Topics (cr. arr.)
 F490 Research (cr. arr.)
AGRICULTURAL EDUCATION
 F100 Foundations of Agricultural Education (1-3).
 F164 Field Experiences in Agriculture Education (1-4).
 F175 Directed Occupational Experience (1-4).
 F299 Student Teaching in Agricultural Education (6-8).
 F300 Problems (cr. arr.)
 F303 The Teaching of Agriculture (3).
 F304 Programs for Out-of-School Groups in Agriculture (2).
 F305 Programs and Instructional Materials in Agriculture (2).
 F306 Teaching Agricultural Mechanics (3).
 F307 Teaching of Agricultural Management (2).
 F310 Agriculture in the Community Schools (2-4).
 F325 Field Study in Occupational Education (1-4).
 F360 Topics (cr. arr.)

F400 Problems (cr. arr.)
 F408 Seminar in Agricultural Education (1-3).
 F420 Advanced Methods of Teaching Agricultural Mechanics (2-4).
 F440 Planning Programs of Supervised Experience in Agr Occupations (2-4).
 F444 Adult Education in Agriculture (2).
 F450 Methods of Teaching Agricultural Management (2-4).
 F460 Topics (cr. arr.)
 F470 In-Service Course in Agricultural Education (cr. arr.)
 F490 Research (cr. arr.)

BUSINESS EDUCATION

F100 Foundations (1-3).
 F137 Business Communications (2).
 F138 Touch Shorthand (3).
 F139 Secretarial Office Procedures and Administration (3).
 F142 Filing Systems and Records Management (2).
 F150 Special Readings in Business Education (1-3).
 F164 Field Experiences in Business Education (1-4).
 F175 Directed Occupational Experience (1-4).
 F251 Teaching Basic Business Subjects (2).
 F252 Teaching Business Skills Subjects (2).
 F299 Student Teaching in Business Education (6-8).
 F300 Problems (cr. arr.)
 F325 Field Study in Occupational Education (1-4).
 F360 Topics (cr. arr.)
 F400 Problems (cr. arr.)
 F409 Principles of Business Education (3).
 F414 Seminar in Business Education (1-3).
 F421 Improvement of Instruction in Basic Business Subjects (3).
 F422 Improvement of Instruction in Business Skills Subjects (3).
 F460 Topics (cr. arr.)
 F474 In-Service Course in Business Education (cr. arr.)
 F490 Research (cr. arr.)

HOME ECONOMICS EDUCATION

F100 Foundations (1-3).
 F164 Field Experiences in Home Economics Education (1-4).
 F175 Directed Occupational Experience (1-4).
 F235 Organization of Vocational Home Economics (2).
 F275 Occupational Home Economics Programs (2).
 F280 Methods of Teaching Vocational Consumer-Homemaking (3).
 F299 Student Teaching in Home Economics Education (6-8).
 F300 Problems (cr. arr.)
 F315 Current Developments in Home Economics Education (3).
 F325 Field Study in Occupational Education (1-4).
 F360 Topics in Practical Arts & Vocational-Technical Education (cr. arr.)
 F376 Homemaking Education for Adults (2-3).
 F400 Problems (cr. arr.)
 F413 Seminar in Home Economics Education (1-3).
 F430 Supervision of Student Teaching of Vocational Home Economics (2-3).
 F446 Curriculum Construction in Home Economics (2-3).
 F460 Topics (cr. arr.)
 F472 In-Service Course in Home Economics Education (cr. arr.)
 F473 Trends in Home Economics Education (3).
 F482 Review and Synthesis of Research in Home Economics Education (3).
 F490 Research (cr. arr.)

INDUSTRIAL EDUCATION

F100 Foundations (1-3).
 F101 Industrial Arts for Elementary Teachers (3).
 F112 Introduction to Metals Processing (3).
 F154 Energy & Power Technology (3).
 F155 Electricity/Electronics (3).
 F164 Field Experiences in Industrial Education (1-4).
 F175 Directed Occupational Experience (1-4).
 F221 Machine Woodworking (2-3).
 F254 Power Technology (3).
 F256 Alternate Energy Technology (3).
 F299 Student Teaching in Industrial Education (6-8).
 F300 Problems (cr. arr.)
 F325 Field Study in Occupational Education (1-4).
 F331 Technology of Woodworking (2-3).
 F341 Metals Processing Technology (2-3).
 F350 Industrial Design (3).
 F355 Applied Electronics (3).
 F360 Topics in Practical Arts and Vocational-Technical Education (cr. arr.)
 F361 Architectural Drawing and Home Design (3).
 F375 Selection and Organization of Subject Matter (3).
 F385 Manufacturing Processes (2-3).
 F390 Principles of Teaching Industrial Subjects (2-3).
 F400 Problems (cr. arr.)
 F404 History of Industrial Education (2).
 F412 Seminar in Industrial Education (1-3).
 F460 Topics (cr. arr.)
 F471 In-Service Course in Industrial Education (cr. arr.)
 F490 Research (cr. arr.)
MARKETING EDUCATION
 F100 Foundations of Distributive Education (1-3).
 F124 Merchandising (3).
 F125 Merchandising (3).
 F164 Field Experiences in Distributive Education (1-4).
 F175 Directed Occupational Experience (1-4).
 F195 Practicum in Vocational Education (1-3).
 F299 Student Teaching in Distributive Education (6-8).

F300 Problems (cr. arr.)
 F308 Coordination of Cooperative Occupational Education (1-4).
 F325 Field Study in Occupational Education (1-4).
 F360 Topics in Practical Arts and Vocational-Technical Education (cr. arr.)
 F397 Curriculum Construction in Marketing and Distributive Education (3).
 F398 Principles of Teaching Distributive Education (3).
 F400 Problems (cr. arr.)
 F460 Topics (cr. arr.)
 F475 In-Service Course in Distributive Education (cr. arr.)
 F490 Research (cr. arr.)

PSYCHIATRY

401 Topics in Psychiatry (cr. arr.)

PSYCHOLOGY

200 Special Problems (cr. arr.)
 205 Environmental Psychology (3).
 211 Theories of Learning (3).
 212 Human Learning (3).
 215 Research Methods in Psychology (3).
 216 Advanced Experimental Psychology (3).
 230 Individual Differences (2).
 260 Social Psychology (3).
 280 Psychology of Personality (3).
 291 Honors Proseminar (3).
 294 Honors Proseminar (3).
 300 Special Problems (cr. arr.)
 301 Topics (cr. arr.)
 302 Theories of Personality (3).
 304 Industrial Psychology (3).
 313 Physiological Psychology (3).
 316 Experimental Approaches to Personality (3).
 320 Infant Development (3).
 321 Ethology and Human Behavior (3).
 330 Animal Behavior (3).
 342 Social Motivation (3).
 343 Advanced Social Psychology (3).
 344 Group Dynamics and Role Theory (3).
 345 Advanced Abnormal Psychology (3).
 346 Structure of Interpersonal Behavior (3).
 347 Emotional Disorders in Infancy and Childhood (3).
 350 Special Readings (cr. arr.)
 360 Systematic Psychology (3).
 361 The History of Psychology (3).
 365 Introduction to Clinical Psychology (3).
 369 Advanced Physiological Psychology (3).
 371 Attitude Change (3).
 376 Psychological Tests and Measurements (3).
 378 Animal Learning Laboratory (5).
 379 Human Learning Laboratory (5).
 380 The Human Senses (3).
 385 Experimental Social Psychology (3).
 386 Methods in Developmental Psychology (3).
 387 Psychology of Aging (3).
 388 Personality and Adjustment in Later Adulthood (3).
 393 Perception (3).
 394 Cognitive Psychology (3).
 399 Motivation (3).
 400 Problems (cr. arr.)
 401 Topics (cr. arr.)
 402 Functional Neuroscience (3).
 405 Survey of Social Psychology (3).
 406 Psychology of Development (3).
 407 Psychopathology of Childhood (3).
 408 Behavior Disorders (3).
 409 Experimental Psychopathology (3).
 410 Field Practice and Orientation to Psychology (1).
 411 Studies in Professional Problems (2-3).
 412 Orientations to Clinical Psychology (3).
 414 Orientations to Clinical Assessment (3).
 415 Test Theory and Development (3).
 416 Studies in Personality (cr. arr.)
 417 Objective Personality Appraisal (3).
 418 Studies in Clinical Psychology (cr. arr.)
 419 Advanced Psychological Statistics I (3).
 420 Advanced Psychological Statistics II (3).
 421 Advanced Techniques in Psychological Statistics (3).
 422 Studies in Learning (cr. arr.)
 424 Studies in Physiological Psychology (cr. arr.)
 425 Orientations in Psychotherapy (3).
 426 Studies in Comparative Psychology (cr. arr.)
 427 Studies in Visual Perception (cr. arr.)
 428 Studies in Psycholinguistics (3).
 429 Advanced Theories of Learning (3).
 430 Studies in Contemporary Psychological Theory (cr. arr.)
 431 Psychoanalytic Theory (2).
 432 Medical Orientation for Clinical Psychologists (2).
 433 Seminar in Social Psychology I (3).
 434 Seminar in Social Psychology II (3).
 437 Studies in Developmental Psychology (cr. arr.)
 439 Human Sexuality for Psychotherapists (3).
 440 Use of Computers in Psychology (3).
 441 Behavior Modifications (2).
 442 Community Psychology (3).
 443 Studies in Social Psychology (cr. arr.)
 445 Clinical Practicum (cr. arr.)
 446 Clinical Child Assessment (3).
 447 Clinical Intervention with Children (3).
 448 Counseling Practicum (cr. arr.)

- 449 Structured Groups (3).
- 450 Research (cr. arr.)
- 454 Psychopharmacology for Psychologists (3).
- 456 Conceptual Approaches to Personality (3).
- 458 Social Learning: Theory and Research (3).
- 460 Verbal Learning (3).
- 462 Family and Group Process (3).
- 463 Animal behavior Analysis and Principles of Behavior Modification (3).
- 470 Social Interaction Research (3).
- 485 Social Psychology Methodology (3).
- 486 Applied Research Methodology (3).
- 487 Methods and Findings in Counseling Process and Outcome Research (3).
- 490 Research (cr. arr.)

PUBLIC ADMINISTRATION

- 201 Topics (3).
- 205 Managing the Public Sector (3).
- 300 Problems (cr. arr.)
- 354 Public Budgeting (3).
- 371 Business, Society, and Government (3).
- 400 Problems (cr. arr.)
- 401 Career Development In Public Organizations (3).
- 402 Research Methods in Public Affairs (3).
- 403 Topics (3).
- 407 Government Accounting for Non-Accounting Majors (3).
- 451 Action Skills In Public Organizations (3).
- 452 National and Subnational Policy Processes (3).
- 453 Public Policy Analysis (3).
- 454 Public Budgeting and Taxation (3).
- 455 Public Financial Administration (3).
- 456 Program Review and Evaluation (3).
- 457 Public Personnel Administration (3).
- 459 Seminar in Public Financial Management (3).
- 460 Planning for Manpower Programs (3).
- 465 Organizational Change & Development In the Public Sector (3).
- 470 Urban Management and Service Delivery (3).
- 471 Management and Organization of State Government (3).
- 473 Productivity Improvement in the Public Sector (3).
- 480 Public Administration Internship (1-6).

RADIOLOGIC SCIENCES

- 250NM Orientation to Nuclear Medicine Technology (1).
- 251RS Radiologic Anatomy and Physiology (5).
- 253RS Principles of Radiographic Exposure I (3).
- 254RS Radiographic Positioning I (2).
- 254RT Radiographic Positioning I (2).
- 255RS Fundamentals of Radiography (2).
- 256NM Clinical Nuclear Medicine I (2).
- 256RS Basic Radiographic Skills (2).
- 260NM Techniques of Saturation Analysis in Nuclear Medicine (3).
- 261RS Radiologic Physics I (3).
- 262RS Advanced Radiographic Procedures (2).
- 263NM Morphological Correlations in Nuclear Medicine (3).
- 263RS Radiographic Positioning II (3).
- 264RS Clinical Education I (2).
- 265NM Clinical Education in Nuclear Medicine in Vivo (5).
- 265RA Clinical Education in Radiation Therapy I (3).
- 265RS Clinical Education II (2).
- 266NM Clinical Education in Nuclear Medicine in Vitro (6).
- 266RA Treatment Planning I (3).
- 267RA Radiation Therapy Physics (5).
- 268NM Clinical Nuclear Medicine II (2).
- 269NM Clinical Nuclear Medicine III (2).
- 300 Problems in Nuclear Medicine Technology (1-3).
- 327 Nuclear Medicine Instrumentation (3).
- 329 Radiopharmaceuticals in Nuclear Medicine (2).
- 371RS Clinical Education III (2).
- 372RS Radiation Hazards and Protection (2).
- 373RS Radiologic Physics II (3).
- 374RA Radium Therapy (2).
- 375RA Radiation Therapy Pathology (2).
- 376RA Clinical Education in Radiation Therapy II (3).
- 377RA Treatment Planning II (2).
- 381RS Clinical Education IV (2).
- 382RT Clinical Education VI (2).
- 383RS Clinical Education VI (2).
- 384RS Teaching Practicum for Allied Health Sciences (3).
- 385RS Clinical Education V (2).

RADIOLOGY

- 201M Radiology (1).
- 227 Radioisotopes in Medicine and Biology (4).
- 328 Introductory Radiation Biology (3).
- 400 Problems in Radiological Science (1-3).
- 410 Seminar (1).

RECREATION AND PARK ADMINISTRATION

- 205 Personnel Management and Leadership in Leisure Services (3).
- 206 Program Development in Leisure Services (3).

- 212 Planning Recreation and Leisure Environments (3).
- 226 Introduction to Leisure & Special Populations (3).
- 230 Introduction to Parks and Outdoor Recreation Services (3).
- 231 Principles of Interpretive Outdoor Recreation (3).
- 289 Recreation and Park Administration Field Experience (12).
- 300 Problems (3).
- 315 Senior Seminar in Leisure Services (3).
- 316 Administration of Leisure Services (3).
- 327 Operation of Therapeutic Recreation: Procedures and Principles (3).
- 328 Leisure and Aging (3).
- 331 Administration of Outdoor Recreation - Education Programs (3).
- 333 Park Management (3).
- 340 Advanced Recreation Land Management (3).
- 342 Principles & Practices of Fund Raising/Evaluation for Hum Srv Org (3).
- 355 Private and Commercial Recreation Principles and Practice (3).
- 356 Systems Analysis of Tourism Services (2).
- 391 Topics in Leisure Studies (1-3).
- 400 Problems (1-6).
- 401 Constructs of Leisure (3).
- 402 Leisure, Technology and Human Values (3).
- 403 Research Methods in Recreation and Park Administration (3).
- 404 Philosophical Perspectives of Leisure (1-3).
- 405 Administration in Leisure Service Delivery (3).
- 406 Financial Operations in Leisure Service Delivery (3).
- 408 Masters Level Comprehensive Examination (1).
- 409 Graduate Enrollment Continuance-Masters Program (1-3).
- 410 Guided Reading in Recreation and Park Administration (1-3).
- 411 Independent Work in Recreation and Park Administration (1-3).
- 412 Topics in Recreation and Park Administration (1-3).
- 419 Masters Level Graduate Seminar (2).
- 426 Analysis of Leisure with Special Populations (3).
- 427 Contemporary Issues in Therapeutic Recreation (3).
- 436 Policy Issues in Outdoors-Resource Based Recreation (3).
- 446 Tourism Development (3).
- 480 Research Project (1-6).
- 481 Field Instruction (1-6).
- 490 Thesis Research (1-6).

RELIGIOUS STUDIES

- 201 Topics (3).
- 202 Early Christianity (3).
- 203 Medieval Christianity (3).
- 204 History of Christianity, 1500-Present (3).
- 213 History of Christian Ethics (3).
- 215 Modern Religious Thought (3).
- 220 Origins of Rabbinic Judaism (3).
- 221 Judaism in Late Antiquity (3).
- 222 Judaism in the Middle Ages through the Enlightenment (3).
- 227 Modern Jewish Thought (3).
- 230 Mythology of South Asia (3).
- 231 Images of Evil (3).
- 233 Key Religious Ideas (3).
- 234 Archaic Religious Life (3).
- 235 Religious Biography (3).
- 237 Area Studies in Religion (3).
- 238 Magic and Occult Religion (3).
- 239 Mysticism (3).
- 240 The Pentateuch (3).
- 241 The Prophets (3).
- 242 The Psalms and Wisdom Literature (3).
- 243 The Gospels of Matthew, Mark, and Luke (3).
- 244 Life and Letters of Paul (3).
- 245 The Gospel and Epistles of John (3).
- 246 Revelation and Apocalyptic Literature (3).
- 248 Biblical Ethics (3).
- 249 Non-Biblical Literature of Early Judaism and Christianity (3).
- 250 Directed Readings in Religion (3).
- 270 Parables (3).
- 271 Religious Themes in Modern Literature (3).
- 273 Religion in Afro-American Literature (3).
- 274 The Modern Short Story and the Crisis of Belief (1-3).
- 290 Honors Seminar in Religion (3).
- 301 Topics (3).
- 302 Major Issues in Christian History (3).
- 312 Major Religious Thinkers (3).
- 331 Studies in History of Religions (3).
- 332 The Vedas (3).
- 342 Non-Canonical Literature of Judaism and Christianity (3).
- 350 Directed Readings in Religion (1-6).

RESPIRATORY THERAPY

- 211RT Equipment and Techniques I (5).
- 213RT Clinical Practice I (3).
- 215RT Normal Respiratory Function (3).
- 222RT Equipment and Techniques II (5).
- 224RT Clinical Practice II (3).
- 226RT Cardiopulmonary Pathology (2).

- 228RT Cardiopulmonary Pharmacology (2).
- 230RS Clinical Practicum (2).
- 230RT Clinical Practicum III (3).
- 331RT Clinical Practice IV (3).
- 333RT Clinical Respiratory Therapy I (3).
- 335RT Respiratory Therapy Aspects of Neonates (2).
- 337RT Introduction to Research (2).
- 340RT Clinical Practice V (3).
- 342RT Clinical Respiratory Therapy II (3).
- 344RT Organization and Administration (3).
- 345RT Teaching Practicum (3).
- 346RT Research (2-6).

ROMANCE LANGUAGES

- 350 Special Readings (1-3).
- 371 Introduction to General Linguistics (3).
- 372 Techniques in Linguistic Analysis (3).
- 373 Linguistic Phonetics (3).
- 374 Issues in Linguistic Analysis (3).
- 400 Problems (cr. arr.)
- 490 Research (cr. arr.)
- 493 Phonology (3).

RURAL SOCIOLOGY

- 201 Organization and Leadership in Modern Society (3).
- 214 The Family (3).
- 216 Urban Sociology (3).
- 225 Social Processes of Communication and Diffusion (3).
- 255 Youth in Today's World (3).
- 270 The Sociology of Religion (3).
- 284 Social Impact Analysis (3).
- 290 Practicum (3).
- 299 Recent Theories in Sociology (3).
- 300 Problems (cr. arr.)
- 301 Topics in Rural Sociology (2-3).
- 305 Social Demography (3).
- 306 Applied Demographic Methods (3).
- 310 Rural Social Organization (3).
- 311 Evaluation and Program Analysis (3).
- 335 Social Change and Trends (3).
- 338 Seminar in Developmental Perspectives and Third World Realities (3).
- 340 Community Social Structure (3).
- 375 Social Statistics (3).
- 376 Advanced Social Statistics (3).
- 400 Problems (cr. arr.)
- 406 Seminar in Social and Economic Development (3).
- 421 Seminar in Population and Human Ecology (3).
- 425 Communication and the Diffusion of Information (3).
- 430 Research Methodology (3).
- 431 Seminar in Multivariate Analysis Techniques (3).
- 432 Seminar in Qualitative Methods in Sociology (3).
- 444 The Social Organization of Agriculture (3).
- 445 Seminar on Issues in the Sociology of Agriculture (3).
- 446 Seminar in Comparative Rural Population (3).
- 447 Seminar on Contemporary Issues in Rural Sociology (cr. arr.)
- 450 Research (cr. arr.)
- 480 Special Topics in Sociological Research Methods (1-3).
- 490 Research (cr. arr.)

RUSSIAN

- 203 Advanced Russian Reading (3).
- 251 Russian Literature from the Beginnings to Turgenev (3).
- 252 Tolstoy and Dostoevsky (3).
- 253 Russian Modernism (3).
- 254 Contemporary Russian Literature (3).
- 275 Russian Classics I (3).
- 276 Russian Classics II (3).
- 301 Topics in Russian (cr. arr.)
- 311 The Russian Realist Novel (3).
- 315 Russian Poetry (3).
- 316 Russian Drama (3).
- 350 Special Readings (1-3).

SOCIAL WORK

- 201 Topics in Social Work (1-3).
- 225 Medical Social Problems (2).
- 300 Problems in Social Work (1-3).
- 301 Topics in Social Work (1-3).
- 303 Social Justice and Social Policy (3).
- 304 Introduction to Community and Organizational Processes (3).
- 306 Introduction to Social Work Practice (3).
- 307 Delinquency and Social Treatment (2).
- 308 Comparative Social Policy (2-3).
- 309 Social Work Practice (3).
- 312 Research Methods for Social Work (3).
- 313 Community and Organization Dynamics (3).
- 314 Evaluative Research in Clinical Social Work Practice (3).
- 315 Dynamics of Interviewing (3).
- 319 Social Statistics (3).
- 320 Social Psychological Perspectives in Human Development for Soc Wk (3).
- 321 Social Deviance (3).
- 323 Behavioral Foundations for Social Work Administration (3).
- 325 Alcoholism: Treatment and Prevention (3).

- 326 Rural Human Services (3).
 327 Women and Health Care (3).
 328 Working with Minority Youth (3).
 330 Interaction Skills Workshop (3).
 345 Ethical Issues in Social Service (3).
 350 Special Readings (1-3).
 360 Strategies of Direct Practice (3).
 361 Strategies of Clinical Social Work Intervention (3).
 363 Fundamentals of Social Work Administration (3).
 370 Law and Social Work Practice (3).
 375 Helping Strategies with Older Persons (3).
 380 Social Work Practice With Minorities: Afro-American Emphasis (3).
 385 Helping Strategies With Children and Adolescents (3).
 390 Interventive Processes I (6).
 391 Interventive Processes II (1-6).
 394 Senior Professional Seminar (3).
 400 Problems (1-6).
 401 Topics in Social Work (1-3).
 402 Advanced Social Policy for Planning and Administration (3).
 405 Social Work Practice in the Health Field (3).
 406 Health Policies and Programs (3).
 407 Social Work Practice in the Family and Child Welfare Field (3).
 408 Family and Child Welfare Policies and Programs (3).
 410 Professional Practice Seminar I (3).
 412 Research Design in Social Work (3).
 413 Evaluative Research in Clinical Social Work Practice (3).
 414 Evaluative Research in Social Work Planning & Administration (3).
 430 Community Organization for Social Welfare (3).
 431 Advanced Social Group Work (3).
 432 Family Treatment (3).
 435 Management of a Social Agency (3).
 440 Supervision, Consultation and Staff Training (3).
 450 Independent Study (1-6).
 481 Professional Development Workshop (8).
 490 Research (1-6).
 491 Professional Leadership Practice (1-13).
 492 Practicum in Cultural Diversity I (1).
 493 Practicum in Cultural Diversity II (1).

SOCIOLOGY

- 200 Class, Status, and Power (3).
 210 Public Opinion and Communication (3).
 211 Criminology (3).
 212 Contemporary Corrections (3).
 214 The Family (3).
 215 Collective Behavior (3).
 216 Urban Sociology (3).
 217 The Sociology of Sport (3).
 219 Organization and Institutions (3).
 236 Social Movements and Conflicts (3).
 252 Occupations and Professions (3).
 254 Political Sociology (3).
 255 Youth in Today's World (3).
 260 Social Psychology (3).
 262 Sociology of Sex Roles (3).
 270 The Sociology of Religion (3).
 282 Senior Seminar (3).
 284 Social Impact Analysis (3).
 290 Practicum (1-9).
 298 The Rise of American Sociology (3).
 299 Recent Theories in Sociology (3).
 301 Topics in Sociology (cr. arr.)
 302 Social Studies of Science (3).
 305 Social Demography (3).
 306 Applied Demographic Methods (3).
 310 Rural Social Organization (3).
 311 Evaluation and Program Analysis (3).
 322 Sociology of Aging (3).
 323 Death and Dying (3).
 324 Sociological Concepts and Health (3).
 325 Sociology of Health Problems (3).
 326 The Sociology of Health Care Systems (3).
 327 Sociology of Health Occupations and Organizations (3).
 333 Social Organization (2-3).
 335 Social Change and Trends (3).
 337 Race and Ethnic Relations (3).
 340 Community Social Structure (3).
 343 Advanced Social Psychology (3).
 344 Group Dynamics and Role Theory (3).
 346 Structure of Interpersonal Behavior (3).
 350 Special Readings (cr. arr.)
 353 Sociology of Education (3).
 369 Comparative Family Study (3).
 371 Attitude Change (3).
 372 Social Organization of the Advanced Societies (3).
 375 Social Statistics (3).
 376 Advanced Social Statistics (3).
 400 Problems (cr. arr.)
 403 Professional Problems (1-3).
 405 Theories of Society (3).
 409 Seminar in State and Economy (3).
 410 Seminar in Comparative Social Institutions (3).
 411 Seminar in Sociology of Work (2).
 412 Seminar in Sociology of Organizations (3).
 415 Seminar in Family Sociology (3).
 420 Independent Readings in Preparation for Comprehensive Examinations (1-6).

- 421 Seminar in Population and Human Ecology (3).
 425 Communication and the Diffusion of Information (3).
 428 Seminar on Race Relations (3).
 429 Seminar in Criminology and Deviant Behavior (3).
 430 Research Methodology (3).
 431 Seminar in Multivariate Analysis Techniques (3).
 432 Seminar in Qualitative Methods in Sociology (3).
 433 Seminar in Social Psychology I (3).
 434 Seminar in Social Psychology II (3).
 438 Seminar in Sociological Theory I (3).
 439 Seminar in Sociological Theory II (3).
 440 Topical Seminar in Contemporary Sociological Theory (3).
 441 Topical Seminar in Historical Sociology (3).
 442 Seminar in Sociological Theory Construction (3).
 450 Research (1-6).
 456 Seminar on the Sociology of Health and Sickness (3).
 458 Practicum in Health Care Research (1-18).
 468 Seminar in Social Gerontology (2-3).
 470 Social Interaction Research (3).
 480 Special Topics in Sociological Research Methods (1-3).
 490 Research (cr. arr.)

SOUTH ASIA STUDIES

- 203 Advanced Hindi Readings I (4).
 204 Advanced Hindi Readings II (4).
 230 Mythology of South Asia (3).
 301 Topics (cr. arr.)
 332 The Vedas (3).
 350 Special Readings in South Asian Languages (1-6).
 362 Philosophy of India (3).
 364 Contemporary Indian Philosophy (3).
 371 Southeast Asia (3).
 372 Geography of South Asia (3).
 374 Contemporary South Asian Political Systems (3).
 384 Religion and Politics in Modern India, 1857-1947 (3).
 400 Problems (3).
 474 Problems of South Asia (3).

SPANISH

- 201 Topics (cr. arr.)
 203 Introduction to Hispanic Literature I (3).
 204 Introduction to Hispanic Literature II (3).
 206 Advanced Spanish Composition (3).
 208 Commercial Spanish (3).
 209 Advanced Spanish Conversation (3).
 211 Intensive Beginning Spanish I (5).
 212 Intensive Beginning Spanish II (5).
 223 Mexican Culture and Civilization (2).
 260 Phonetics (3).
 296 Honors Readings in Spanish (1).
 297 Honors Thesis in Spanish (3).
 301 Topics (cr. arr.)
 309 Spanish Medieval Literature (3).
 310 Renaissance and Golden Age Poetry (3).
 311 Renaissance and Golden Age Prose (3).
 312 Spanish Theatre in the Golden Age (3).
 313 Don Quijote (3).
 317 Spanish Poetry in the Nineteenth and Twentieth Centuries (3).
 318 Nineteenth-Century Spanish Drama (3).
 319 Nineteenth-Century Spanish Novel (3).
 320 Twentieth-Century Spanish Drama (3).
 321 Twentieth-Century Spanish Novel (3).
 323 Advanced Mexican Culture and Civilization (2).
 325 Techniques of Literary Translation (3).
 331 Survey of Spanish American Literature I (3).
 332 Survey of Spanish American Literature II (3).
 335 Mexican Literature (3).
 341 Argentine Literature (3).
 345 Modernista and Contemporary Poetry (3).
 350 Special Readings (1-3).
 353 Readings in Spanish (2-3).
 355 The Spanish American Theatre (3).
 356 Stylistics (3).
 361 History of the Spanish Language (3).
 379 Structure of Modern Spanish (3).
 400 Problems (cr. arr.)
 401 Literary Research in Hispanic Studies (3).
 410 Seminar (2-3).
 412 Studies in Spanish Literature of the Medieval Period (3).
 415 Studies in Spanish Literature of the Renaissance (3).
 416 Studies in Spanish Literature in the Golden Age (3).
 419 Studies in Nineteenth-Century Spanish Literature (3).
 420 Studies in Twentieth-Century Spanish Literature (3).
 425 Techniques of Literary Translation (3).
 430 Studies in Spanish-American Poetry (3).
 431 Studies in Spanish-American Fiction (3).
 433 Studies in the Spanish-American Theatre (3).
 460 Old Spanish--Phonology, Morphology and Syntax (3).
 480 Readings (3-6).
 490 Research (cr. arr.)

SPECIAL EDUCATION

- L150 Special Readings (1-3).
 L160 Field Experiences: Early Childhood Special Education (1-3).
 L162 Field Experiences: Primary Special Education (1-3).
 L163 Field Experiences: Intermediate Special Education (1-3).

- L164 Field Experiences: Secondary Special Education (1-3).
 L299 Student Teaching in Special Education (cr. arr.)
 L321 Introduction to Mental Retardation (3).
 L322 Secondary Methods in Mental Retardation (3).
 L323 Curriculum for Severely Handicapped Students (4).
 L324 Assessment of Functional Skills of Severely Handicapped Students (3).
 L330 Teaching the Mentally Retarded (2).
 L334 Introduction to Severely Handicapped and Multihandicapped (3).
 L335 Managing Health Problems of the Handicapped (3).
 L336 Education of the Multihandicapped (2).
 L337 Methods in Teaching the Gifted and Talented (3).
 L338 Introduction to Education of the Gifted (3).
 L339 Education of Exceptional Students (3).
 L342 Introduction to Learning Disabilities (3).
 L343 Methods in Teaching the Learning Disabled (3).
 L346 Language Development of Exceptional Students (3).
 L351 Introduction to Education of Behaviorally Disordered Students (3).
 L352 Teaching the Behaviorally Disordered (3).
 L360 Topics in Special Education (cr. arr.)
 L361 Psychoeducational Assessment of Exceptional Students (3).
 L362 Psychoeducational Assessment of Exceptional Students-Laboratory (2).
 L363 Behavioral Management with Exceptional Students (3).
 L364 Behavioral Management with Exceptional Students-Laboratory (2).
 L365 Instructional Programming for Exceptional Students (3).
 L366 Instructional Programming for Exceptional Students-Laboratory (2).
 L367 The Use of Instructional Materials With Exceptional Students (3).
 L368 Instructional Materials with Exceptional Students-Laboratory (2).
 L371 Vocational Education for Handicapped Students (3).
 L372 Methods in Vocational Education for the Handicapped (3).
 L381 Introduction to Early Childhood Special Education (3).
 L400 Problems in Special Education (cr. arr.)
 L410 Seminar in Special Education (1-3).
 L415 Practicum in Special Education Area of Handicapped (2-8).
 L420 Trends and Issues in Special Education (3).
 L421 Research With Exceptional Children (3).
 L422 Assessment and Remediation of Learning Disabilities (3).
 L424 Programmatic Approaches to Educ. of Child. with Behav. Disorders (3).
 L425 Psychological and Sociological Aspects of Mental Retardation (3).
 L490 Research in Special Education (cr. arr.)

SPEECH AND DRAMATIC ART

- 205 Performance in the Visual Media (3).
 206 Advanced Audio Production (3).
 210 Introduction to Radio, TV, Film Writing (3).
 220 Technical Theatre Practicum (1).
 233 Oral Interpretation of Literature (3).
 243 Acting I (3).
 244 Acting II (3).
 251 Beginning Theatrical Costume Design (3).
 252 Stagecraft (3).
 253 Scene Painting (2).
 254 Scene Design I (3).
 261 Theatrical Directing (4).
 266 Musical Theatre Performance (3).
 270 Culture and Communication (3).
 273 Communication in Campaigns (3).
 275 Business and Professional Speech Communication (3).
 276 Persuasive Speaking (3).
 283 Contemporary American Speakers (3).
 296 Honors in Speech (2).
 297 Honors in Speech (2).
 301 Topics (cr. arr.)
 302 Experimental Film and Video (3).
 303 Film Production (3).
 304 Media Programming and Management (3).
 305 Television Studio Production (3).
 307 Broadcast Regulation and Responsibility (3).
 308 Television Program Analysis and Criticism (3).
 309 Animated Film (3).
 310 Film and Television Documentary (3).
 311 Beginning Playwriting (3).
 312 Advanced Playwriting (3).
 315 Psychosocial Aspects of Speech (3).
 320 Theatre Practicum (1-3).
 325 Television Field Production (3).
 330 Professional Practicum (6).
 335 Television Technology (3).
 336 Contemporary Issues in Telecommunications (3).
 340 Summer Repertory Theatre (cr. arr.)
 341 Development of American Theatre I (3).
 342 Development of American Theatre II (3).
 343 Studies in Dramatic Theory (3).
 344 Studies in Dramatic Criticism (3).
 347 Acting III (3).
 350 Directed Reading (1-3).

351 Theatre Organization and Management (3).
 352 Scene Design (3).
 353 Advanced Theatrical Costume Design (3).
 354 Stage Lighting Design (3).
 362 Advanced Directing (3).
 363 Development of Dramatic Art I (3).
 364 Development of Dramatic Art II (3).
 365 Theatre Architecture (3).
 367 Theatre History I (3).
 368 Theatre History II (3).
 374 Persuasion (3).
 376 Communication in Organizations (3).
 377 Senior Performance Seminar (1).
 381 Principles of Rhetoric (3).
 382 Process of Speech Communication (3).
 395 Professional Seminar in Television Production (3).
 396 Professional Seminar in Film Production (3).
 400 Problems (cr. arr.)
 401 Topics (cr. arr.)
 402 Theories of Speech Communication (3).
 403 Seminar in Speech Communication (3).
 404 History and Criticism of Broadcasting (3).
 405 Seminar in Film Theory (3).
 406 International Broadcasting (3).
 407 Educational Television (3).
 408 Seminar in Radio-TV-Film (1-6).
 410 Studies in Broadcasting (1-6).
 441 Introduction to Theatre Scholarship (3).
 450 Research (cr. arr.)
 451 Seminar in Speech Education (3).
 460 Seminar in Theatre History (3).
 462 Backgrounds of Modern Theatre Practice (3).
 466 Seminar in Dramatic Theory and Criticism (3).
 483 Seminar in American Rhetoric and Public Address (1-6).
 485 Rhetorical Criticism (3).
 486 Seminar in Theories of Rhetoric and Criticism (1-6).
 487 Philosophic Foundations of Speech (3).
 488 Rhetoric of British Thought (3).
 490 Research (cr. arr.)

STATISTICS

207 Statistical Analysis (3).
 234 Intermediate Statistics (3).
 250 Introduction to Probability and Statistics II (3).
 298 Honors (2).
 299 Honors (2).
 300 Problems (1-3).
 301 Topics (cr. arr.)
 302 Statistical Methods in the Health Sciences (3).
 304 Statistical Computing (3).
 307 Nonparametric Statistical Methods (3).
 320 Introduction to Mathematical Statistics (3).
 325 Introduction to Probability Theory (3).
 326 Statistical Inference I (3).
 328 Introduction to Stochastic Processes (3).
 329 Applied Probability (3).
 360 Industrial Statistics (3).
 370 Sampling Techniques (3).
 375 Operations Research (3).
 380 Statistical Forecasting (3).
 385 Regression and Correlation Analysis (3).
 395 Analysis of Variance (3).
 400 Problems and Special Readings (cr. arr.)
 403 Statistical Inference II (3).
 411 Statistics Seminar (cr. arr.)
 416 Statistical Consulting (3).
 420 Bayesian Statistics (3).
 423 Experimental Design (3).
 430 Life Testing and Reliability (3).
 440 Advanced Probability (3).
 441 Stochastic Processes (3).
 452 Special Topics in Statistics (cr. arr.)
 460 Theory of Estimation and Hypothesis Testing (3).
 461 Advanced Inference (3).
 464 Linear Models I (3).
 465 Linear Models II (3).
 466 Multivariate Analysis (3).
 470 Theory of Nonparametric Statistics (3).
 490 Research (cr. arr.)

VETERINARY BIOMEDICAL SCIENCE

VETERINARY ANATOMY

202V Veterinary Anatomy (8).
 203V Veterinary Anatomy (10).
 219 Elements of Veterinary Anatomy (3).
 303 Cytology, Histology and Microscopic Anatomy of Domestic Animals (5).
 305 Histological and Anatomical Techniques (cr. arr.)
 307 Embryology and Development of Domestic Animals (2).
 311 Canine Dissection (6).
 312 Anatomy of Common Domestic Animals (5).
 409 Advanced Microscopic Anatomy (cr. arr.)
 418 Correlative Neuroanatomy (4).

VETERINARY ANATOMY-PHYSIOLOGY

200 Problems (cr. arr.)
 300 Problems (cr. arr.)
 328 Principles of Toxicology (3).
 400 Problems (cr. arr.)
 410 Seminar (1).
 450 Research (cr. arr.)
 490 Research (cr. arr.)
 WINTER Full-Time Enrollment (cr. arr.)

VETERINARY MEDICINE AND SURGERY

200V Problems (cr. arr.)
 251V Food Animal Medicine and Surgery I (10).
 252V Food Animal Medicine and Surgery II (1-10).
 253V Small Animal Medicine I (10).
 254V Small Animal Medicine II (1-10).
 255V Equine Medicine and Surgery I (10).
 256V Equine Medicine and Surgery II (1-10).
 257V Small Animal Surgery I (10).
 258V Small Animal Surgery II (1-10).
 259V Theriogenology I (10).
 260V Theriogenology II (1-10).
 261V Medical Services I (10).
 262V Medical Services II (1-10).
 265V Laboratory Animal Medicine and Management I (10).
 266V Laboratory Animal Medicine and Management II (1-10).
 267V Herd Health Management and Nutrition I (1-10).
 268V Herd Health Management and Nutrition II (1-10).
 270V Fundamentals of Clinical Medicine (4).
 272V Small Animal Surgery (2,5).
 273V Radiology (2).
 274V Small Animal Medicine (2,5).
 275V Food Animal Medicine and Surgery (3,5).
 276V Laboratory Animal Medicine (1,5).
 278V Equine Medicine and Surgery (2).
 300 Problems (cr. arr.)
 328 Introductory Radiation Biology (3).
 351 Advanced Surgical Techniques (cr. arr.)
 355 Advanced Techniques in Radiology (cr. arr.)
 356 Advanced Studies of Poisonous Plants and Toxicology (cr. arr.)
 400 Problems (cr. arr.)
 401 Topics (1-3).
 410 Seminar (1).
 450 Research (cr. arr.)
 487 Nuclear Medicine (3).
 488 Radiation Therapy (3).
 490 Research (cr. arr.)

VETERINARY MICROBIOLOGY

241V Veterinary Immunology (2).
 242AV Veterinary Bacteriology I (3).
 242BV Veterinary Bacteriology II (2).
 243V Veterinary Virology (3).
 245AV Veterinary Parasitology I (3).
 245BV Veterinary Parasitology II (3).
 246V Introduction to Epidemiology and Infectious Disease (2).
 247V Veterinary Clinical Epidemiology and Preventive Medicine (4).
 269V Public Health and Epidemiology (10).
 270V Epidemiology and Community Health (1-10).
 300 Problems (cr. arr.)
 340 Microbial Physiology (3).
 343 Animal Virology (4).
 345 Veterinary and Human Parasitology (4).
 347 Clinical Epidemiology and Environmental Health (1-10).
 348 Epidemiology of Zoonotic Diseases (1-10).
 410 Seminar (1).
 421 Advanced Epidemiology (3).
 441 Topics in Veterinary Microbiology (1-3).
 442 Advanced Veterinary Pathogenic Bacteriology (3).
 443 Viral Infection and Immunity (3).
 444 Diseases of Laboratory Animals (3).
 445 Advanced Veterinary Parasitology (3).
 446 Cellular Function in Immunity (2).
 447 Oncogenic Animal Viruses (3).
 449 Epidemiology of Zoonoses (3).
 490 Research (cr. arr.)

VETERINARY PATHOLOGY

200 Problems (cr. arr.)
 230 Animal Sanitation and Disease Prevention (3).
 231V General Pathology (3).
 232AV Systemic and Special Pathology I (3).
 232BV Systemic and Special Pathology II (3).
 233V Veterinary Clinical Pathology (3).
 263V Diagnostic Pathology and Special Species Medicine I (10).
 264V Diagnostic Pathology and Special Species Medicine II (1-10).
 300 Problems (cr. arr.)
 335 Techniques in Pathology (cr. arr.)
 410 Seminar (1).
 430 Comparative Pathology (3).
 431 Advanced Veterinary Pathology (3-5).
 432 Advanced Histopathology (5).
 433 Veterinary Oncology (3).

434 Advanced Clinical Pathology (4).
 437 Pathology of Laboratory Animals (3).
 438 Primatology (3).
 450 Research (cr. arr.)
 451 Electron Microscopy (1).
 452 Transmission Electron Microscopy Laboratory (4).
 453 Scanning Electron Microscopy Laboratory (3).
 490 Research (cr. arr.)

VETERINARY PHARMACOLOGY AND TOXICOLOGY

226V Veterinary Pharmacology (3).
 227V Veterinary Pharmacology/Anesthesiology (3).
 228V Veterinary Toxicology (3).
 326 Veterinary Pharmacology (3).
 328 Principles of Toxicology (3).
 427 Fate of Drugs in the Animal Body (2).

VETERINARY PHYSIOLOGY

220V Veterinary Physiology (5).
 221V Veterinary Physiology (6).
 222 Fundamentals of Animal Physiology (3).
 224V Veterinary Physiologic Chemistry (5).
 327 Principles of Physiologic Adaptation (3).
 420 Veterinary Physiology (5).
 421 Veterinary Physiology (5).

WOMEN STUDIES

201 Topics (1-3).
 208 Historical Survey of Women Writers (3).
 215 American Feminism (3).
 220 Comparative Feminist Ideologies (3).
 225 Twentieth Century French Women Writers In Translation (3).
 301 Topics (3).
 308 Major Women Writers (3).
 350 Special Readings (3).
 390 Senior Research Seminar (3).

INDEX

A

Academic Calendar, 96
Accountancy, 21, 85
Adding a course, see Petitioning, 11
Administrative Behavior and Survey
 Research Laboratory, 7
Admission, 13, 15
Adviser, 15, 18
Aerospace Engineering, see Mechanical
 and Aerospace Engineering, 59
Affirmative Action Office, 12
Agricultural Economics, 22, 85
Agricultural Engineering, 22, 85
Agronomy, 23, 85
Anatomy, 24, 85
Ancient Studies Area, 25, 78
Animal Science, 25, 85
Anthropology, 25, 85; Museum, 6
Archaeology, see Art History and
 Archaeology, 27
Application Fee, 9
Area Programs, 78
Art, 26, 86
Art History and Archaeology, 27, 86;
 Museum, 6
Asian Studies, see South Asia Language
 and Area Studies, 83
Assistantships, 12
Astronomy, 97
Atmospheric Science, 28, 86
Auto Registration, 10

B

B&PA Research Programs, 7
Bacteriology, see Microbiology, 81
Biochemistry, 28, 86
Biological Sciences, 29, 87
Black Studies Area, 30, 79
Botany, see Biological Sciences, 29
Business Administration Area, 30, 87

C

Candidacy, 13, 15
Career Planning and Placement, 12
Center for Research in Social Behavior, 7
Chemical Engineering, 32, 87
Chemistry, 32, 87
Child and Family Development, 33, 87
Child Health, 87
Civil Engineering, 33, 87
Classical Studies, 34, 79, 88
Clinical Laboratory Sciences, 88
Clothing and Textiles, 35, 53, 88
Communicative Disorders, 35, 88
Community Development, 36, 88
Community Health Education
 Program, see Family and Community
 Medicine, 45
Comprehensive Examination - PhD, 19

Computer Science, 36, 88
Computing Facilities, 6
Continuous Registration, 18
Correspondence Credit, 15
Courses, 85
Course of Study, 15
Curriculum and Instruction, 36, 89

D

Dairy Science, 37, 89
Dalton Research Center, 7
Disabled Students, 12
Dissertation, 20
Doctoral Committees, 18
Doctoral Degrees, 18
Dramatic Art, see Speech and Dramatic
 Art, 74
Dropping a Course, see Petitioning, 11
Dual Enrollment, 15; for Medical
 Students, 17
Dual Degrees, 17

E

Economics, 37, 89
EdD Regulations, 19
Education, 40, 89
Educational Administration, 41, 89
Educational and Counseling Psychology,
 42, 89
Educational Research and Statistics, 90
Educational Specialist Degree, 17
Electrical Engineering, 42, 90
Electronic Instrument Shop, 8
Engineering, see Agricultural
 Engineering, 22; Chemical Engineering,
 32; Civil Engineering, 33; Electrical
 Engineering, 42; Industrial
 Engineering, 55; Mechanical and
 Aerospace Engineering, 59; Nuclear
 Engineering, 62; Registration, 14
English, 43, 90
Enrollment, 11
Entomology, 45, 91; Museum, 6
Extension Education, 45, 91

F

Family and Community Medicine, 45,
 91
Family Economics and Management,
 46, 91
Family Student Housing, 11
Fees and Expenses, 9-10; Time and
 Method of Payment, 9
Fellowships, 12
Finance, 46, 91
Fields of Study, 21
Financial Aid, 12
Food Science and Nutrition, 46, 91
Foreign Students, see International
 Students, 12

Forestry, Fisheries and Wildlife, 47, 91,
 Collections, 6-7
Freedom of Information Center, 7
French, see Romance Languages, 71, 91
Full-time Employees, 11

G

Genetics Area, 48, 79
Geography, 48, 92
Geology, 49, 92; Museum, 6
Germanic and Slavic Studies, 49, 92
Gerontology, 50, 79
Grading, 14
Graduate Record Examination, 13
Graduate School, 2
Graduate Student Affairs, 12
Graduate Student Association, 12
Graduation (Scholastic Requirements),
 16
Greek, see Classical Studies, 34, 88, 92

H

Health and Physical Education, 50
Health Service, 12
Health Services Management, 50, 92
Health Related Professions, 92
Hearing (Audit) Courses, 11
Herbarium, 6
Hindi, see South Asia Language and
 Area Studies, 74, 83
Higher and Adult Education and
 Foundations, 51, 92
History, 51, 92
Home Economics, 52, 93
Home Economics Communications, 53,
 54, 93
Horticulture, 54, 93
Housing, 9, 11
Housing and Interior Design, 53, 55, 93
Human Nutrition, Foods and Food
 Systems Management, 53, 55, 93

I

Incidental Fee, 9, 10
Independent Study, 15
Industrial Engineering, 55, 93
Indian Languages, see South Asia
 Language and Area Studies, 74, 83
Information Science, 93
Insurance (Health), 12
International Development Area, 56, 80
International Students, 12, 14
Interstate Reciprocity Agreement, 11
Italian, see Romance Languages, 71, 93

J

Journalism, 56, 93

L

Laboratory Animal Medicine Area, 58, 80, 94
 Languages, see Classical Studies, 34;
 Germanic and Slavic Studies, 49;
 Romance Languages, 71; Linguistics
 Area Program, 58
 Late Registration Fee, 9
 Latin, see Classical Studies, 34, 79, 94
 Law, 94
 Libraries, 4
 Library and Informational Science, 58,
 94
 Linguistics Area, 58, 80, 94
 Low Level Radiation Laboratory, 8

M

Management, 58, 94
 Marketing, 58, 95
 Master of Accountancy, 17, 21
 Master of Arts, 16
 Master of Arts in Physical Education,
 16
 Master of Business Administration, 17
 Master's Degree, 15
 Master of Education, 16
 Master of Fine Arts, 17
 Master of Health Sciences, 17
 Master's-MD Program, 15
 Master of Music, 17
 Master of Public Administration, 17
 Master of Science, 16
 Master of Science, Physical Sciences,
 16
 Master of Science for Teachers, 16
 Master of Social work, 17
 MASUA and Inter-UM Traveling Scholars,
 20
 Mathematics, 58, 95
 Matriculation Examination, 20
 Mechanical and Aerospace Engineering,
 59, 95
 Medical Physics, 66, 95
 Medicine, 95
 Medieval and Renaissance Studies Area,
 60, 81
 MD-PhD, 17
 Microbiology, 60, 95
 Microbiology Area, 61, 81
 Military Science, 95
 Minority Students, 12
 Miller Analogies Test, 13
 Minors, 15
 Missouri Cultural Heritage Center, 9
 Museums and Collections, 6
 Music, 61, 95

N

Naval Science, 96
 Nonresident Tuition, 10
 Nuclear Engineering, 62, 96
 Nuclear Reactor, see Research Reactor, 8
 Nursing, 63, 96
 Nutrition Area, 64, 82, 96

O

Occupational Therapy, 96
 Off-campus Housing, 11
 Off-campus Research 15, 18

P

Park Administration, see Recreation
 and Park Administration, 71
 Pathology, 64, 96
 Pathology Area, 64, 78, 82
 Peace Studies, 96
 Pest Management, 96
 Petitioning, 11
 Pharmacology, 64, 96
 PhD Regulations, 19
 Philosophy, 65, 96
 Physical Education, see Education, 40,
 97
 Physical Science Area, 65, 83
 Physical Therapy, 97
 Physics, 66, 97
 Physiology, 66, 97
 Physiology Area, 67, 83
 Plant Microbiology, see Biological
 Sciences, Botany; Microbiology Area,
 29
 Plant Pathology, 67, 97
 Political Science, 68, 97
 Portuguese, see Romance Languages,
 71, 98
 Practical Arts and Vocational-Technical
 Education, 69, 98
 Psychology, 69, 98
 Public Administration, 70, 99
 Public Affairs Information Service, 7
 Public Health, see Family and
 Community Medicine, 45, 91
 Public Relations, see Journalism, 56, 93

Q

Qualifying Examination, Doctoral, 18
 EdD, 20

R

Radio, see Journalism, 56, 93, or Speech
 and Dramatic Art, 74, 100
 Radiologic Sciences, 99
 Recreation and Park Administration, 71,
 99
 Refund of Fees, 10
 Regional Science Area, 71, 83
 Registration, 9, Doctoral, 18
 Regulations, 16, EdD, 19
 Religious Studies, 99
 Research Centers and Resources, 7
 Research Farms, 8
 Research Reactor, 8
 Residence Halls, 11
 Residence Requirements, 15, 18
 Respiratory Therapy, 99
 Romance Languages, 71, 99
 Russian, see Germanic and Slavic
 Studies, 49, 99

S

Sanskrit, see South Asia Language and
 Area Studies, 74, 83
 Scholar, 20
 Scholarships, 12
 Scholastic Requirements, 14
 Science Instrument Shop, 8
 Sinclair Research Farm, 8
 Slavic Languages, see Germanic and
 Slavic Studies, 49
 Social Work, 72, 99
 Sociology and Rural Sociology, 73, 99,
 100
 South Asia Language and Area Studies,
 74, 83, 100
 Spanish, see Romance Languages, 71, 99
 Special Education, 74, 100
 Special Enrollment Categories, 13
 Speech and Dramatic Art, 74, 100
 Statement of Courses, 85
 Statistics, 75, 101
 Student Activities Fee, 9, 10
 Student Financial Aid, 12
 Student Health Service, 12
 Student Services, 11
 Supplemental Fees, 10
 Supplemental Plan for Sickness and
 Accident Insurance, 12

T

Television, see Journalism, 56, 93, or
 Speech and Dramatic Art, 74, 100
 Termination of Graduate Status, 14
 Thesis, 15
 Transfer of Credit, Master's, 15
 Tuition, Nonresident, 10

U

UM Traveling Scholar, 20
 University Press, 7

V

Vehicle Registration, 10
 Veterans, 12
 Veterinary Biomedical Sciences, 76, 101
 Veterinary Medicine and Surgery, 76,
 101
 Veterinary Medicine Research Farm, 8
 Veterinary Microbiology, 77, 101
 Veterinary Pathology, 78, 101
 Veterinary Pharmacology and
 Toxicology, 101
 Veterinary Physiology, 101

W

Western Historical Manuscript
 Collections, 5
 Western Americana Collection, 5
 Withdrawal, 11
 Women Studies, 101

Z

Zoology, see Biological Sciences, 29



UNIVERSITY OF MISSOURI-COLUMBIA GRADUATE APPLICATION

Please Print (In Ink) or Type and DO NOT Write in Shaded Areas.
See Additional Instructions on Reverse Side

UMC Student Number

--	--	--	--	--	--	--	--	--	--

C

1. Name

Last	First	Middle	Or other name
------	-------	--------	---------------

2. Social Security Number

--	--	--	--	--	--	--	--	--	--

3. I would like information concerning financial aid. (See instruction no. 5) Yes No **4. Veteran of the U.S. Armed Forces?** Yes No

5. Permanent Address and Telephone Number (This address will be used for all University correspondence prior to your first registration)

Number & Street or RFD No.	Apt. No. or Box No.	City
State <table border="1" style="display: inline-table; width: 40px; height: 15px; text-align: center;"> </table>	Zip <table border="1" style="display: inline-table; width: 40px; height: 15px; text-align: center;"> </table>	Country <table border="1" style="display: inline-table; width: 40px; height: 15px; text-align: center;"> </table> Area Code <table border="1" style="display: inline-table; width: 40px; height: 15px; text-align: center;"> </table> Telephone Number <table border="1" style="display: inline-table; width: 100px; height: 15px; text-align: center;"> </table> County <table border="1" style="display: inline-table; width: 40px; height: 15px; text-align: center;"> </table>

6. Previously been enrolled at UMC? Yes No **7. Ever enrolled in Correspondence (Indep. Study) or Extension Courses at UMC?**

Correspondence Yes No Extension Yes No

If yes, complete a request to re-enroll. If yes, when _____ If yes, when _____

8. Graduate degree sought at UMC? Degree program _____ Masters _____ Specialist _____

Doctorate _____ Professional _____ None _____

9. Term of expected entrance (Check One) Fall Winter Summer Year: _____

10. Name and location of ALL colleges attended, Dates of attendance, Degrees earned or expected prior to enrollment at UMC. If currently enrolled, indicate in date space. List schools beginning with most recent. (Failure to indicate colleges or universities in which you have been enrolled will void your admission.)

NAME OF COLLEGE	LOCATION (CITY & STATE)	DATES OF ATTENDANCE	DEGREES EARNED	DEGREE DATES	LVL-MOD <table border="1" style="width: 100%; text-align: center;"> </table>	O.E.C. <table border="1" style="width: 100%; text-align: center;"> </table>
1.						
2.						
3.						
4.						
5.						
6.						
7.						

11. Previous to opening day of classes, will you have satisfied the 1 year residence requirement in Missouri? Yes No (See instruction no. 4)

12. Date of Birth Month

 Day

 Year

13. Place of Birth City

 State

 Country

14. Religious Preference (Optional) _____ **15. Citizen of the U.S.?** Yes No Permanent Resident of U.S. Yes No

If no, what country? _____ (See instruction no. 8)

16. Have you taken the required Graduate level examinations? _____ Yes _____ No (See instruction no. 7)

If yes, have these scores been submitted to the UMC Graduate Office? _____ Yes _____ No

Indicate test and date: GRE _____ / _____ month/yr. GMAT _____ / _____ month/yr. MAT _____ / _____ month/yr. TCM _____ / _____ month/yr.

17. Legal Signature (In Ink) _____ **18. Date** _____

This information is optional and requested for purposes of reporting to Federal Compliance Agencies only and will not be used in determining admissions status:

19. Sex Male Female

20. Ethnic Origin (Non-Citizen Permanent Residents of U.S. must designate ethnic origin other than Non-Resident Alien)

American Indian/Alaskan Native Hispanic
 Asian or Pacific Islander White-Non Hispanic
 Black-Non Hispanic Non-Resident Alien (F or J Visa)

21. Do you consider yourself physically disabled? Yes No

OAR-3-85

Complete all items and return this form, with check or money order for twenty dollars (\$20.00), fifty dollars (\$50.00) for international students, to: Director of Admissions, 130 Jesse Hall, University of Missouri-Columbia, Columbia, MO 65211

UMC APPLICATION FOR GRADUATE ADMISSION

1. Applications—Fill out this form completely and send it with check or money order for twenty dollars (\$20.00) to the Director of Admissions, 130 Jesse Hall, University of Missouri-Columbia, Columbia, MO 65211. You will also need to have transcripts sent to the above address as explained below.

Failure to complete this form fully will void your admission. Providing misinformation concerning previous enrollment in other colleges or universities will also void your admission.

Some information requested on this form is required by Title VI of the Civil Rights Act of 1964, Title IX of the Higher Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973 and will be reported to federal compliance agencies concerned with equal educational opportunity. We ask for this information in order to keep the records required by the federal government, and to prevent discrimination on the basis of race, color, religion, handicap, national origin or sex.

APPLICATION FEE—A check or money order made payable to the University of Missouri-Columbia for twenty dollars (\$20.00) must accompany your application. Application fee for international students is fifty dollars (\$50.00). This fee is non-refundable but is credited to incidental fees upon the student's enrollment.

2. Transcripts—No transcript will be accepted directly from you. You must have the school you attended send your transcript to the Director of Admissions, 130 Jesse Hall, University of Missouri-Columbia, Columbia, Missouri 65211. These official transcripts must include baccalaureate degree and any additional graduate work. No action on your admissions will be taken until all transcripts

and your completed admissions form are on file with the admissions office.

All transcripts become the property of UMC. After one semester, transcripts will be destroyed for those applicants who do not enroll at UMC.

3. Application deadlines are set by departments. Contact the department directly for this information. Deadlines for unclassified graduate students are July 1 for the Fall Semester, December 1 for the Winter Semester, and May 1 for the Summer Session.

International students should refer to information furnished by the Office for International Student Programs, 114 Read Hall, UMC, for application deadlines.

4. Out-of-State Applicants—It is your duty to apply and register under the proper residence and to pay the proper tuition fees. A pamphlet giving detailed information on tuition and residence rules may be obtained from the admissions office, 130 Jesse Hall or the cashier's office, 123 Jesse Hall.

5. Financial Aid—An application for admission to UMC does not serve as an application for financial aid. UMC accepts either the Family Financial Statement (FFS) of American College Testing or the Financial Aid Form (FAF) of the College Scholarship Service. Forms are available from the Office of Student Financial Aids, 11 Jesse Hall. These forms should be completed and received by February 26. Late applications will be considered according to the date received and the availability of funds.

6. Housing—An application for admission to UMC does not serve as an application for housing. Student housing information and applications for University-owned residence halls are mailed to all who apply for admission. Beginning March 1, this material will be mailed to

those who have applied for the Fall Semester. Material will be mailed October 1 to those who have applied for the Winter Semester and April 1 for those who have applied for the Summer Session.

7. The Graduate Record Examination (GRE)—All graduate students are required to submit the aptitude scores of the GRE prior to admission. A student may be admitted with permission from the graduate dean without test scores if the examination is taken during the first enrolled semester. The student may enroll in a second semester only if the required test scores are on file in the Graduate School.

Some departments require a test in place of the GRE, such as the Miller Analogy (MAT), Terman Concept Mastery (TCM), or the Graduate Management Admission Test (GMAT). You should check the department requirement at the time of application.

8. Students from countries where English is not the native language must take the Test of English as a Foreign Language (TOEFL), given by the Educational Testing Service, Princeton, N.J., 08540. The test is given approximately six times each year in test centers in almost every country of the world. The test should be taken from six to nine months before the opening of the session in which you expect to enroll. A minimum score of 500 must be achieved before formal application forms are sent. Some departments require scores higher than the 500 minimum. Please contact the department for further information.

Send your applications to:
Director of Admissions
130 Jesse Hall
University of Missouri-Columbia
Columbia, MO 65211

ACADEMIC CALENDAR

FALL SEMESTER	1986			
Orientation & Registration	M	Aug 25		
Registration	T	Aug 26		
Classwork begins, 7:40 a.m.	W	Aug 27		
Labor Day recess	M	Sep 1		
Thanksgiving recess begins, close of day*	T	Nov 25		
Classwork resumes, 7:40 a.m.	M	Dec 1		
Classwork ends, close of day*	Th	Dec 11		
Stop Day	F	Dec 12		
Final examinations begin	S	Dec 13		
Fall Semester closes 5:00 p.m.	F	Dec 19		
WINTER SEMESTER	1986	1987		
Orientation & Registration	Th	Jan 16	Th	Jan 15
Registration	F	Jan 17	F	Jan 16
Classwork begins, 7:40 a.m.	M	Jan 20	M	Jan 19
Spring recess begins, 12:30 p.m.	S	Mar 15	S	Mar 14
Classwork resumes, 7:40 a.m.	M	Mar 24	M	Mar 23
Classwork ends, close of day*	Th	May 8	Th	May 7
Stop Day	F	May 9	F	May 8
Final examinations begin	S	May 10	S	May 9
Winter semester closes, 5:00 p.m.	F	May 16	F	May 15
ANNUAL COMMENCEMENT	S	May 17	S	May 16
SUMMER SESSION	1986	1987		
<i>8-week session</i>				
Orientation & Registration	M	Jun 9	M	Jun 8
Classwork begins, 7:30 a.m.	Tu	Jun 10	Tu	Jun 9
Independence Day recess	F	Jul 4	F	Jul 3
8-week session closes	F	Aug 1	F	Jul 31
<i>First 4-week Session</i>				
Orientation & Registration	M	Jun 9	M	Jun 8
Classwork begins, 7:30 a.m.	Tu	Jun 10	Tu	Jun 9
Independence Day recess	F	Jul 4	F	Jul 3
First 4-week session closes	Th	Jul 3	Th	Jul 2
<i>Second 4-week session</i>				
Registration, classwork begins, 7:30 a.m.	M	Jul 7	M	Jul 6
Second 4-week session closes	F	Aug 1	F	Jul 31
SUMMER COMMENCEMENT	F	Aug 1	F	Jul 31

*Close of day is defined as including late afternoon and evening classes, 10:00 p.m.

1985-86 GRADUATE SCHOOL DEADLINES

1985 FALL SEMESTER

October 17	Final date for comprehensive examinations for the PhD and matriculation for the EdD (May graduation)
October 21	Final date for submitting doctoral dissertations for Plan 1 students
October 28	Final date for submitting doctoral dissertations for Plan 2 students
November 4	Final date for submitting masters theses
November 15	Final date for filing applications for masters and educational specialist degrees for those who expect to receive degrees at the close of the next semester (May graduation)
December 3	Delayed grades and final oral examination results for candidates for the doctoral degree are due in the Graduate School
December 10	Delayed grades and final oral examination results for candidates for the masters degree are due in the Graduate School
December 12	Masters students not otherwise enrolled must have completed enrollment by this date
December 12	Final date for comprehensive examinations for the PhD and matriculation for the EdD (August graduation)

1986 WINTER SEMESTER

March 28	Final date for submitting doctoral dissertations for Plan 1 students
March 28	Final date for filing applications for masters and educational specialist degrees for those who expect to receive degrees at the close of the next semester (August graduation)
April 2	Final date for submitting masters theses
April 4	Final date for submitting doctoral dissertations for Plan 2 students
April 23	Delayed grades and final oral examination results for candidates for the doctoral degree are due in the Graduate School
May 1	Delayed grades and final oral examination results for candidates for the masters degree are due in the Graduate School
May 8	Masters students not otherwise enrolled must have completed enrollment by this date
May 8	Final date for comprehensive examinations for the PhD and matriculation for the EdD (December graduation)

1986 SUMMER SESSION

June 25	Final date for submitting doctoral dissertations for Plan 1 students
July 1	Final date for filing applications for masters and educational specialist degrees for those who expect to receive degrees at the close of the next semester (December graduation)
July 1	Final date for submitting masters theses
July 2	Final date for submitting doctoral dissertations for Plan 2 students
July 28	Delayed grades and final oral examination results for candidates for advanced degrees this semester are due in the Graduate School
August 1	Masters students not otherwise enrolled must have completed enrollment by this date

1986 FALL SEMESTER

October 16	Final date for comprehensive examinations for the PhD and matriculation for the EdD (May graduation)
October 22	Final date for submitting doctoral dissertations for Plan 1 students
October 29	Final date for submitting doctoral dissertations for Plan 2 students

- November 4 Final date for submitting masters theses
 - November 12 Final date for filing applications for masters and educational specialist degrees for those who expect to receive degrees at the close of the next semester (May graduation)
 - December 5 Delayed grades and final oral examination results for candidates for the doctoral degree are due in the Graduate School
 - December 9 Delayed grades and final oral examination results for candidates for the masters degree are due in the Graduate School
 - December 11 Masters students not otherwise enrolled must have completed enrollment by this date
 - December 11 Final date for comprehensive examinations for the PhD and matriculation for the EdD (August graduation)
-

Dual enrollment applications are due in the Graduate School one month after the first day of classes for fall and winter semesters and three weeks after the first day of classes for summer session.

NOTES

NOTES



an equal opportunity institution

University Libraries
University of Missouri

Digitization Information Page

Local identifier Catalog-Undergrad [1985-87]

Source information

Format Book
Content type Text
Source ID 010-500475050 (MU-SPEC item but transferred to Archives)
Notes

Capture information

Date captured June 2023
Scanner manufacturer Fujitsu
Scanner model fi-7460
Scanning system software ScandAll Pro v. 2.1.5 Premium
Optical resolution 600 dpi
Color settings 24 bit color for front cover; 8 bit grayscale for the rest
File types tiff
Notes

Derivatives - Access copy

Compression Tiff: LZW compression
Editing software Adobe Photoshop
Resolution 600 dpi
Color 24 bit color for front cover; 8 bit grayscale for the rest
File types pdf created from tiffs
Notes Images cropped, straightened, brightened.