



COLLEGE OF VETERINARY MEDICINE  
UNIVERSITY OF MISSOURI-COLUMBIA

'07  
COLLEGE CATALOG  
08





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## *The Oath*

Being admitted to the profession of veterinary medicine, I solemnly swear to use my scientific knowledge and skills for the benefit of society through the protection of animal health, the relief of animal suffering, the conservation of animal resources, the promotion of public health, and the advancement of medical knowledge.

I will practice my profession conscientiously, with dignity, and in keeping with the principles of veterinary medical ethics.

I accept as a lifelong obligation the continual improvement of my professional knowledge and competence.

*Adopted by the AVMA in November 1999,  
Reaffirmed in April 2004*



# CVMUMC

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## Greetings from the College



### ★ *The Mission*

The comprehensive mission of the College of Veterinary Medicine (CVM) is to provide excellence in professional, graduate, and undergraduate education; animal disease diagnosis; patient care; extension education of the public; continuing education of veterinarians; and research. These programs benefit the veterinary profession and the livestock, poultry, and companion animal-owning public; support wildlife conservation programs; bolster the economy of Missouri; support agricultural and biomedical research; offer educational opportunities to Missouri residents; and provide competent veterinarians needed to assure the protection of animal health, the relief of animal suffering, the promotion of public health, and the advancement of medical knowledge.

## Excellence in Teaching, Healing, Research, and Leadership

★ **The MU College of Veterinary Medicine** has graduated more than 2,800 DVMs in its 50+ year history. Alumni live and work all over the world in a variety of areas.

Thank you for your interest in the University of Missouri's College of Veterinary Medicine. The College enters the 21st Century committed to building on its rich tradition of educating veterinarians, providing service to the animal-owning public, and advancing knowledge of animal disease. We hope this catalog will answer questions regarding our programs and provide insight into the exciting career opportunities in veterinary medicine.

The MU College of Veterinary Medicine has a three-fold mission in teaching, service, and research. It is the only Missouri institution that awards the Doctor of Veterinary Medicine degree, graduating about 72 new veterinarians each year.

We truly attract the best and brightest to our profession. Our students are truly the College's best ambassadors. Prior to admission, these students must complete a minimum of 60 semester hours of college-level courses. Those admitted to the professional program progress through a rigorous four-year curriculum. Courses in the first two years provide a solid foundation in basic science, followed by two years of largely hospital-based instruction.

Our graduates are qualified to pursue a host of career options. Most enter private clinical practice, but others choose careers in government, industry, and academia. The College also offers post-graduate training to interns, residents in various specialties, and graduate students. These individuals are among the most dedicated and hard working people you will ever meet. They generally have trained elsewhere and bring a differ-

ent perspective. The interaction among faculty and both veterinary and postgraduate students creates a special synergy, ideal for learning.

Have you noticed that people today want to provide their animals with the same quality health care they receive themselves? We have! These needs are met through the College's Veterinary Medical Teaching Hospital and Veterinary Medical Diagnostic Laboratory. The teaching hospital has been housed since 1993 in Clydesdale Hall, a truly state-of-the-art facility with 140,000 square feet of floor space spread over three hospitals for small companion animals, horses, and farm animals.

Our clinical faculty provides both primary care and a host of sophisticated diagnostic procedures and treatment options not available in most private practices. Examples include a magnetic resonance imaging (MRI)



unit, hip replacement surgery, a treadmill for evaluation of lameness in horses, and herd-health consultation for farmers.

Overall, each year, we care for approximately 17,000 hospitalized animals and thousands more on farms. Many of these animals come from the Columbia area for primary care and others are referred to the hospital by veterinarians throughout the Midwest for specialized services. The Veterinary Medical Diagnostic Laboratory provides comprehensive services for companion and farm animals. In particular, the laboratory works conscientiously with veterinarians and farmers to protect Missouri's 3 billion-dollar animal agriculture industry. The diagnosis of animal diseases has become increasingly complex, as new conditions emerge and we learn more about previously-recognized syndromes. Our faculty have taken the lead in developing advanced diagnostic techniques based on methods such as polymerase chain reaction (PCR) and immunohistochemistry. Around 40,000 accessions are processed through the laboratory each year.

Through its research mission, the College fulfills a solemn obligation to advance our understanding of diseases affecting not just animals but also people. After all, we share the same environment and are exposed to the same infectious organisms and environmental pollutants. It should come as no surprise, therefore, that animals and their owners develop many of the same diseases. To pursue the causes of these conditions, faculty of the College of Veterinary Medicine now collaborate extensively with our colleagues in human medicine, agriculture, and other scientific disciplines.

As an example, the College recently received notification that a \$9.6 million dollar grant from the National Institutes of Health (NIH) to study the protective effects of exercise on cardiovascular function has been funded for a third five-year cycle. Working closely with colleagues from other divisions, our faculty continue to study diseases affecting farm animals, with particular emphasis on infectious conditions and reproductive disorders.

College faculty have also received NIH funding to establish a regional biocontain-

ment laboratory that will contribute to the nation's biodefense network. Additional federal support has allowed construction of a national laboratory to characterize swine models of human disease. We're also committed to enhancing other College facilities. In fact, through the ongoing For All We Call Mizzou fund-raising campaign, priority has been placed on improving our library and classrooms. Just within the past year, the College has received two \$1 million commitments from Dr. James Nave and Mrs. Thelma Zalk to renovate the library.

A special faculty is required to fulfill such a diverse set of responsibilities in teaching, service, and research. Fortunately, the College of Veterinary Medicine has always had a strong group of educators. And, the good news is that our faculty has been further bolstered in recent years through the generosity of individual and corporate friends. Seven endowed professorships or programs have been established at the College since 1994. These include the Ruth M. Kraeuchi-Missouri Professorship in Veterinary Ophthalmology, the Gilbreath-McLorn-Missouri Professorship in Comparative Medicine, the Nestlé Purina-Missouri Program in Small Animal Nutrition, the E. Paige Laurie-Missouri Program in Equine Lameness, the Tom and Betty Scott-Missouri Program in Veterinary Oncology, the Charles and Charlene McKee-Missouri Professorship in Microbial Pathogenesis, and the Thelma Zalk-Missouri Professorship in Tumor Angiogenesis. What a difference these endowments have made, not just in fulfilling our responsibilities, but also in enhancing the College's national reputation! Through the collective efforts of our dedicated faculty, staff, and students, the University of Missouri College of Veterinary Medicine is increasingly viewed as a leader in the profession.

This catalog outlines the multiple dimensions of veterinary medicine and details the teaching, service, and research programs of the College. Information on admissions requirements, the DVM curriculum, and career opportunities are also included. We hope you share our enthusiasm for veterinary medicine and, in particular, MU's College of Veterinary Medicine. If you have questions, please call.

- 
- **A Host of Career Options**
  - **State of the Art Facilities**
  - **Research Opportunities**
  - **Corporate Grants and Endowments**
  - **Dedicated Renowned Faculty**
  - **Leader Among Colleges of Veterinary Medicine**
  - **Lifelong Friendships**
  - **Professional Pride**



# Quality of Life in Columbia, Missouri



Enjoy  
beautiful campus



friendships

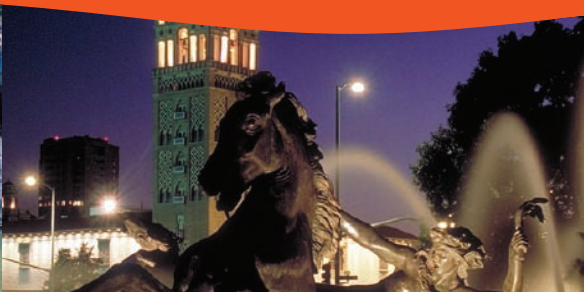


trails

Relaxing Streams and Lakes

Visit Cities Nearby

Join The Band







## leadership experiences

• **In recent years**, Columbia, Mo. has been listed consistently among the top 20 US cities in several national rankings. This assessment is based on the community's low cost of living; its stable, service-oriented economy, low crime rate; and the availability of affordable housing and outstanding health care. Columbia's excellent public schools, its weather, and its leisure and cultural activities also contribute to a high quality of life.

Columbia is centrally located 120 miles from both Kansas City and St. Louis. The college community of more than 85,000 offers an unusual combination of rural and metropolitan experiences.

There are more than 3,000 acres of state park lands within ten miles of Columbia. The city itself has 1,500 acres of beautiful parks. Federal forests and wildlife refuges are nearby, as is the Katy Trail—a hiking and biking trail that stretches across Missouri and is accessible throughout Columbia.

Hunting and fishing opportunities abound in central Missouri and the Lake of the Ozarks area. Columbia is only a few hours' drive from scenic

lakes and streams that are ideal for float trips, camping, and backpacking. Kansas City and St. Louis both have major-league sports teams, and the University offers Big 12 Conference football, basketball, baseball, and other sports. Columbia has a 65,000-seat stadium, a 15,000-seat multipurpose auditorium, and a new basketball arena. The area also offers several 18-hole golf courses, tennis courts, racquetball courts, squash courts, and indoor and outdoor swimming pools.

Living conditions in Columbia are good and housing is plentiful. Many students elect to live in rural Boone County, which is only a short distance from the MU College of Veterinary Medicine. The climate is mild with four distinctive seasons.

Companion animals and livestock are important to Missouri. Missouri is second in the nation in the number of beef cattle operations and calf production. It is fifth in hog operations and turkeys raised and third in horses and dairy operations. More than half of all households in Missouri own companion pets.

• Organized Sports



• Fun Run



• Up, Up and Away



• Cycling



• Rockclimb



• Downtown Columbia





# MU: A Major Research and Teaching University



The University of Missouri is a nationally competitive, global university

# Respect the famous "columns"



\* MU is one of only 34 public U.S. universities, and the only public institution in Missouri, to be selected for membership in the Association of American Universities (AAU) and designated Doctoral/Research Extensive by the Carnegie Foundation for the Advancement of Teaching. AAU membership recognizes excellence in teaching and research endeavors and includes only the nation's top-tier institutions.

\* MU provides all the benefits of two universities in one—it's a major land-grant institution and Missouri's largest public research university.

\* MU is one of only six public universities in the country with medicine, veterinary medicine, animal science, and law all on one campus. Two-thirds of Missouri veterinarians are MU graduates. Mizzou's academic human and veterinary medical centers treat patients from every county in the state.

\* Currently, more than 700 faculty life scientists at MU are working to improve human and animal health, our food supply, and the environment.

\* MU boasts some of the world's top scientists in wheat, corn, and soybean research and ranks first in the country in the amount of funding from the National Science Foundation for plant genomics research.





\* **MU** veterinary medical extension specialists, through herd health management consultation and medical care, are directly responsible for increasing the efficiency of Missouri's food animal production. Every one percent productivity increase in the state's \$2.5 billion livestock industry results in an increase of \$25 billion more sales for the state's producers.

\* **MU** is home to the world's most powerful university research reactor and is the largest U.S. producer of radioisotopes for the diagnosis and treatment of cancer.

\* As Missouri's flagship university, **MU** has 20 schools and colleges and more than 275 degree programs—including two dozen online options—to help students reach their career and personal goals.

\* **MU** is highly ranked in quality and value by U.S. News & World Report, The Fiske Guide to Colleges, and Barron's Best Buys in College Education.

\* The National Science Foundation has recognized **MU** as one of the top ten universities in the country for successfully integrating research into undergraduate education.





# Healing

radiation therapy



## The MU College of Veterinary Medicine has a long and distinguished history in service and leadership and a growing national reputation.

### History

• Veterinary education at the University of Missouri began in 1884 as a course in veterinary science. In 1885, the first vaccine-virus laboratory in the United States was established at the veterinary science department. A veterinary laboratory was erected in 1887. In early years, staff veterinarians taught courses to medical and agricultural students, conducted research on tick fever, and investigated livestock disease throughout the state.

The College's first building, Connaway Hall, was built in 1910–11 to house veterinary science faculty who taught courses to agricultural students, investigated animal and poultry diseases, performed diagnostic and extension work, and produced animal vaccines.

The professional curriculum leading to the DVM degree was established in 1946 to offer educational opportunities to World War II veterans. In 1950, 26 new graduates were awarded the first DVM degrees from the University of Missouri.

From 1946-65 there were 30 Missouri residents in each of the four classes studying for the DVM degree. In 1965, class size doubled and non-residents were admitted in response to federal funding incentives. These federal "capitation" funds were provided to alleviate a national shortage of veterinarians and stimulated a further increase in class size to 76 students in 1976. In the early 80's, the national need for veterinarians stabilized, federal funding was withdrawn and the class size was lowered to 64. The College has graduated more than 2,700 veterinarians since 1946.

A teaching hospital was built in 1961, and a diagnostic laboratory and a teaching-research building were added in 1977. Clydesdale Hall, a 149,000-sq.-ft. medical

teaching hospital, was completed and occupied in March 1993. Multi-million dollar renovations of the veterinary diagnostic laboratory and Connaway Hall were completed in 1997 and 1999, respectively. The 1961 teaching hospital was renovated in 1997 and 2002 to enhance classrooms, provide new research space, and add a conference center.

- The MU College of Veterinary Medicine has a unique clinical curriculum. Clinical training is initiated at the start of the third year of the professional curriculum and incorporates flexibility to allow students to preceptor at private practices.
- The Veterinary Medical Teaching Hospital and the Veterinary Medical Diagnostic Laboratory are the only full-service veterinary diagnostic centers in the State of Missouri. They are among only five such centers in the Midwest.
- MU offers unique collaborative opportunities between its divisions and other institutions. MU is one of only a few veterinary medical colleges on the same campus as a medical college. There are currently joint programs underway in orthopedics, ophthalmology, oncology, and other areas. The proximity and size of the MU Animal Science Research Center has resulted in many collaborative projects. The Dalton Cardiovascular Research Center and the MU Research Reactor are facilities that give MU investigators unique opportunities for many types of research. Washington University, St. Louis University, and Lincoln University provide additional opportunities for collaborative research or instructional grants.
- The Zalk Veterinary Medical Library is a regional resource of information for research and clinical investigators. Holdings include more than 20,000 books and 21,000 volumes.
- MU's location between two major metropolitan areas and adjacent rural areas allows for a strong caseload in companion, equine, and food animal species.
- The Comparative Medicine Training Program is the most successful in the nation. This program has been funded continuously by the National Institutes of Health for more than three decades.
- The National Swine Research and Resource Center, the National Rat Resource and Research Center, and the Mutant Mouse Regional Resource Center are housed at the College, strengthening MU's abilities in disease diagnosis, identification, and prevention.
- Faculty from the Department of Veterinary Pathobiology were instrumental in obtaining a Regional Biocontainment Laboratory for the MU campus.
- The Department of Biomedical Sciences has active and successful research programs in exercise physiology, cardiovascular disease, and gender physiology. The area of reproductive biology at the MU College of Veterinary Medicine includes studies on reproductive disorders, premature birth, embryo transfer, prostate development, and breast cancer mechanisms.
- Seven endowed professorships or programs have been established at the MU College of Veterinary Medicine since 1994:
  - Tom and Betty Scott from Kansas City endowed a program that will



## The College of Veterinary Medicine

allow the College to become a major Midwestern referral center for animals suffering from cancer. Cancer diagnosis is aided by the use of Magnetic Resonance Imaging (MRI), Computed tomography (CT), and a linear accelerator.

- The E. Paige Laurie-Missouri Program in Equine Lameness will facilitate research related to improving the diagnosis and treatment of lameness in horses. This endowment was made possible by a gift from Bill and Nancy Laurie, owners of Crown Center Farm in Columbia, Mo., and named in honor of their daughter, Paige.
- The Charles and Charlene McKee Professorship in Microbial Pathogenesis endowed the recruitment of a leader in infectious disease research.
- The Thelma Zalk-Missouri Professorship in Tumor Angiogenesis will integrate the College's strong vascular biology and cancer programs.
- The Ruth M. Kraeuchi Endowed Professorship investigates structural and functional aspects of retinal cell biology, comparative aspects of clinical retinal disease, and intraocular microsurgery.
- The Gilbreath-McLorn Professor of Comparative Medicine conducts research in comparative medicine, cryobiology, and reproductive biology.
- The Nestle Purina-Missouri Program in Small Animal Nutrition is studying ways that nutrition can prevent disease and enhance overall health.

### Programs and Distinctive Features

- The MU College of Veterinary Medicine is the only institution in Missouri that awards the Doctor of Veterinary Medicine degree (DVM). The professional curriculum is integrated with College services including statewide animal disease diagnostic services, extension and continuing education programs for animal owners and veterinarians, patient care referral and consultation services for all species of animals, research programs in animal and human diseases, and advanced specialized training in veterinary and comparative medicine.
- The curriculum is carefully monitored by the Council on Education of the American Veterinary Medical Association. To be accredited, the College must maintain high teaching standards, and students must develop knowledge, skills, and experience in diseases and health-related conditions of all species of domestic animals.
- Animal facilities and management are fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care (AALAC).

### Service Units and Programs

- *The Veterinary Medical Teaching Hospital*, Clydesdale Hall, is a state-of-the-art teaching and medical service facility. The VMTH is an integral component of the College, and is essential to the teaching mission since it is the required teaching laboratory for training students for the DVM degree. Faculty and students in the VMTH diagnose and treat more than 17,000 patients annually. Students are involved in all cases. The hospital is a clinical laboratory, providing specialty services to animal owners in Missouri and throughout the Midwest.

- *The Veterinary Medical Diagnostic Laboratory* at the College conducts 200,000 diagnostic tests annually. It is the only veterinary diagnostic laboratory in Missouri fully accredited by the American Association of Veterinary Laboratory Diagnosticians. The facility also includes a clinical pathology laboratory housed in the Veterinary Medical Teaching Hospital. Faculty assigned to this facility participate in the service mission of the laboratory and also in the training of veterinary students, residents, and graduate students.
- *The Research Animal Diagnostic Laboratory (RADIL)* provides a one of a kind training laboratory for residents and graduate students in the University of Missouri Comparative Medicine Training Program. This unique service unit combines a fee-for-service laboratory animal diagnostic laboratory with a specialty-training program for veterinarians who wish to pursue careers in laboratory animal medicine and comparative medicine research.

Trainee activities include coordination of necropsy accessions, animal necropsy, and interpretation of results from MU RADIL parasitology, microbiology, serology and molecular biology laboratory testing. Trainees are exposed to a broad range of cases from many species of animals ranging from genetically engineered rodents to primates to amphibians and reptiles. The MU RADIL laboratories provide a window to the many contemporary problems and questions that face the laboratory animal community.

This has led to development of a number of student research projects involving discovery and characterization of novel emerging disease causing agents, development of diagnostic tests and development of new animal models for human disease.

RADIL's service mission includes the Comparative Medicine Program. This postdoctoral (post-DVM) program prepares graduates for research and service careers in comparative medicine and laboratory animal medicine and meets the training requirements for eligibility for the American College of Laboratory Animal Medicine (ACLAM) certification examination.

The CMP emphasizes comparative medicine research training and includes graduate course work and residency rotations. In the first year of training, trainees rotate in diagnostic laboratory animal pathology and microbiology in the Research Animal Diagnostic Laboratory (RADIL) and clinical medicine and animal resource management in the Office of Animal Resources (OAR). The remaining two to four years of the training time are primarily devoted to research training under an established investigator. Throughout the program, fellows participate in teaching and instructional programs offered to veterinary students and research personnel.

- *Veterinary Medical Extension and Continuing Education* serves the people and institutions of the state. Veterinary medical extension faculty and staff interact with College faculty and the university community to plan and deliver educational programs.

Veterinary Medical Extension provides opportunities for continuing education for practicing veterinarians and educational program for the general public. The objective is to increase the professional knowledge of veterinarians and improve the quality of veterinary medicine. Continuing professional education activities include articles in newsletters, guide sheets, conferences, seminars, and short courses.

A mid-career program is available to give in-depth individualized training in special areas to practicing veterinarians or those veterinarians changing their focus. Veterinary Medical Extension works in conjunction with their Extension colleagues throughout the state to acquaint owners of food producing and companion animals to



current medical services and principles of preventive medicine. Information regarding disease problems is presented to animal owners and allied interest groups in several ways, including phone consultation, field investigative visits, seminars, and newsletters.

Group meetings on general subjects are requested by, or scheduled through, area and state extension specialists. Participants are encouraged to ask questions and to relate their experiences and problems. Local practicing veterinarians also are invited to attend and participate in these programs. Veterinary Medical Extension strives to provide the practicing veterinarian and general public with the latest information available.

- *The MU-CVM Information Technology Unit (CVM-IT)* maintains a state-of-the-art information management technology system supporting the College's teaching, service, and research missions. CVM-IT provides end-user support for the CVM's computing technology infrastructure for biomedical research, veterinary care, educational applications, specialized graphics arts production services, and College-wide administrative support. The unit assists faculty, staff, and students in the development of materials for educational and research presentations.

#### Facilities of the College

- *The Veterinary Medical Diagnostic Laboratory* provides in-depth laboratory diagnostic support to veterinary practitioners, livestock and poultry industry farmers, pet owners, wildlife conservationists,

state and regulatory officials, and clinicians of the MU Veterinary Medical Teaching Hospital.

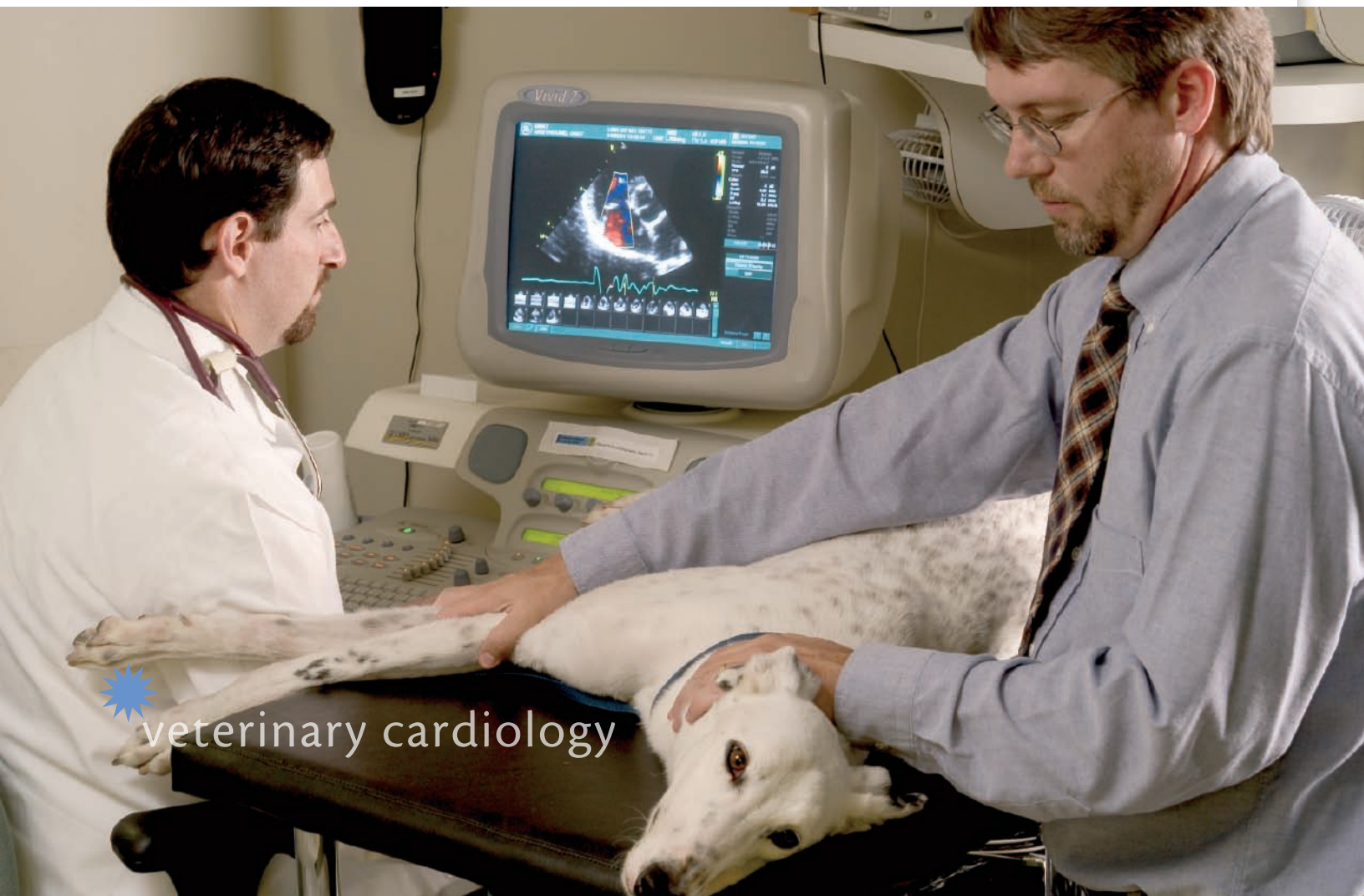
The laboratory handles more than 200,000 specimens a year and serves all of Missouri's 114 counties and surrounding states by performing over 300,000 diagnostic tests annually. The facility supports toxicology, histopathology, serology, clinical pathology, bacteriology, molecular biology, and virology diagnostic laboratories. It also provides the opportunity for veterinary medical students to receive instruction in diagnostic laboratory medicine.

It is one of only 41 veterinary medical diagnostic laboratories in the nation accredited by the American Association of Veterinary Laboratory Diagnosticians.

- *Clydesdale Hall* (the Veterinary Medical Teaching Hospital) serves as a comprehensive medical center and as a setting for clinical instruction.

All levels of patient care, extending from routine preventive medicine to referral services in most clinical disciplines are provided. Students pursuing the DVM degree and interns/residents engaged in postgraduate training actively participate with Department of Veterinary Medicine and Surgery faculty and staff in each phase of patient care.

New capabilities are continually being added to the VMTH to ensure state-of-the-art service. Recent examples include the establishment of an electronic medical records system and digital imaging upgrades. Also, a MRI was added for improved diagnostic abilities.



 veterinary cardiology



## The College of Veterinary Medicine



★ Clydesdale Hall

The VMTH is accredited by the American Animal Hospital Association and certified by the Missouri Veterinary Medical Board.

Clydesdale Hall includes three separate hospitals for horses, food animals, and companion animals. The Equine Hospital occupies approximately one-third of the first floor and includes about 35 stalls, a neonatal unit, two large surgery suites, a special diagnostics room, an arena, and a treadmill for evaluation of equine lameness. An equine field-service program was launched in 2001 to complement in-hospital services.

The Food Animal Hospital also occupies approximately one-third of the first floor and provides comprehensive health care for livestock. The design of the corrals, stalls, and chutes permits efficient, safe movement and restraint of cattle. About 35 stalls are available; some are designed to manage paralyzed cattle and recumbent calves. The Food Animal Ambulatory Service provides individual and herd-health services for area livestock through the use of fully equipped vehicles.

The Companion Animal Hospital has 16 examination rooms (one specialized for oncology examinations, two for cardiology exams, and two for specialized ophthalmology cases), and more than 150 cages and runs. Each exam room contains a computer for quick access to the computerized hospital information system so

students can enter and retrieve client/patient data while examining the patient.

The Community Practice Service provides preventative medicine, dentistry, and routine small animal outpatient services. Veterinarians throughout the state and region refer clients to the Companion Animal Hospital to take advantage of its many specialized veterinarians.

The hospital also houses a variety of state-of-the-art equipment including computerized tomography (CT), magnetic resonance imaging (MRI), a linear accelerator to administer radiation therapy, the Hill's Endoscopy Center, a cardiac catheterization laboratory, and specialized orthopedic and ophthalmology surgical suites. The hospital's intensive care unit (ICU), expanded in 2000, is staffed 24 hours a day.

- *The Veterinary Medicine Building* houses teaching laboratories, classrooms, seminar rooms, computer laboratories, a large amphitheater and conference room, administrative offices, and the veterinary medical library.

The Zalk Veterinary Library, a branch of MU's Ellis Library, has two learning centers with individual autotutorial carrels. Open daily, it is designed to serve the teaching and research needs of the College.

★ Connaway Hall



★ Aerial view of "The Quad"



★ Veterinary Medicine Building





Teaching laboratories facilitate learning through visual aids and demonstration materials, and provide work and storage space for each student.

The College has one of the largest computer facilities on the MU campus. One lab has 40 computers available on a 24/7 basis for student use. The other facility houses 80 computers for use in the teaching of histology, microbiology, parasitology, and pathology. This facility is also used to administer the computerized exams. This facility is primarily used as a lecture/laboratory, but is available for student use outside of normal class time.

The Veterinary Medicine Building also houses facilities for electron microscopy and transgenic animals, and the H. Richard Adams Conference Room and Auditorium. This 250-seat conference center and auditorium is used for meetings, research, teaching, and other instructional purposes by the College. It features state-of-the-art audiovisual and computer support equipment. The building also serves as the home for the University of Missouri Research Animal Diagnostic Laboratory (RADIL).

The Department of Veterinary Pathobiology and its associated teaching and research programs are located in *Connaway Hall*. It houses state-of-the-art research labs specializing in infectious disease research, genetic testing, and molecular biology.

- The *Veterinary Medical Science Building* accommodates research laboratories and office space for faculty and graduate students in the Departments of Biomedical Sciences, Veterinary Pathobiology, and the Veterinary Medical Diagnostic Laboratory.
- *Middlebush Farm* is a 288-acre farm south of Columbia that provides space and facilities for theriogenology instruction and veterinary medical research projects. College-owned herds of cattle and horses are maintained at this farm for teaching purposes.
- *Multi-User Equipment*. The College houses campus cores for electron microscopy and transgenic animals. Additional equipment available to all departments include a confocal microscope, a computerized tomography unit, a radioanalytic imaging system, an MRI, an optic imaging platform and frame integrator for ethidium bromine gels, a research animal angiography laboratory, and still photograph and video digitizing equipment.
- *Interdisciplinary programs* within the University permit the sharing of additional facilities with the MU College of Veterinary Medicine:
  - *The Low-Level Radiation Laboratory* is owned by the College of Agriculture, Food and Natural Resources. The low-level, whole-body radiation counter measures natural and induced radioactivity in animals and humans.

- *The Dalton Cardiovascular Research Center* provides 60,000 square feet of general laboratory and office space, and houses a specialized branch of Ellis Library. Interdisciplinary projects in cardiovascular physiology and related fields are coordinated by the center.
- *The Regional Biocontainment Laboratory* is a \$18 million facility that will house researchers fighting infectious pathogens such as West Nile virus. It will be located just south of the National Swine Research & Resource Center, and is one of only 13 such structures in the United States.
- *The Nuclear Reactor Research Facility* is the largest university-based research nuclear reactor in the nation is in MU Research Park. College of Veterinary Medicine faculty have access to this facility to conduct radiobiological experiments.
- *Ellis Library* is one of the largest university libraries in the United States, Ellis houses more than 2.5 million volumes and 17,500 serials and journals in its main and branch libraries.
- *The Missouri Agricultural Experiment Station* conducts research activities for the School of Natural Resources, and the Colleges of Human Environmental Sciences, Veterinary Medicine, and Agriculture Food and Natural Resources.
- *The Campus Computer Network*. This network of computing facilities assists the educational and research programs of all divisions at MU.

## Faculty

The faculty consists of more than 125 assistant, associate, or full professors. There are also 20 adjunct faculty members who assist in specialized areas. In addition, there are more than 50 graduate students and approximately 25 residents and interns.

## Student Body

The College graduates annually approximately 75 new veterinarians from the rigorous four-year curriculum. Students in the College are involved in many activities related to veterinary medicine. Several have held offices in the national Student American Veterinary Medical Association. Many are active in the local community, especially participating in pet-therapy groups, and other educational service organizations. A full listing of student clubs can be found at: <http://www.cvm.missouri.edu/clubs.htm>.

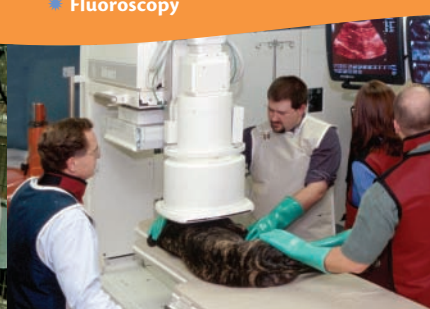
### • Ophthalmology



### • Intensive Care Unit



### • Fluoroscopy



### • Surgery





The College of Veterinary Medicine



**Alumni**

New graduates of the MU College of Veterinary Medicine receive more job offers at graduation than the national average for new veterinary medical graduates. Approximately 55 percent seek employment in small animal practices while 25 percent enter mixed animal practices and ten percent become predominately large animal practitioners. Another ten percent go into advanced study programs.

The more than 2,800 alumni of the College have been very successful in their chosen areas of the profession. Many become involved in community affairs by becoming

members of school boards, city councils, and mayors of towns and cities. Some are elected members of state legislative bodies. Many are elected to offices of state and national veterinary medical associations. Some have been prominent in federal positions. Others have advanced to prominence in veterinary medical colleges in teaching and research roles. Alumni have been active as administrators in veterinary medical colleges, industry, and government work. In the last 12 years, three of the presidents of the American Veterinary Medical Association, which represents 69,000 veterinarians, were graduates of the MU College of Veterinary Medicine.

The Missouri Veterinary Medical Alumni Association (MVMAA) is centered in the MU College of Veterinary Medicine Dean's Office. Officers are elected by the alumni. The Associate Dean of Student and Alumni Affairs is a permanent member of the Board of the MVMAA. Each autumn, in conjunction with the MVMAA, the MU College of Veterinary Medicine hosts an alumni reunion day. The MU College of Veterinary Medicine currently has the highest percentage of graduates who become members of the MU Alumni Association.

• Middlebush Farm



• Ellis Library



• Technology





### College Publications

The official chronicle of College activities is *Veterinary Medical Review*, a four-color biannual magazine. It is sent to all MU veterinary medical alumni, former faculty, current students, parents of students, friends of the College, and all veterinarians practicing in Missouri.

*Arkeology* is a biannual four-color newsletter that reports the impact of gifts on the College and recognizes students, staff, and faculty for their achievements. It is mailed to MU Veterinary Medical Teaching Hospital clients, alumni, donors, and other interested people.



### College Web Site

The College's main web site is [www.cvm.missouri.edu](http://www.cvm.missouri.edu). Information for prospective and current students can be found at this web site. Current information on the admissions and instructional resources can be found here. The Veterinary Medical Teaching Hospital's web site is located at: [www.vmeth.missouri.edu](http://www.vmeth.missouri.edu). Department and program web sites are accessible from these sites.



### The Administrative Structure

The College has three departments: Biomedical Sciences, Pathobiology, and Veterinary Medicine and Surgery. Also, there is a veterinary diagnostic laboratory, a veterinary medical teaching hospital, and a research farm.

### Administrators

#### Dean

**Associate Dean for Academic Affairs**  
John R. Dodam

**Associate Dean for Research and Postdoctoral Studies** Ronald Terjung

**Associate Dean for Student and Alumni Affairs** Ron K. Cott

**Chair of Veterinary Medicine and Surgery**  
Cecil P. Moore

**Chair of Biomedical Sciences**  
M. Harold Laughlin

**Chair of Veterinary Pathobiology**  
George Stewart

**Director of Student Recruitment and Retention** Barbra A.B. Horrell

**Director of Development** Greg Jones

**Manager of Business and Fiscal Operations** Vicki L. Miller

**Director of the Veterinary Medical Teaching Hospital** Cecil P. Moore

**Director of the Veterinary Medical Diagnostic Laboratory** Alex J. Bermudez

**Director of Research Animal Diagnostic Laboratory** Lela K. Riley

**Director of the Office of Animal Resources** Lon W. Dixon

**Director of Veterinary Continuing Education and Extension**  
Thomas Fangman

**Director of Information Technology**  
Zac March

**Director of Clinical Research** Jeff Tyler

**Director of Undergraduate Studies**  
C.B. Chastain

### Open House



### Large Animal Clinic



### Modern Classrooms



### Orthopedics





## Admission



Admissions criteria may change on a yearly basis—please consult our admissions advisor or the college web site for up to date information

Specialize  
neurology

### Preparation in High School

★ Preparation for applying to the MU College of Veterinary Medicine is best begun while in high school. The selection process for entrance evaluates academic and non-academic criteria.

### Academic Preparation

No fixed requirements exist for the recommended high school curriculum. However, a high school student is generally advised to take four years of mathematics, four years of English (grammar and composition), two years of biology, and as much chemistry and physics as possible. Basic computer skills such as keyboarding and word processing will be very useful. Speech, debating, or drama will also prepare the student for communication skills expected of veterinarians.

### Nonacademic Preparation

Involvement in extracurricular activities, such as school clubs, athletics, band, FFA, 4-H, boy

scouts, girl scouts, church activities, and any other organized activity requiring the development of teamwork, interpersonal skills, and diversity are encouraged and scored for selection purposes.

Applicants are expected to have had experiences observing a variety of animals. Some of this experience must be while observing actual veterinary medical practice. High school students considering veterinary medicine as a career are encouraged to seek out such opportunities to see the actual practice of veterinary medicine. Agricultural, biomedical, research, and public health experience is also highly regarded.

### Requirement for Observation of the Profession

Applicants are required to spend a *minimum of 40 hours* observing one or more veterinarians actively engaged in their normal work environment. Observation must be as a third person, not as a client. (i.e., small or large animal practice, public health, laboratory animal

medicine, or research). The veterinarians observed by the applicant should be among the 4 invited external reviewers.

### Pre-Veterinary Medical Scholars Program

The Pre-Vet Scholars Program provides early assurance of admission to the MU College of Veterinary Medicine to selected students pursuing undergraduate studies at MU. It is open to high school seniors and MU freshman.

Selection is based on meeting eligibility requirements and attaining a satisfactory score from an interview. Selected scholars are assigned faculty mentors and attend case rounds. Scholars also serve as research assistants.

For more information about entry into this program, contact the College's admissions office, or consult the College's web site ([www.cvm.missouri.edu](http://www.cvm.missouri.edu)).

### MU AgScholars Program

This program provides early assurance of admission to the MU College of Veterinary



Medicine to selected students pursuing undergraduate science studies while at MU. Selection is based upon meeting the academic eligibility requirements and attaining a satisfactory score in an interview.

Faculty mentorship, veterinary observation, and agricultural experience are part of this program.

For more information about entry into the AgScholars program, please contact the College's admissions office or consult the College web site.

### Preparation in Undergraduate College

The Admissions Committee accepts credit and grades from any US accredited institution of higher learning. To ensure proper counseling and support, it is advised that undergraduate work be acquired at an institution with an active pre-veterinary medical club.

Students enrolled in the University of Missouri–Columbia are not given preference when applying for admission to the College of Veterinary Medicine unless they have qualified for and are participants in the Pre-Veterinary Medicine Scholars or AgScholars Programs.

### Undergraduate Majors

Since some students interested in becoming veterinarians are not accepted into veterinary medical college, students should emphasize a bachelor's degree program rather than pre-veterinary medical studies. A student should enroll in the school/college offering the degree major selected as a career alternative to veterinary medicine. Most pre-veterinary medical students enroll in animal science, biology, or chemistry.

### Type and Sequence of Undergraduate Courses

Students should be guided by the requirements of their degree majors and our pre-veterinary requirements. Students should consult their advisors about supporting courses and electives which will strengthen their majors.

The following courses and credit hours must be taken in residence at an accredited institution of higher learning to qualify for admission to the College of Veterinary Medicine.

### Semester\* Credit Hours

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

\* Multiply quarter credits by 0.67 to convert to semester credits.

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

Students should take in-depth courses in these areas:

- Inorganic Chemistry courses which prepare them for Organic Chemistry and, finally, Biochemistry;
- Biology Department courses which may be selected from zoology and botany or as required in foundation courses for a biology major.

NOTE: *Courses taken on campuses other than MU in Columbia may not meet the content or degree of subject depth required to apply to the MU College of Veterinary Medicine. Whenever there is doubt as to whether a course will fulfill the requirements to apply, the applicant should contact the Admissions Advisor, MU College of Veterinary Medicine, as soon as possible. If the course is acceptable, the applicant is advised to include a copy of the Associate Dean's response letter with the completed application forms.*

### Three and One Program for BS in Animal Sciences and DVM Degrees

Students who acquire three years of prescribed undergraduate courses in the MU College of Agriculture, Food and Natural Resources, Department of Animal Sciences, and are then successful in being selected to a class in the MU College of Veterinary Medicine will receive elective credits concurrently for up to 32 hours of professional degree courses. This enables qualifying students to receive a BS degree with three years of undergraduate work and one year of professional studies; i.e., BS and DVM degrees in seven years.

### Personal Attributes and Experience Desired

The Admissions Committee feels that applicants should:

- Have experience working with a variety of animal species;
- Be familiar with the veterinary medical profession;
- Be community minded and have demonstrated leadership abilities;
- Be an effective communicator;
- Have developed time and stress management skills;
- Be sincerely motivated; and
- Have realistically evaluated their plans for financing their education.

### Residency

Residency status is determined by the MU Residency Office, not by the College of Veterinary Medicine. Questions concerning residency status should be directed to:

Residency Office  
University of Missouri–Columbia  
123 Jesse Hall  
Columbia, MO 65211  
Phone: (573) 882-3852

Agreements exist with Arkansas and Utah which may reduce tuition for residents of these states. The number of non-resident positions are variable based on annual applicant pools. Consideration is only given to US citizens or holders of permanent alien visas.

For more information, contact:

#### Dr. George W. Jesse

Professor  
S110 Animal Science Center  
University of Missouri  
Columbia, MO 65211  
Phone: (573) 882-2644

#### Dr. John R. Dodam

Associate Dean for Academic Affairs  
W-203 Veterinary Medicine  
University of Missouri  
Columbia, MO 65211  
Phone: (573) 884-6774



# Apply

herd health



## Timetable

July 1 to November 1

On-line applications available.

By October

Non-residents using VMCAS must submit required application.

By November 1

Completed resident applications due and non-resident supplemental applications due.

By February 1

Reference letters, MCAT or GRE scores, and transcripts due. Personal interviews begin.

By April 15

Selection results announced.

By July 1

Grades for all required courses due.

## Standardized Testing

Applicants must submit scores attained within the last three years from the Medical College Admissions Test (MCAT) or the general GRE. A minimum acceptable score on the MCAT is 15 (combined score from the verbal reasoning, physical and biological sciences section) and a 640 (total of verbal and quantitative scores) on the GRE with a 1.5 on the analytical section.

*For MCAT and GRE information:*

### MCAT

P.O. Box 4056  
Iowa City, IA 52243  
[www.aamc.org](http://www.aamc.org)

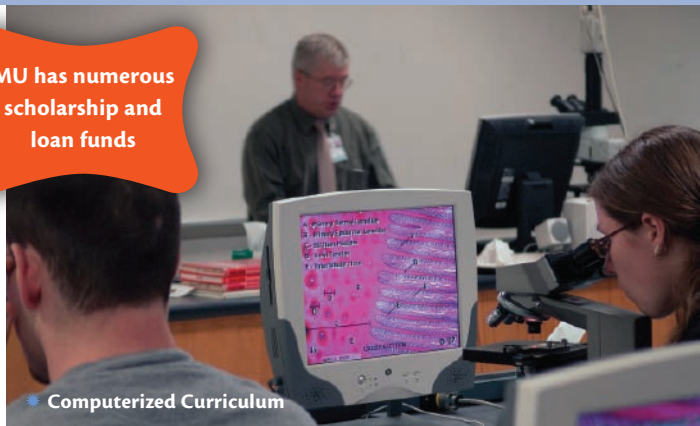
### GRE

[www.GRE.org](http://www.GRE.org)



## Scholarships, Awards, and Aid Programs

MU has numerous scholarship and loan funds



Computerized Curriculum



Oncology

The College and University maintain several programs to assist students finance their educations. More information on these funds is available from the Director of Financial Aid, 11 Jesse Hall, Columbia, Mo. 65211, or the Office of the Associate Dean for Student and Alumni Affairs, W-213 Veterinary Medicine Building, College of Veterinary Medicine, University of Missouri, Columbia, Mo. 65211.

### Loans

★ Students should establish themselves as professional students before applying for money from the funds available to veterinary medicine.

To apply for the Health Professional Loan, Perkins Loan, or the Ford Federal Direct Loan Program (subsidized or unsubsidized student loans), students must complete the Free Application for Federal Student Aid (FAFSA).

- *Health Professions Student Loan Program (HPLV)* loans are federal loans and are borrowed directly from the University of Missouri–Columbia. Eligibility is determined by information the student and his or her parents provides on the FAFSA. The yearly maximum is set by the Student Financial Aid Office, not to exceed financial need. HPL loans have a five percent interest rate and a twelve-month grace period. The Department of Health and Human Services makes the in-school and grace period interest payments. You must include parental financial information on your FAFSA regardless of age, marital status, or dependency status.
- *Perkins Loan* is a federal loan borrowed directly from the University of Missouri–Columbia. Eligibility is determined by the information provided on the FAFSA by the student. The yearly maximum is set by the Student Financial Aid Office, not to exceed the \$6,000 federal allowed maximum. This loan has a five percent interest rate and a nine-month grace period. The Department of Health and Human Services makes the in-school and grace period interest payments.
- *Ford Federal Direct Loan Program-Subsidized Loan (FFDL)* is a loan bor-

rowed from the federal government and is based on eligibility determined by the FAFSA. The yearly maximum is \$8,500, and for new borrowers, the interest rate is fixed at 6.8 percent. The federal government makes the in-school and grace period interest payments. There is a six-month grace period after graduating or dropping below half-time enrollment.

- *Ford Federal Direct Loan Program-Unsubsidized Loan (UFFDL)* is federal loan borrowed directly from the federal government. Eligibility is based on the cost of education. A FAFSA is required. The yearly maximum is \$30,000, plus any amount you did not borrow on the FFDL, or a total maximum of \$38,500 for the two programs. The interest rate for new borrowers is fixed at 6.8 percent. Students are responsible for the in-school and grace period interest payments, but they can be deferred. There is a six-month grace period after graduating or dropping below half-time enrollment.
- *Ford Federal Direct Grad PLUS Loan* is a loan from the US Department of Education (ED) which provides additional funds for educational expenses not met by other types of aid. They enable a graduate/professional student to borrow up to the cost of education minus other aid. For more information please visit the website at [www.sfa.missouri.edu](http://www.sfa.missouri.edu).

For more information about financial aid, contact Ms. Sheila Hawkey-Page, 11 Jesse Hall, University of Missouri, Columbia, Mo. 65211. Phone: 573/882-7506 or 800/225-6075 (in Kansas, Illinois, and Missouri).

### College-Maintained Emergency Loan Program

The College maintains an emergency loan program. Information about these loans is available through the Office of Academic Affairs at the College of Veterinary Medicine.

### College-Maintained Scholarships and Awards

The College maintains several scholarships and awards that are awarded to students each spring during the College's Honors Banquet. In 2006 these awards totaled almost \$300,000. These scholarships are often funded by alumni or friends of the College. More information about these scholarships and awards is available through the Office of the Associate Dean for Student and Alumni Affairs, W-213 Veterinary Medicine Building, College of Veterinary Medicine, University of Missouri, Columbia, Mo. 65211.

### Student Employment

Many students work part-time while attending school. Because of the higher number of classroom and laboratory hours required of veterinary medical students, it is recommended that outside work be kept at a minimum, especially during the first year of the curriculum. Some students are employed on research projects in laboratories and in clinics.

The Veterinary Medical Teaching Hospital has several employment opportunities for students who have an interest in clinical medicine. In addition, the Office of Financial Aid, 11 Jesse Hall, provides information and assistance to students seeking part-time work.



Veterinary medicine students participate in a wide variety of professionally and personally enriching activities at the College



Students, during their four-year educational program, are encouraged to actively engage with the College through programs, leadership opportunities, and social events. These activities not only help the student learn valuable life skills, but bond with their classmates and create lifelong friendships.

**Student Conduct**

★ Honesty is an essential part of professionalism. The Code of Ethics places the responsibility for honor and honesty on the student. Examinations are not closely proctored by faculty members. Drugs and equipment used in clinics and laboratories are made available for instruction with the understanding that the DVM degree candidate will use these materials only for their intended purposes without being policed by faculty members.

The code applies to all students in the MU College of Veterinary Medicine and helps to promote ethical standards of personal and professional conduct among students. Reports of violations of this code are carefully investigated by the Student Honor Committee, and every precaution is taken to arrive at a just decision. A student found guilty of violating the code may be dismissed from the College. Anyone unwilling to accept the responsibility for maintaining the honor code should not

apply for admission to the MU College of Veterinary Medicine. As set forth in the preamble to the MU College of Veterinary Medicine Honor Code, the students of the College have established a code deserving of the high trust and irreproachable conduct demanded by their chosen profession. Details of the Student Honor Code and Academic Regulations can be found in the Student Handbook on the College web site.

★ CVM Crawdad Boil

★ Missouri Mule Team





### Student Chapter of the American Veterinary Medical Association (SCAVMA)

All veterinary medical students are eligible for membership in the Missouri Student Chapter of American Veterinary Medical Association. The student chapter is a divisional arm of Missouri Students Association and functions as the Veterinary Medical Student Council. The chapter sends delegates to the national convention, offers support for members to attend national educational symposiums, and provides numerous benefits for new graduates.

Members of the student chapter of the AVMA elect a president, vice president, secretary, and treasurer who, along with several members of each class, make up the executive council. Committees for the student chapter of the AVMA are appointed by the president.

Benefits of membership include:

- Reduced subscription rate for the Journal of the AVMA.
- Free registration to national AVMA meetings.
- Surgery instrument rental program.
- Free AVMA dues first year after graduation.
- Eligibility for emergency loans through the auxiliary.
- Financial support to attend symposiums and meetings.

### SCAVMA Auxiliary

The SCAVMA Auxiliary is an organization of spouses and significant others of veterinary medical students. Goals are to educate the community about the MU College of Veterinary Medicine, provide moral and social support to student spouses, recognize the importance of the role of the veterinary medical student spouse, promote involvement of spouses with the College, and present a donation in the name of the auxiliary to the students at the annual awards banquet.

### Class Officers

Annually, each class elects a president, vice president, secretary-treasurer, and a class representative. Each class president and the AVMA student chapter president serve on the student advisory council, which meets regularly with the dean, associate dean for academic affairs, and the associate dean for student and alumni affairs to discuss College concerns.

### Student Clubs and Special Interest Organizations



College of veterinary medicine students

have wide and varied interests in the care of animals. They also enjoy a stimulating

social life where they can share their pursuits. The College hosts several animal-related clubs to allow students to engage in further study of veterinary medicine. Subjects include cattle, horses, cats, dogs, swine, zoo medicine, veterinary medical ethics, and zoo medicine. Many of these clubs are affiliated with national organizations.

Other clubs provide service and education to the community. These include a band, mule club, business club, and raptor rehabilitation project.

Other activities include intramural softball, football, soccer, and bowling teams.



### Honor Societies

There are two honor societies at the MU College of Veterinary Medicine.

Phi Zeta is a veterinary honorary society to which third and fourth year veterinary medical students may be elected.

Gamma Sigma Delta is a national organization recognizes students of the Colleges of Agriculture, Food and Natural Resources; Veterinary Medicine; Human Environmental Sciences; and the School of Natural Resources, who have shown exceptional ability during undergraduate or graduate work.

### Graduate Honor Societies

The Rollins Society is the graduate-level organization that recognizes leadership, service, and scholastic achievement.

### Ad-Hoc Committees

One of the largest non-sporting public events on the MU campus is planned and executed by veterinary medical students. The College's annual Open House attracts almost 3,000 visitors who enjoy animal- and health-related exhibits and demonstrations. Students handle logistics, marketing and advertising, crowd control, and coordinating with outside vendors. Students serve as spokespeople to the media, representing themselves, their College, and their profession to the public.

### Other Campus Activities

All students are members of the Missouri Students Association and have a voice in campus affairs. They are offered opportunities to fulfill their responsibilities to the student community through participation in a system of student self-government, with emphasis at the divisional level.

• Dog Jog

• Mizzou Football

• Community Medicine







The DVM degree is achieved after a four-year course of study. At the University of Missouri, the first two years are largely spent in classroom and laboratories with the second two years devoted to clinical study in the MU Veterinary Medical Teaching Hospital and Veterinary Medical Diagnostic Laboratory

# Learn

ultrasound



# anesthesiology

★ **The curriculum** at the University of Missouri College of Veterinary Medicine is designed to provide students with the knowledge and technical skills necessary to be competent entry-level veterinarians. We prepare our students for general veterinary practice, or for entry into graduate or specialty training programs. In addition, we provide students with the background necessary for careers in regulatory medicine.

The first two years of the veterinary curriculum are designed to provide the student with a solid foundation in basic biomedical science. The courses in the preclinical professional curriculum include anatomy, physiology, cell and molecular biology, pathology, pharmacology, microbiology, virology, and toxicology. The fundamentals of the clinical disciplines are also taught during this time and include anesthesiology, clinical pathology, radiol-

ogy, public health, medicine, and surgery.

The organizational structure of the professional curriculum differs from other schools in that the first two academic years are divided into 8-week instructional periods that run from August through and including June. The students have a summer break between the first and second year and second and third year of instruction that is approximately 6 weeks in duration.

Clinical training in the Veterinary Medical Teaching Hospital and the Veterinary Medical Diagnostic Laboratory consists of twelve 6-8 week clinical blocks. Students must complete the following clinical requirements: Food Animal Medicine and Surgery, Equine Medicine and Surgery, Small Animal Medicine (Internal Medicine and Community Practice), Small Animal Surgery (Soft Tissue Surgery, Hard Tissue Surgery, and Neurology/Neurosurgery), Diagnostic Pathology and

Special Species Medicine, Clinical Radiology (1/2 clinical block), Clinical Anesthesiology (1/2 clinical block), Theriogenology (1/3 clinical block), Oncology (1/3 clinical block), and Clinical Ophthalmology (1/3 clinical block). The requirements take a total of 7 clinical blocks to complete.

In addition, students must select elective rotations for a total of two clinical blocks (up to four 3-week rotations). Students may repeat required clinical rotations, or they may choose to participate in elective rotations (cardiology, production medicine, special imaging etc.). In addition to required and elective blocks, students are allotted 3 blocks as 'free' time. Most students utilize their free time to study for licensing examinations, complete preceptorships at practices, or interview with prospective employers. They may also take additional rotations during this time.

The required curriculum results in

● Dentistry

● Outside the Classroom







the accumulation of 160 semester credit hours. Most students graduate with a higher number of credit hours as a result of taking didactic or clinical elective courses.

Applicants seeking admission to the University of Missouri College of Veterinary Medicine should be aware that the professional degree curriculum includes the use of live animals and cadavers in required courses such as laboratories in anatomy, physical diagnosis, and surgery. Some of these use terminal procedures on the animals. In all cases, animals are legally acquired, properly housed, fed, cleaned, and cared for to ensure reasonable comfort and well being. US Department of Agriculture and National Institutes of Health guidelines on animal care and use constitute the minimum basis for the care provided MU animals.

All live animals used in teaching are obtained from sources approved by the US

Department of Agriculture, the governing authority for the humane use of animals in research and teaching in the United States. Procedures performed on these animals must be approved in advance by the MU Animal Care and Use Committee, which comprises faculty from multiple disciplines and includes an at-large member not affiliated with the University. Each procedure is evaluated for evidence of its instructional value, the availability of alternative means of teaching, and the adequacy of pain control. All procedures performed on patients of the Veterinary Medical Teaching Hospital are done with the consent of the animal's owner and in compliance with the standard practice of veterinary medicine.

### Preceptorships

Missouri students may use free blocks for preceptorships to meet requirements of Missouri's Veterinary Medical Practice Act. Preceptorships require the signing of a logbook in the Office of Academic Affairs indicating intent to spend free block time gaining experience in the practice of veterinary medicine under the direct supervision of a licensed veterinarian. Please contact the Missouri Veterinary Medical Board for state preceptorship requirements. The Board, not the MU College of Veterinary Medicine, has the sole discretion as to whether or not a preceptorship qualifies in lieu of a post-graduate internship. The MU College of Veterinary Medicine does not have the authority to approve the use of student free block time or the veterinarians with whom they gain experience.

#### Equine



#### Food Animal



#### Radiology





## A Typical Course Load at the College

### Prefix Codes

VBSC Veterinary Biomedical Sciences  
 VMS Veterinary Medicine and Surgery  
 VPB Veterinary Pathobiology

\* To follow Food Animal Medicine and Surgery, and Theriogenology blocks.

### First Year: Instructional Periods 1-4

#### Period 1

<b>VBSC 5500</b>	Veterinary Anatomy - Part 1 (2.5 credit hours)
<b>VBSC 5502</b>	Veterinary Microscopic Anatomy - Part 1 (1.5)
<b>VBSC 5504</b>	Veterinary Physiology - Part 1 (3)
<b>VBSC 5506</b>	Veterinary Cellular and Molecular Biology - Part 1 (2)

#### Period 2

<b>VBSC 5500</b>	Veterinary Anatomy - Part 2 (2.5)
<b>VBSC 5502</b>	Veterinary Microscopic Anatomy - Part 2 (1.5)
<b>VBSC 5504</b>	Veterinary Physiology - Part 2 (3)
<b>VBSC 5506</b>	Veterinary Cellular and Molecular Biology - Part 2 (2)

#### Period 3

<b>VBSC 5011</b>	Veterinary Anatomy - Part 1 (4)
<b>VBSC 5503</b>	Veterinary Microscopic Anatomy (2)
<b>VBSC 5051</b>	Veterinary Gastrointestinal Physiology (2)
<b>VMS 6140</b>	Veterinary Nutrition (1.5)

#### Period 4

<b>VBSC 5012</b>	Veterinary Anatomy - Part 2 (4)
<b>VBSC 5052</b>	Veterinary Endocrinology & Reproductive Biology (2)
<b>VPB 5511</b>	Veterinary Immunology - Part 1 (1.5) (Same as VPB 4510, Introduction to Immunology)
<b>VPB 5555</b>	Epidemiology and Biostatistics (2) (Same as VPB 4550, Epidemiology and Biostatistics)

### Second Year: Instructional Period 5-9

#### Period 5

<b>VPB 5512</b>	Veterinary Immunology - Part 2 (1.5) (Same as VPB 4510, Introduction to Immunology)
<b>VPB 5552</b>	Veterinary Bacteriology I (2.5)
<b>VPB 5575</b>	General Veterinary Pathology (3)
<b>VPB 5579</b>	Veterinary Genomics (1.5)
<b>VPB 5580</b>	Introduction to Veterinary Informatics (1)

#### Period 6

<b>VPB 5553</b>	Veterinary Bacteriology II (3)
<b>VPB 5554</b>	Veterinary Virology (2) (Same as VPB 4540, Domestic Animal Virology)
<b>VPB 5557</b>	Veterinary Parasitology (3) (Same as VPB 4570, Animal Parasitology)
<b>VPB 5576</b>	Veterinary Systemic and Special Pathology I (3)

#### Period 7

<b>VBSC 5507</b>	Veterinary Pharmacology (3)
<b>VPB 5558</b>	Veterinary Public Health (2) (Same as VPB 4580, Veterinary Public Health)
<b>VPB 5577</b>	Veterinary Systemic & Special Pathology II (3)
<b>VMS 6130</b>	Fundamentals of Veterinary Business Management (1)

#### Period 8

<b>VBSC 5508</b>	Veterinary Pharmacology (2)
<b>VPB 5578</b>	Veterinary Clinical Pathology (3)
<b>VPB 6010</b>	Laboratory Animal Medicine (1.5)
<b>VMS 6020</b>	Veterinary Radiology (2)

#### Period 9

<b>VBSC 5509</b>	Veterinary Toxicology (3)
<b>VMS 6030</b>	Veterinary Anesthesiology (2)
<b>VMS 6040</b>	Companion Animal Medicine (4)
<b>VMS 6060</b>	Small Animal Surgery (2)

☀ Study partners

☀ Hiking





**Third and Fourth Years: Clinical Experience****Instructional Period 10**

<b>VMS 6050</b>	Small Animal Medicine (2.5)
<b>VMS 6071</b>	Small Animal Surgery (2)
<b>VMS 6072 or 6073</b>	Small Animal Surgery and Anesthesia Labs (0.5)
<b>VMS 6081</b>	Food Animal Medicine and Surgery (2.5)
<b>VMS 6151</b>	Equine Animal Medicine and Surgery (2)
<b>VMS 6090</b>	Small Animal Critical Care (1)

**Instructional Period 11 (August-October)**

<b>VMS 6152</b>	Equine Medicine and Surgery (1.5)
<b>VMS 6110</b>	Theriogenology (3)
<b>VMS 6120</b>	Veterinary Ophthalmology (1)
<b>VMS 6082</b>	Food Animal Medicine and Surgery (2)

**Elective Opportunities (up to 2 credit hours may be taken)**

<b>VPB 5991</b>	Introduction to Avian Medicine (1)
<b>VMS 6987</b>	Problem-Based Clinical Preparation (1)
<b>VMS 6989</b>	Advanced Oncology of Companion Animals (1)
<b>VMS 6990</b>	Zoological Medicine (1)
<b>VMS 6991</b>	Advanced Equine Lameness (1)
<b>VMS 6993</b>	Advanced Veterinary Anesthesia (1)
<b>VMS 6994</b>	Advanced Techniques in Small Animal Surgery (1)
<b>VMS 6995</b>	Advanced Didactic Cardiology (1)
<b>VMS 6996</b>	Advanced Dermatology (1)
<b>VMS 6997</b>	Food Animal Diagnostic Exercises (1)
<b>VMS 6998</b>	Small Animal Behavioral Medicine (1)
<b>VMS 6999</b>	Food animal Surgery Lab (1)

**Required Clinical Blocks**

<b>VMS 6400</b>	Food Animal Medicine and Surgery I (6)
<b>VMS 6410</b>	Small Animal Medicine I (6)
<b>VMS 6420</b>	Equine Medicine and Surgery I (6)
<b>VMS 6430</b>	Small Animal Surgery I (6)
<b>VMS 6441</b>	Clinical Radiology I (3)
<b>VMS 6442</b>	Clinical Anesthesiology I (3)
<b>VMS 6450</b>	Theriogenology I (2)
<b>VMS 6460</b>	Clinical Ophthalmology I (2)
<b>VPB 6647</b>	Diagnostic Pathology and Special Species Medicine I (8)
<b>VMS 6490</b>	Small Animal Specialty Medicine I (Oncology; 2)

**Clinical Elective Rotations (12-24 credit hours)**

<b>Electives</b>	
<b>VPB 6676</b>	Laboratory Animal Medicine & Management II
<b>VPB 6678</b>	Epidemiology and Community Health
<b>VPB 6679</b>	Diagnostic Pathology & Special Species Medicine II
<b>VPB 6684</b>	Research Techniques in Veterinary Pathobiology
<b>VMS 6700</b>	Food Animal Medicine and Surgery II
<b>VMS 6710</b>	Small Animal Medicine II
<b>VMS 6720</b>	Equine Medicine, Surgery, or Ambulatory Practice
<b>VMS 6730</b>	Small Animal Surgery II
<b>VMS 6741</b>	Clinical Radiology II
<b>VMS 6742</b>	Clinical Anesthesiology II
<b>VMS 6750</b>	Theriogenology II
<b>VMS 6770</b>	Herd-Health Management and Nutrition II *
<b>VMS 6751</b>	External Food Animal Service and Theriogenology Program
<b>VMS 6800</b>	Clinical Ophthalmology II
<b>VMS 6810</b>	Cardiology II
<b>VMS 6820</b>	Small Animal Emergency and Critical Care
<b>VMS 6830</b>	Food Animal Production Medicine
<b>VMS 6850</b>	Small Animal Specialty Medicine II (Oncology)

☀ Student pet exam

☀ Baby raptor feeding

☀ Oncology





## Academic Regulations



### Schedule and Completion of Required Courses

\* In the first two years, all students are identical, and courses must be successfully completed in sequence. Because pre-clinical courses are offered yearly, academic or hardship issues that prevent a student from completing a course will prolong professional training by one year.

In the final two years of the professional program the student must successfully complete the seven required clinical blocks and two elective clinical blocks in order to fulfill graduation requirements.

It is the prerogative of the veterinary medical faculty to determine the curriculum and to require that such lectures, demonstrations, exercises, and experiences using live animals, cadavers, or clinical patients are important, required, or necessary. To receive the DVM degree, students must pass all required courses. In addition to passing examinations, attendance and participation in all lectures, laboratories, and clinical exercises is necessary.

The doctor of veterinary medicine degree is awarded after successful completion of the professional program.

### Academic Probation

Any student who receives a grade of D in any required course of the professional curriculum and whose cumulative GPA is less than 2.0 will be placed on academic probation. Probation must be removed by the end of the next two successive grading periods.

Any student whose term GPA is less than 2.0 will be placed on academic probation. Probation must be removed by the end of the next successive grading period.

### Dismissal from the College on Academic Grounds

A student who receives a grade of F in any required course of the professional curriculum will be dismissed. Any student failing to remove probation in the prescribed time will be dismissed. Students on academic probation will not be permitted to graduate. Students who accumulate in excess of 9.0 credit hours of "D" grades in the professional curriculum will be dismissed.



## Undergraduate Courses in Biomedical Sciences

In addition to the four-year professional curriculum leading to the Doctor of Veterinary Medicine (DVM) degree, the College offers a variety of undergraduate courses. Currently, the College does not offer a major or minor in any of the departments. However, courses serve as electives for other degree programs and as partial requirements in the Pre-

Veterinary Medicine and AgScholars programs.

MU is a member of the Mid-Missouri Associated Colleges and Universities (MMACU). This is a consortium of MU, Williams Woods University, Stephens College, Westminster College, and Lincoln University. Full-time undergraduate students at the five colleges or universities may take courses for

credit on any of the five campuses. The intent of cross-registration is to support students' educational needs when a desired course is unavailable at the home institution or when there are inherent schedule conflicts. Forms and additional information are available from the MMACU office, 130 Jesse Hall, 573 / 882-6794.

FALL SEMESTER		
<b>BMS 1010</b>	<b>Biomedical Career Explorations</b> (1)	An introductory course for freshmen interested in a career in some aspect of the biomedical sciences.
<b>BMS 2001</b>	<b>Animal Handling and Physical Restraint</b> (2)	Procedures for handling and restraining a variety of animals with emphasis on safety of the animal and its handler.
<b>BMS 2230</b>	<b>Animal Sanitation and Disease Prevention</b> (3)	Preventative measures for disease and parasites of farm animals.
<b>BMS 2420</b>	<b>Inactivity and Disease</b> (2)	Biology of inactivity as a casual factor in chronic disease.
<b>BMS 3219</b>	<b>Elements of Comparative Anatomy</b> (4)	Relationship of organ structure and function in humans and common domestic animals. Bio science credit.
<b>BMS 3310</b>	<b>Equine Health Topics</b> (3)	An in-depth examination of equine health including diseases of continual concern and emerging diseases such as West Nile Virus.
<b>BMS 3326</b>	<b>Veterinary Pharmacology</b> (3)	General principles of pharmacodynamics in domesticated animals. Bio science credit.
<b>BMS 4333</b>	<b>Veterinary Cell Biology</b> (4)	(Same as VBMS 5506 Veterinary Molecular and Cellular Biology.) Course material stresses cell biology as related to animal health and medical issues. Consent of instructor required.
WINTER SEMESTER		
<b>BMS 2110</b>	<b>Biomedical Terminology</b> (3)	Terms commonly used in the life sciences.
<b>BMS 2111</b>	<b>Veterinary Medical Terminology</b> (1)	Medical terms unique to veterinary medicine. Must be taken prior to or concurrent with BIOMED 2110.
<b>BMS 2140</b>	<b>Companion Animals</b> (3)	Focus on companion dog, cat, and horse owner concerns such as health issues, zoonoses, legal responsibilities, inbreeding, choice-of-breeds, behavioral problems, and loss of companion animals.
<b>BMS 2210</b>	<b>Microbiology for Health Sciences</b> (5)	A basic microbiology course for Nursing, Health Related Professions and other interested students. Bio science credit.
<b>BMS 2235</b>	<b>Domestic Animal Behavior</b> (3)	An examination of the normal and abnormal behaviors of companion and farm animals.
<b>BMS 3300</b>	<b>Animal Welfare and Ethics</b> (3)	An examination of contemporary ethical issues related to biomedical science including animal welfare versus rights, agriculture, and cloning. Topics related to animal law issues will also be discussed.
<b>BMS 4310</b>	<b>Basics of Equine Theriogenology</b> (3)	Fundamentals of horse reproduction and common problems of breeding and foaling.
TIME DETERMINED BY INSTRUCTOR		
<b>BMS 3250</b>	<b>Parasitology</b> (4)	Parasites of medical and veterinary importance are discussed as are the principles of parasitism. Bio science credit.
<b>BMS 3335</b>	<b>Techniques in Pathology</b>	Methods and techniques in fixing, preparing, and staining pathological specimens (cr. arr.).
<b>BMS 3347</b>	<b>Clinical Epidemiology and Environmental Health</b>	Ecologic basis of health and cause-effect relationships. Evaluation of control programs. Includes epidemiology of important acute and chronic disease (cr. arr.).



For further information about undergraduate classes offered by the College of Veterinary Medicine see the web site at [www.cvm.missouri.edu/undergrad](http://www.cvm.missouri.edu/undergrad) or contact:

**David T. Cross, DVM, PhD**  
Clinical Assistant Professor  
W-228 Veterinary Medicine Bldg.  
College of Veterinary Medicine  
University of Missouri  
Columbia, MO 65211  
573 / 882-3200 e-mail: [crossdt@missouri.edu](mailto:crossdt@missouri.edu)

**C.B. Chastain, DVM, MS**  
Professor  
W-231 Veterinary Medicine Bldg.  
College of Veterinary Medicine  
University of Missouri  
Columbia, MO 65211  
573 / 882-9594 e-mail: [chastainc@missouri.edu](mailto:chastainc@missouri.edu)



## Graduate Degree and Other Advanced Study Programs



Learn  
 surgery

★ **Graduate education and research** are integral parts of veterinary medical training. Research programs in the MU College of Veterinary Medicine contribute to the advancement of science and significantly enhance the quality of professional education. Participation by students provides a clearer understanding of disease processes, methods of prevention, and treatment of diseases of animals and humans.

Members of the veterinary medical profession, because of their versatility of training, can work in a variety of research areas such as: infectious and noninfectious diseases of livestock, poultry and companion animals, zoonoses (diseases transferred from animal to human), reproductive biology, comparative anatomy, physiology, pharmacology, pathology, neoplasia, laboratory animal medicine, veterinary public health, environmental health, radiation biology, clinical research and drug evaluation, and nutritional studies.

College research projects are supported by federal grants, state funds, foundation

awards and grants, contracts from industries, livestock producer association funds, and money from other groups.

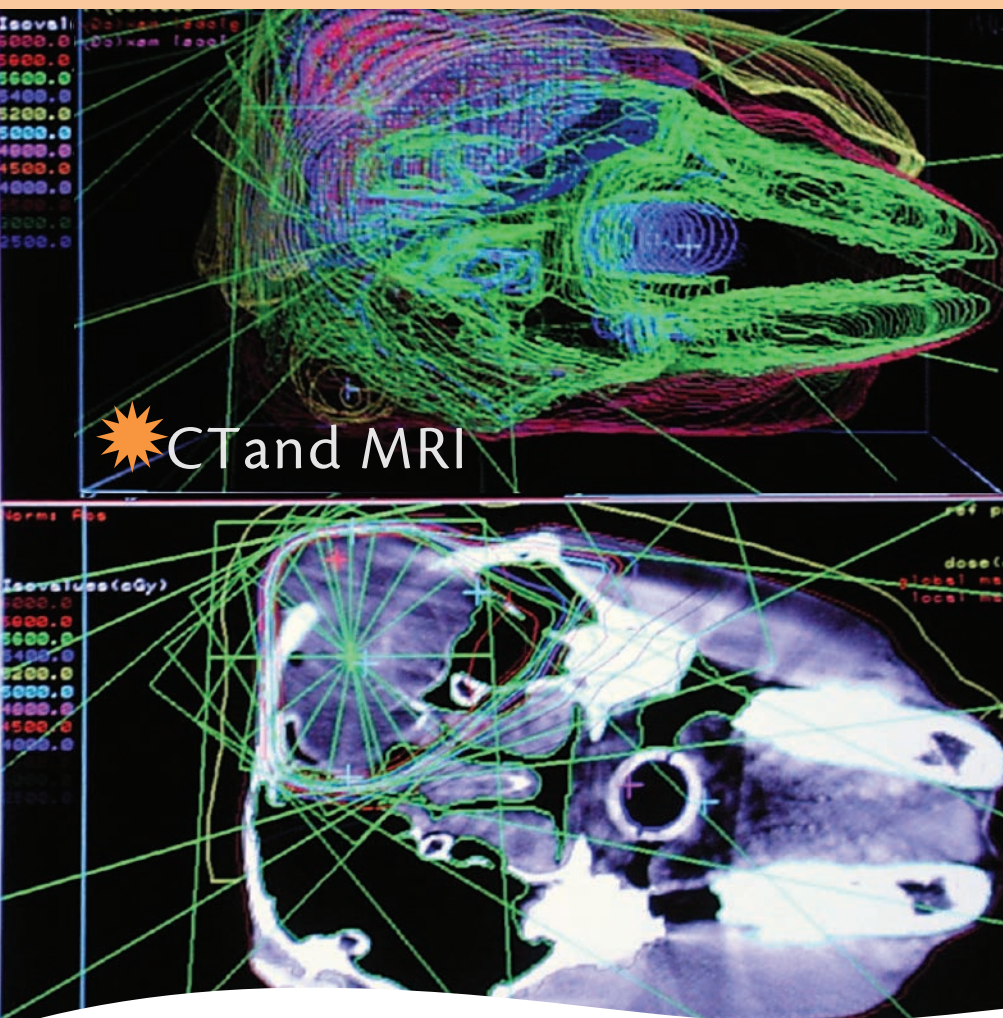
The Department of Veterinary Medicine and Surgery offers graduate training leading to the Master of Science degree through the Veterinary Clinical Sciences Emphasis Area in the Biomedical Sciences Degree Program. The Department's graduate faculty comprises more than 30 members with dynamic and diverse research programs. Research areas include comparative orthopaedics and oncology, food animal, equine, and small animal medicine and surgery, physiology, pharmacology, cell and molecular biology, imaging, neurology, nuclear medicine, ophthalmology, and tissue engineering, among others. Department research projects are supported by federal grants, state funds, foundation awards and grants, corporate grants and contracts, and intramural funds.

The graduate program in Biomedical Sciences offers graduate training leading to the Doctor of Philosophy or the Master of

Science degree. The program in Biomedical sciences provides in-depth, multidisciplinary training to prepare scientists in comprehensive research at the integrative, organ, cellular, and molecular levels. Individuals who successfully complete this program will have diverse backgrounds in state-of-the-art research methodologies and approaches that will make them well-rounded, competitive scientists. Departmental faculty represent a diversity of medical and related basic science disciplines. They provide a rich environment for graduate study and a unique opportunity for training scientists in comprehensive interdisciplinary research. Current faculty interests include cardiovascular, membrane transport, neurohumoral regulation, and reproductive endocrinology.

The Department of Veterinary Pathobiology offers a graduate program leading to a Masters Degree in Biomedical Science or a PhD degree in Area Pathology. The joint MMI/VPB PhD program is presented by the faculty in the departments of





## CT and MRI

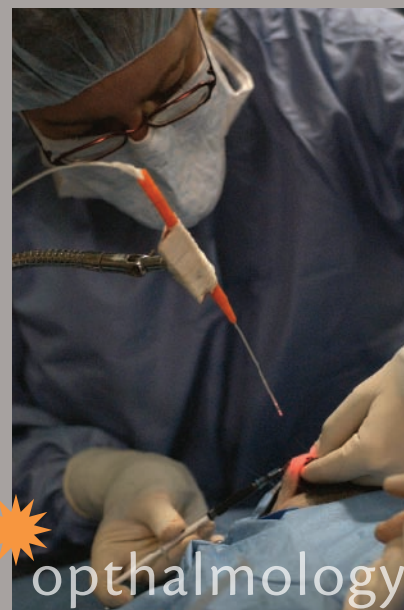
Medical Microbiology and Immunology in the MU School of Medicine and Veterinary Pathobiology in the MU College of Veterinary Medicine. PhD candidates may choose their research areas to take advantage of the interests and specialties of advisers in the departments. Research is conducted in areas such as morphologic alterations in response to disease, ultrastructural and histochemical changes, clinical chemistry, molecular biology, and pathology, all of which are related to host-agent interrelationships in the pathogenesis of disease. Included in these studies are food animals, companion animals, laboratory animals, and some exotic or wild animals.

### Combined DVM/Graduate Degree (Dual) Programs And Leave of Absence

Veterinary Medical Students with a baccalaureate degree and who otherwise qualify for graduate school may take graduate courses during the DVM program when permit-

ted by the DVM schedule and DVM degree requirements. Departments and graduate committees establish specific requirements to achieve graduate degrees. Interested students should contact the Associate Dean for Research and Post-Graduate Studies for further information.

To facilitate progression toward graduate degrees in combined DVM-graduate degree programs, an academic leave of absence for one year to take graduate courses may be requested. The time of absence will typically occur from the end of Instructional Period 7 to the next academic year's Instructional Period 8. Permission is required from the student's graduate program committee and from the Committee on Admissions and Scholarship. Requests for deferment must be received at least six weeks prior to the beginning of Instructional Period 7.



## ophthalmology

### Internships

Internships are available in small animal medicine, equine medicine and surgery, and food animal surgery and production medicine.

### Residency Programs

The College of Veterinary Medicine administers residency training programs through the Veterinary Medical Teaching Hospital, the Veterinary Medical Diagnostic Laboratory, and the Research Animal Diagnostic Laboratory. Available clinical specialty training includes:

- Anesthesiology
- Small Animal Internal Medicine
- Small Animal Surgery
- Equine Medicine
- Equine Surgery
- Food Animal Medicine, Surgery, and Production Medicine
- Food Animal Production and Population Medicine
- Oncology
- Ophthalmology
- Radiation Oncology
- Radiology
- Toxicology
- Pathology
- Cardiology
- Clinical Pathology
- Theriogenology
- Neurology
- Small Animal Emergency Medicine and Critical Care
- Comparative Medicine



## Departments and Courses

## BIOMEDICAL SCIENCES

modern laboratories

computer resources



### Professional Program

Department of Biomedical Sciences faculty play a large role in the early didactic training of our veterinary students. During the first year, Biomedical Sciences Faculty teach gross and microscopic anatomy of food-producing animals, companion animals, and selected laboratory animals. They study normal cell function, tissues, organs and body systems in physiology, and cellular and molecular biology. These studies provide the basis for understanding disease processes and the recognition and treatment of animal diseases.

During the second year, students study pharmacology, which includes actions of drugs and factors influencing the responses of animals to drugs. In the study of toxicology, the student studies disease conditions resulting from poisonous materials including plants, agricultural and industrial chemicals, feed additives, and drugs.

### Graduate Program

The graduate program in Biomedical Sciences offers graduate training leading to the Doctor of Philosophy or the Master of Science degree. The program in Biomedical Sciences provides in-depth, multidisciplinary training to prepare scientists in comprehensive research at the integrative, organ, cellular, and molecular levels. Individuals who successfully complete this program will have diverse backgrounds in state-of-the-art research methodologies and approaches that will make them well-rounded, competitive scientists. Departmental faculty represent a diversity of medical and related basic science disciplines. They provide a rich environment for graduate study and a unique opportunity for training scientists in comprehensive interdisciplinary research.

Department of Biomedical Sciences faculty are committed to the training of research scientists. The research activities of the department address biomedical issues that have a

critical impact on health problems of people and animals. Well-developed research programs evaluate cellular, molecular, and organismal aspects of biomedical problems. Current faculty interests include cardiovascular science, membrane transport, neurohumoral regulation, and reproductive endocrinology.

Departmental faculty maintain research laboratories in the College of Veterinary Medicine and the Dalton Cardiovascular Research Center. State-of-the-art techniques and equipment are used for analysis of biomedical questions at the whole animal, organ, cellular, and molecular levels.

The course curriculum centers on the strategy of developing a multidisciplinary understanding of biomedical research. Core courses include physiology, cell biology, and multidisciplinary approaches to biomedical research. Students also take a minimum of one additional course in each of the areas of molecular biology, cellular biology, and integrative biology.



Biomedical Sciences Course Offerings		
2085	<i>Problems</i> (cr. arr)	Assignment of special problems or topics for training in research.
2222	<i>Fundamentals of Animal Physiology</i> (3)	For students not enrolled in the professional veterinary medical curriculum. Relationship of structure and function in common domestic animals. Study of cells, tissues, organs, and systems.
3326	<i>Veterinary Pharmacology</i> (3)	General principles of pharmacodynamics in domesticated animals.
5011	<i>Veterinary Anatomy I</i> (4)	Detailed study of the macroscopic structure of the domestic ungulates and birds and the Developmental Anatomy of the domestic mammals. All of Biomedical Sciences 5011 and the first 6.5 weeks of Biomedical Sciences 5012 are concerned primarily with: 1) gross anatomy of the horse and ox, especially the anatomic structures of clinical significance; and 2) mammalian developmental anatomy. Clinically significant structures of the other domestic ungulates (pig, sheep, and goat) are also presented, as well as comparative references to the structure of the dog and cat.
5012	<i>Veterinary Anatomy II</i> (4)	Continuation of 5011. The last 1.5 weeks deal with the structure of the domestic birds.
5051	<i>Veterinary Gastrointestinal Physiology</i> (2)	Continuation of 5504. Physiology of the gastrointestinal tract, exocrine pancreas, and liver. Lecture and lab are designed to emphasize principles important to the practice of veterinary medicine.
5052	<i>Veterinary Endocrinology and Reproductive Biology</i> (2)	Continuation of 5051. Comparative endocrinology and reproductive biology.
5500	<i>Veterinary Anatomy</i> (5)	Correlative study of the structure of domestic and laboratory animals in which gross anatomy is emphasized. A segment is devoted to neuroanatomy. Dissection includes the dog, cat, and common laboratory animals.
5502	<i>Veterinary Microscopic Anatomy</i> (3)	Detailed study of the structure and function of the cell, basic tissues (epithelium, connective tissue, nervous tissue, muscle), and several organ systems (cardiovascular, lymphatic, integument, digestive, visual, auditory) of domestic mammals and birds.
5503	<i>Veterinary Microscopic Anatomy</i> (2)	Continuation of 5052. Detailed study of the urinary system, respiratory system, endocrine glands, female reproductive system, placenta, male reproductive system, and integument (hoof and claw) of domestic mammals and birds.
5504	<i>Veterinary Physiology</i> (6)	Physiology of nervous, muscular, circulatory, renal, and respiratory systems. Lecture and lab are designed to emphasize principles important to the practice of veterinary medicine.
5506	<i>Veterinary Cell Biology</i> (4)	A comprehensive overview of molecular and biochemical issues of cell function especially as related to medicine and the underlying molecular causes of disease.
5507	<i>Veterinary Pharmacology</i> (3)	General principles of pharmacy, pharmacokinetics, and pharmacodynamics, with emphasis on drugs affecting the central and autonomic nervous systems, cardiovascular, and hematologic systems.
5508	<i>Veterinary Pharmacology</i> (2)	Continuation of 5507. Antiseptics, autocooids, hemostatics and anticoagulants, fluid and electrolytes, reproductive, endocrine, and gastrointestinal drugs.
5509	<i>Veterinary Toxicology</i> (3)	Local and various systemic clinical responses of domestic animals to foreign chemicals including metals, pesticides, water-and food-borne agents, biotoxins, industrial and plant toxins. The principles, mechanism(s) of action, diagnosis, prevention, and treatment of chemical intoxications are also presented.
7085	<i>Problems</i> (cr. arr)	Assignment of special problems or topics for training in research.
7302	<i>Cytology, Histology, and Organology of Domestic Animals I</i> (3)	Detailed study of the structure and function of the cell, basic tissues (epithelium, connective tissue, nervous tissue, muscle), and several organ systems (cardiovascular, lymphatic, integument, digestive, visual, auditory) of domestic mammals and birds. Prerequisites: graduate standing, background in biological sciences, and instructor's consent.
7303	<i>Cytology, Histology, and Organology of Domestic Animals II</i> (2)	Continuation of 7302. Detailed study of the urinary system, respiratory system, endocrine glands, female reproductive system, placenta, male reproductive system, and integument (hoof and claw) of domestic mammals and birds. Prerequisites: 7302 and instructor's consent.
7307	<i>Embryology and Development of Domestic Animals</i> (2)	Developmental anatomy of domestic animals. Special written report or review required. Prerequisites: background in biological sciences and departmental consent.
7326	<i>Veterinary Pharmacology</i> (3)	General principles of pharmacodynamics in domestic animals.

Note: 5000-6000 level courses are restricted to veterinary medical students. Graduate standing required for all 8000 level courses.



Biomedical Sciences Course Offerings		
7327	<b>Principles of Physiologic Adaptation</b> (3)	Physiologic mechanisms, in individual mammals, in coping with acute and chronic alterations in the physical environment. Pressure, temperature, gravity, and radiation are considered. Prerequisites: four hours of vertebrate physiology or physiological zoology and five hours of chemistry, or instructor's consent.
7333	<b>Veterinary Cell Biology</b> (4)	(Same as Biomedical Sciences 5506). A comprehensive overview of molecular and biochemical issues of cell function especially as related to medicine and the underlying molecular causes of disease.
8010	<b>Comparative Anatomy of the Cardiovascular System</b> (1)	The systemic and pulmonary circulation. The heart and vessels in detail. One midterm exam and final term paper. (8 hrs. lecture and 16 hrs. laboratory).
8085	<b>Problems</b> (cr. arr.)	Selected problems and topics for advanced study in special areas to meet needs of individual students.
8405	<b>Membrane Structure and Function</b> (3)	The structure and function of biological membranes are examined from a biochemical perspective. Topics include membrane proteins, transport, membrane biogenesis, and analytical techniques. Prerequisites: 7333 or equivalent, graduate standing, and instructor's consent.
8409	<b>Advanced Microscopic Anatomy</b> (cr. arr.)	Advanced study of selected topics in vertebrate microscopic anatomy. Special report required. Prerequisite: departmental consent.
8410	<b>Seminar</b> (1)	Presentation and discussion of investigations and topics in anatomy, physiology, or related fields, by qualified students, instructors, and guests. Prerequisite: departmental consent.
8420	<b>Veterinary Physiology</b> (6)	Systemic physiology for graduate students with primary interest in nonhuman mammals. Function of nervous, muscular, circulatory, renal, and respiratory systems. Prerequisites: Biochemistry 4270 and 4272.
8421	<b>Veterinary Physiology</b> (4)	Continuation of 8420. Physiology of the gastrointestinal tract, exocrine pancreas and liver, comparative endocrinology, and reproductive biology. Lecture and lab are designed to emphasize principles important to the practice of veterinary medicine.
8450	<b>Research</b> (cr. arr.)	Open to graduate students with requisite preparation. Research expected to be presented as a thesis.
8490	<b>Research</b> (cr. arr.)	Open to graduate students with requisite preparation. Research expected to be presented as a thesis.
9425	<b>Microvascular Circulatory Function</b> (3)	An in-depth study of microcirculatory structure and function in various tissues, with emphasis on recent developments in the understanding of the mechanisms involved in nutrient supply, edema formation, lymphatic function, and fluid balance. Prerequisites: Veterinary Physiology 8420 and 8421 or Medical Pharmacology and Physiology 8411 or equivalent.
9427	<b>Fate of Drugs in the Animal Body</b> (2)	(Same as Medical Pharmacology and Physiology 9427). Principles concerned with absorption, distribution, excretion, and biotransformation of drugs. Prerequisites: ten hours of physiology, five hours of pharmacology, and five hours of biochemistry.
9431	<b>Control of Energy Metabolism</b> (3)	(Same as Medical Pharmacology and Physiology 9431) This advanced elective is in a lecture/discussion format using primary literature to explore how cells organize and regulate metabolism to meet energy demands. Prerequisite: instructor's consent.
9434	<b>Advanced Clinical Pathology</b> (3)	(Same as Animal Sciences 9434, Gonadal Function). Survey of current and in-depth mechanisms involved in ovarian, testicular, and epididymal function. Emphasis will be given to comparative differences in gonadal functions among domestic animals. Prerequisites: Animal Sciences 4314 (Physiology of Reproduction) or equivalent, a course in endocrinology, and biochemistry or cell biology.
9435	<b>Skeletal Muscle</b> (3)	(Same as Medical Pharmacology and Physiology 9435). Skeletal muscle structure, contraction, mechanics, metabolism, adaptation. Graded on A/F basis only.
9467	<b>Neurohumoral Control of Cardiovascular Function</b> (3)	(Same as Medical Pharmacology and Physiology 9437). Course objectives include developing a general understanding of CNS mechanisms in the regulation of the cardiovascular system, including autonomic, neurohumoral and body fluid homeostatic mechanisms, gaining knowledge of the major advances and topics in the field and becoming familiar with some of the methods used to study CNS cardiovascular regulation. Graded on A/F basis only. Prerequisites: instructor's consent.

Note: 5000-6000 level courses are restricted to veterinary medical students. Graduate standing required for all 8000 level courses.

# VETERINARY PATHOBIOLOGY



## ● oncology laboratory

### *Professional Program*

Courses offered in the microbiology section provide instruction on special properties of pathogenic microorganisms, the host response to invading microorganisms, and techniques for isolation and identification of microorganisms. Special emphasis is placed on the transmission, prevention and control of infectious and parasitic diseases, veterinary community health, epidemiology, and immunology. Lectures, laboratory exercises, special demonstrations, special projects, computer-assisted programs, and problem-based programs are offered.

The primary function of the veterinary pathology section is to teach professional courses in morphologic and biochemical alterations which form the basis for changes that occur in tissues and fluids of diseased

animals. The teaching is conducted in didactic and applied courses. Second year veterinary medical students study general, systemic and special pathology; veterinary clinical pathology; and laboratory animal medicine. The extensive and varied case loads in clinical pathology and Veterinary Medical Diagnostic Laboratory programs are used as teaching resources during the third and fourth years of the professional curriculum.

### *Graduate Program*

The department offers a graduate program leading to the Master of Science degree in biomedical sciences with a specialization in veterinary pathobiology and/or comparative medicine. For admission, the candidate should have completed the DVM or an acceptable baccalaureate degree. Students

should have a GPA of 3.0 on the most recently completed 60 hours of coursework. Further details for requirements of the degree are listed in the Graduate Catalog available through the Graduate School, 205 Jesse Hall, Columbia, Mo. 65211 or online at: <http://gradschool.missouri.edu/requirements.php?adID-107>.

The PhD program in Veterinary Pathobiology is presented by faculty within Area Pathobiology. PhD candidates may choose their research areas to take advantage of the interests and specialties of advisers in the departments. Research is conducted in areas such as veterinary microbiology, immunology, molecular genetics, parasitology, genomics, pathology, toxicology, infectious and parasitic diseases, public health, and laboratory animal medicine.



Veterinary Pathobiology Course Offerings		
2085	<b>Problems</b> (cr. arr.)	Assignment of special topics for research training in veterinary pathobiology. Prerequisite(s): instructor's consent.
2210	<b>Microbiology for Health Sciences</b>	
3085	<b>Problems</b> (cr. arr.).	Prerequisite(s): DVM and departmental consent.
3250	<b>Parasitology</b> (4)	Parasitism is considered a fundamental type of interspecies interaction. Principles of parasitism that apply to humans and animals are presented with emphasis on parasitic morphology, biology, control, and host-parasite relationships. Prerequisite(s): 8 hrs. of biology.
3335	<b>Techniques in Pathology</b> (cr. arr.)	Methods and techniques in fixing, preparing, and staining pathological specimens.
3345	<b>Veterinary and Human Parasitology</b> (4)	Protozoa and helminths of veterinary and human importance; three one-hour lectures, one two-hour lab each week. Advanced undergraduate or graduate standing in biological, veterinary or medical sciences. Prerequisite(s): Biological Sciences 2210 or equivalent and instructor's consent.
3347	<b>Clinical Epidemiology &amp; Environmental Health</b> (1-10)	Ecologic basis of health and disease and cause-effect relationships. Evaluation of control programs. Includes epidemiology of important acute and chronic animal diseases.
5511	<b>Veterinary Immunology</b> (1.5).	(Same as Veterinary Pathobiology 8451). Fundamentals of immunology as applied to domestic animals. Part I Instructional period 4 & 5.
5512	<b>Veterinary Immunology</b> (1.5)	Continuation of 5511. Fundamentals of immunology as applied to domestic animals Part II. Instr. period 4 & 5.
5552	<b>Veterinary Bacteriology I</b> (2.5)	Classification and properties of pathogenic bacteria and fungi of animals; relationship to public health; considers pathogenesis, immunology of infection. Instructional period 5.
5553	<b>Veterinary Bacteriology II</b> (3)	Continuation of 5552. Instructional period 6.
5554	<b>Veterinary Virology</b> (2)	(Same as Veterinary Pathobiology 8454). Classification and properties of viruses. Considers the etiologic, pathologic and immunologic aspects of viral diseases of animals. Prerequisite: enrollment in the College of Veterinary Medicine. Instructional period 6.
5555	<b>Epidemiology and Biostatistics</b> (2)	Instructional period 4. (Same as VPB 8455, Epidemiology and Biostatistics)
5557	<b>Veterinary Parasitology</b> (3)	Instructional period 6. (Same as VPB 8457, Animal Parasitology)
5558	<b>Veterinary Public Health</b> (2)	Instructional period 7. (Same as VPB 8458, Veterinary Public Health)
5575	<b>General Veterinary Pathobiology</b> (3)	Fundamental biochemical and anatomic alterations of disease. Includes disturbances in metabolism, circulation, growth and cell differentiation. Includes the Pathology of Tumors. Instructional period 5.
5576	<b>Veterinary Systemic and Special Pathology I</b> (3)	Pathologic manifestations of disease in the organ systems includes changes caused by infectious agents and metabolic disturbances. Stresses the gross and microscopic criteria by which definitive diagnosis are made. Instructional Period 6.
5577	<b>Veterinary Systemic and Special Pathology II</b> (3)	Continuation of 5576. Instructional period 7.
5578	<b>Veterinary Clinical Pathology</b> (3)	Physiologic basis, interpretation and clinical application of laboratory assays in hematology, chemistry, cytology, and urinalysis, utilization of laboratory methods to define pathological states and diagnose disorders of domestic animals. Prerequisite: enrollment in College of Veterinary Medicine. Instr. period 8.
5579	<b>Veterinary Genomics</b> (1.5)	Instructional period 5.
5580	<b>Introduction to Veterinary Informatics</b> (1)	Instructional period 5.
5991	<b>Introduction to Avian Medicine</b> (1)	
6010	<b>Laboratory Animal Medicine</b> (1.5)	Principles of Veterinary Medicine applied to laboratory animals as pets and in research. Husbandry, handling and clinical techniques, diseases, and use as disease models are discussed. Instr. period 8.
6647	<b>Diagnostic Pathology and Special Species Medicine I</b> (8)	Application of laboratory techniques used to diagnose disease by macroscopic, microscopic, biochemical, microbiologic, and toxicologic findings. Case method of teaching. Domestic avian species and laboratory animals included. Six times yearly.
6676	<b>Laboratory Animal Medicine and Management.</b>	Elective offered 3rd- and 4th-year students, subject to approval of course coordinator and supervising faculty. Concentrated study/experience in laboratory animal disease(s)/colony management. Available to veterinarians as a continuing education program.
6678	<b>Epidemiology &amp; Community Health</b> (2-6)	Elective covering advanced aspects of epidemiology and community health. Emphasizes problem solving and is designed to meet needs of the individual student. Prerequisite: 5558 or instructor's consent.
6679	<b>Diagnostic Pathology and Special Species Medicine II</b>	Third- and fourth-year students. Elective. Approval of coordinator and supervisory staff. Continuation of 6647 with more depth. Available to DVMs as part of continuing education program. Prerequisite: 6647 or equivalent.
6684	<b>Research techniques in Veterinary Pathobiology</b>	
8401	<b>Topics</b> (cr. arr.)	Courses with lectures in various topics in veterinary pathobiology will be given on a trial basis, depending on faculty expertise and student demand. Credit hours are usually one or three. Specialized topics will be covered. Prerequisite(s): instructor's consent.

Veterinary Pathobiology Course Offerings		
8410	<i>Seminar</i> (1)	Discussion of current research methods in veterinary pathology and Air Force Institute of Pathology case studies.
8411	<i>Seminar in Histopathobiology</i> (1)	Discussion of current research and/or case studies in pathology of diseases of domestic animals, laboratory animals and avian species. Team taught.
8421	<i>Advanced Epidemiology</i> (3)	(Same as Family & Community Medicine 8421). w., even years.
8430	<i>Comparative Pathology</i> (3)	Biochemical and morphologic lesions related to the mechanisms of disease expression in plants and animals.
8431	<i>Research Methods &amp; Data Analysis</i> (1-5)	Specific assignments on diagnostic methods including surgical pathology, necropsies, toxicology. Prerequisite(s): departmental consent.
8432	<i>Advanced Histopathology</i> (5)	Advanced microscopic studies of pathological tissues. Prerequisite(s): departmental consent.
8433	<i>Veterinary Oncology</i> (2)	History and molecular biology of neoplasia; laboratory for discussion of practical aspects of diagnosis. Prerequisite(s): graduate standing and instructor's consent.
8434	<i>Advanced Clinical Pathology</i> (4)	Lecture/tutorial teaching; pathogenesis of clinical abnormalities with emphasis on abnormal clinical laboratory test results. Lab: recognition and pathogenesis of abnormalities found via microscopic or other clinical laboratory analysis. Prerequisite(s): departmental consent.
8436	<i>Pathogenic Mechanisms in Veterinary Pathobiology</i> (3)	This course will include disease mechanisms, described at the cellular and molecular level, which result in tissue morphologic (gross and microscopic) and clinical abnormalities. Examples of discussion topics include soluble mediators of inflammatory processes, host-agent interactions, and host defense mechanisms. Prerequisite(s): instructor's consent.
8437	<i>Pathology of Laboratory Animals</i> (4)	Gross and microscopic study of spontaneous and naturally occurring diseases in laboratory animals. Prerequisite(s): departmental consent.
8438	<i>Primatology</i> (3)	Diseases and pathology of primates. Prerequisite: departmental consent.
8441	<i>Topics in Veterinary Pathobiology</i> (1-3)	Subjects appropriate to veterinary pathobiology or epidemiology, taught on a one-time basis or infrequently. May include highly specialized topics. Specific course must be approved by departmental faculty. Prerequisite(s): graduate standing and instructor's consent.
8442	<i>Advanced Veterinary Pathogenic Bacteriology</i> (3)	Study of pathogenic bacteria causing animal disease. Pathogenic mechanisms and host-parasite relationships are emphasized. Laboratory procedures for isolation and identification of pathogens are included. Prerequisite(s): graduate standing and instructor's consent.
8443	<i>Viral Infection and Immunity</i> (3)	Study of virus infection at the level of the intact animal. Includes immunology of domestic animal species. Prerequisite(s): graduate standing and instructor's consent.
8445	<i>Advanced Veterinary Parasitology</i> (3)	Parasitic diseases of domestic and exotic animals and those of public health significance. Prerequisite(s): one course in general parasitology and graduate standing.
8446	<i>Advanced Immunology and Immunopathology</i> (3)	Study of the immune system at the level of the intact animal. Includes a discussion of immunity-infectious diseases. Prerequisite(s): Microbiology 4304 (Immunology), graduate standing and instructor's consent.
8447	<i>Oncogenic Animal Viruses</i> (3)	Biology of RNA and DNA containing animal tumor viruses and their in vitro and in vivo interactions with host cells. Prerequisite(s): 343 or Microbiology 405, or equivalent, general biochemistry or instructor's consent.
8448	<i>Molecular Methods in Nucleic Acids</i> (3)	The course focuses on the most recent developments in technology related to eukaryotic and prokaryotic molecular biology such as analysis and manipulation of nucleic acids and their application to define structure, function, and biosynthesis of macromolecules. Prerequisite(s): instructor's consent.
8450	<i>Non-Thesis Research</i> (cr.arr.)	Research not expected to terminate in dissertation.
8451	<i>Introduction to Immunology</i> (3).	(Same as Veterinary Pathology 5512 & 5551). Fundamentals of immunology as applied to domestic animals.
8452	<i>Cell and Molecular Electron Microscopy</i> (4).	Lecture class that describes the use of electron microscopy (transmission and scanning) in biomedical research. Students receive hands-on experience by completing a laboratory project.
8454	<i>Domestic Animal Virology</i> (2).	(Same as Veterinary Pathobiology 5554). Classification and properties of viruses. Considers the etiologic, pathologic and immunologic aspects of viral diseases of animals. Instructional periods 6 and 7. Prerequisite(s): Instructor's consent.
8455	<i>Epidemiology and Biostatistics</i> (2).	Prerequisite(s): instructor's consent. (Same as VPB 5555)
8457	<i>Animal Parasitology</i> (5).	Prerequisite(s): instructor's consent. (Same as VPB5557)
8458	<i>Veterinary Public Health</i> (2).	Prerequisite(s): instructor's consent. (Same as VPB 5587)
8468	<i>Laboratory Animal Biology</i> (4).	Taxonomy, anatomy, physiology, nutrition and behavior of laboratory animals including non-human primate and less common species are covered. Genetics, gnotobiology, housing and production are also presented. Prerequisite(s): instructor's consent.
8490	<i>Thesis Research</i> (cr.arr.).	Open to graduate students with requisite preparation. Research on specific animal diseases, prevention and treatment. Graded on a S/U basis only.

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## Departments and Courses

## VETERINARY MEDICINE AND SURGERY



✦ small animal surgery

✦ equine internal medicine

### Professional Program

During the third and fourth clinical years of the professional curriculum, students learn to combine the art and science of clinical veterinary medicine and surgery. Two didactic blocks in the VM-3 year provide instruction in clinical subjects not addressed earlier. Practical application of basic principles of medicine and surgery to diagnosis, prevention, and treatment of disease in all animals presents a challenge to the student's mental and physical resources.

Proficiency in clinical medicine is gained by working closely with experienced clinicians in the small animal, food animal, equine, and ambulatory areas of the Veterinary Medical Teaching Hospital. Through the patient-care method of study, professional students are given considerable responsibility for the total health requirements of animals assigned to their care. Discussion periods, formal lectures, rounds, and laboratory training guide the clinical student's progress in systematic medicine and surgery. Broad exposure to clinical practice is gained through curriculum design.

In addition to the required clinical rota-

tions involving care for a spectrum of domestic species, a number of elective experiences are also part of the clinical curriculum.

### Master of Biomedical Sciences

Graduate education and research are integral parts of veterinary medicine. Research programs are needed to provide a better understanding of normal and disease states, and the prevention of diseases of animals and humans. Such efforts contribute to the advancement of biomedical science and significantly enhance animal and human health.

The MU College of Veterinary Medicine offers graduate study leading to the Master of Biomedical Sciences degree in the following areas of specialization: Biomedical (basic) Sciences, Clinical Sciences, Laboratory Animal Medicine and Pathobiology.

If students elect two areas of specialization, they must enroll in appropriate courses to assure competence in both areas.

Candidates must have completed a baccalaureate, DVM, or MD degree.

Completion of the DVM degree is a

prerequisite for admission to the MS degree program in the area of Laboratory Animal Medicine. This program includes residency training and is designed to prepare trainees for board certification, and is the basis for a career in teaching, research, and/or public or private practice.

The MU Graduate School requires that the Graduate Record Examination (GRE) be taken prior to application. Minimum GRE scores for Parts I (Verbal), II (Quantitative), and III (Analytical) are established by the faculty of the area. MU Graduate School acceptance is required of all applicants. The application must include a complete curriculum vitae, a statement of professional and academic goals, three letters of reference, and copies of all university transcripts. The Director of Graduate Studies of each area will evaluate the adequacy of academic records and will act on admission. Prior to acceptance, each applicant must have a major advisor who is a member of the emphasis area.

Veterinary Medicine and Surgery Course Offerings		
1010	<b>Biomedical Career Explorations</b> (1)	An introduction to the variety of career possibilities within the growing field of biomedical sciences. Speakers from various aspects of biomedical sciences will be invited to present opportunities within their respective disciplines. Prerequisite: none. Grading based on S/U basis. Fall semester
2001	<b>Biomedical and Veterinary Medical Terminology</b> (2-3)	Terms commonly used in the life sciences. Winter Semester.
2001	<b>Animal Handling and Restraint</b> (2)	Techniques of handling and restraint of animals that reduce the risk to the handler and stress to animals. Fall Semester.
2140	<b>Companion Animals</b> (3)	Same as Animal Science 2140. Focus on companion dog, cat, horse owners concerns re: health, zoonoses, legal responsibilities, inbreeding, choice of breeds, behavioral problems and loss of companion animals.
2230	<b>Animal Sanitation and Disease Prevention</b> (3)	Preventative measures for disease and parasites of farm animals. Fall only.
2235	<b>Domestic Animal Behavior</b> (3)	An examination of the effects of domestication on the behavior of companion and food animal species. Comparisons to similar animals in feral or wild conditions will be made. The causes, development and potential treatments of abnormal behavior will also be examined. Prerequisite: Biological Science 1500 or equivalent, Sophomore or above. Winter semester.
3219	<b>Elements of Veterinary Anatomy</b> (4)	Introductory comparative gross anatomy of agriculture and other students desiring a basic knowledge of functional comparative anatomy of domestic animals. Prerequisites: five hours of biological science or zoology or equivalent and instructor's consent. Graded on A/F basis only, Fall only.
3300	<b>Animal Welfare and Ethics</b> (1)	An introductory examination of contemporary ethical issues related to biomedical science including animal welfare, agriculture, and cloning.
3310	<b>Equine Health Topics</b> (3)	In-depth examination of equine disease and health topics pertinent to today's horse owner and veterinarian. The course will integrate horse management practices with disease recognition, control and prevention. Prerequisites: Horse Production (Animal Science 325) or equivalent or consent of instructor. Grading based on A/F. Fall Semester.
6000	<b>Problems</b> (cr. arr.)	Studies in specific areas of veterinary medicine and surgery.
6020	<b>Veterinary Radiology</b> (2)	Instructional period 8. Introduces through lectures and demonstrations the principles of radiographic examination and interpretation of disease processes of domestic animals.
6030	<b>Veterinary Anesthesiology</b> (2)	Instructional period 9. Basic principles of anesthesiology for any species of domestic and exotic animals.
6040	<b>Companion Animal Medicine</b> (4)	Instructional period 9. Covers basic principles of veterinary internal medicine and selected sub disciplines.
6050	<b>Small Animal Medicine</b> (2.5)	Instructional period 10. Didactic presentations regarding pathophysiology, diagnosis, and therapeutic management of organ system diseases in small animals.
6060	<b>Small Animal Surgery</b> (2)	Instructional period 9. Basic principles including suture materials and patterns; operative techniques, wound healing of soft tissue surgery.
6071	<b>Small Animal Surgery</b> (2)	Instructional period 10. Continuation of 6060 lectures, focusing primarily on orthopedics.
6072	<b>Conventional Surgery and Anesthesia Laboratory</b> (0.5)	Designed to teach entry-level surgical and anesthesia skills terminal procedures. Instructional period 10.
6073	<b>Fundamental Surgery and Anesthesia Laboratory</b> (0.5)	Instructional period 10. Designed to teach entry-level surgical and anesthesia skills using cadavers and survival spay and neuter procedures. This laboratory is offered as a substitute to VMS 6072 for students with objections to participating in terminal procedure laboratories.
6081	<b>Food Animal Medicine and Surgery</b> (2.5)	Instructional Period 10. Covers the important diseases of cattle, goats, sheep, and swine. Recognition, management and prevention of diseases are stressed.
6082	<b>Food Animal Medicine and Surgery</b> (2)	Instructional Period 11. Continuation of 6081. Covers the important diseases of cattle, goats, sheep, and swine. Recognition, management and prevention of diseases are stressed.
6090	<b>Small Animal Critical Care</b> (1)	Instructional period 10. Basic principles of emergency and critical care of companion animals.
6110	<b>Theriogenology</b> (3)	Instructional period 11. Fundamentals for reproductive function of domestic animals, medical, and surgical management of diseases of reproductive systems.

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Veterinary Medicine and Surgery Course Offerings		
6120	<b>Veterinary Ophthalmology</b> (1)	Instructional period 11. Covers examination, diagnostic procedures, and treatment of important eye diseases of domestic animals.
6130	<b>Fundamentals of Veterinary Business Management</b> (1)	To realistically present to the second-year veterinary student a basic explanation of the essential need for a strong base of knowledge pertaining to business and management in order to successfully operate a veterinary practice.
6140	<b>Veterinary Nutrition</b> (1.5)	Nutrition of companion and food producing animals and nutritional principles important to veterinary medicine. Subjects presented include feeding of animals for maintenance of healthy condition during all life-stages, evaluation of foods and supplements, and methods of diet formulation and evaluation. Grading A/F. Winter Semester.
6151	<b>Equine Medicine and Surgery</b> (2)	Instructional period 10. Covers the fundamentals of diseases of the equine species. Case Management approaches are utilized to provide examples of disease conditions.
6152	<b>Equine Medicine and Surgery</b> (1.5)	Instructional Period 11. Continuation of 6151. Covers the fundamentals of diseases of the equine species. Case Management approaches are utilized to provide examples of disease conditions.
6400	<b>Food Animal Medicine and Surgery</b> (6)	Six times per year. Technical, diagnostic and therapeutic procedures common to the practice of large animal medicine and surgery. Experience in the operation of a large animal hospital and farm outpatient practice.
6410	<b>Small Animal Medicine I</b> (6)	Six times per year. Practical discussion of medical diseases of dogs, cats, and exotic pets as they affect body systems. Practical experience in the operation of a small animal hospital and outpatient practice.
6420	<b>Equine Medicine and Surgery</b> (6)	Six times per year. Technical, diagnostic and therapeutic procedures common to equine practice. Emphasis on fundamental principles.
6430	<b>Small Animal Surgery I</b> (6)	Six times per year. Diagnostic procedures and surgical techniques applicable to companion animal surgery and clinical neurology. Practical experience in the operation of a small animal surgical practice.
6441	<b>Clinical Radiology</b> (3)	Twelve times per year. Fundamentals of radiology: indications for use, techniques, pathophysiologic alterations, interpretation of results, patient aftercare, protective measures against radiation hazards.
6442	<b>Clinical Anesthesiology I</b> (3)	Twelve times per year. Fundamentals of anesthesiology: indications for use, techniques, pathophysiologic alterations, and interpretation of results, patient aftercare.
6450	<b>Theriogenology I</b> (2)	Eighteen times per year. Practical experience in reproductive techniques, obstetrics, breeding soundness, and heard reproductive problems.
6460	<b>Clinical Ophthalmology I</b> (2)	Eighteen times per year. Practical application in problem solving and medical and surgical management of eye conditions of domestic animals.
6490	<b>Small Animal Specialty Medicine I</b> (2)	Eighteen times per year. Clinical rotation in small animal oncology. Taught in the clinical setting using animals presented to the VMTH for evaluation and treatment of oncologic diseases.
6700	<b>Food Animal Medicine and Surgery II</b> (2-6)	Prerequisite: VMS 6400.
6710	<b>Small Animal Medicine II</b> (2-6)	Continuation elective offered to 3rd- and 4th-year students. Opportunity for concentrated study and experience in medical areas. Enrollment subject to approval of course coordinator. Prerequisite: 6410.
6720	<b>Equine Medicine and Surgery II</b> (2-6)	Continuation of VMS 6420. Open to 3rd- and 4th year students, subject to approval of course coordinator. Opportunity for concentration in specific area of interest.
6730	<b>Small Animal Surgery I</b> (2-6)	Prerequisite: VMS 6430 or equivalent. Opportunity for concentrated study and advanced surgical experience.
6741	<b>Clinical Radiology I</b> (2-6)	Continuation of VMS 6441. Elective rotation in small animal or large animal radiology, special imaging, or radiation therapy.
6742	<b>Clinical Anesthesiology I</b> (2-6).	Continuation of VMS 6442. This elective will focus on anesthetizing and monitoring the more challenging anesthetic cases during rotation. Required projects include a review paper on a relevant topic of choice, a written case report and assistance in research activities.

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### Veterinary Medicine and Surgery Course Offerings

6750	<b>Theriogenology II</b> (2-6)	Continuation of the prerequisite VMS 6450. Opportunity for concentrated study and experience. An elective, subject to approval of course coordinator and faculty member(s) who supervise student's work.
6751	<b>External Food Animal Service and Theriogenology Teaching Program (EFAST Teaching Program)</b> (3-6)	Additional options for clinical training in Theriogenology and Food Supply Veterinary Medicine beyond the core curriculum. Winter Semester. Requires 6400 and VM-4 status. Concentrated study/experience in feed lot, dairy, cow/calf, swine herd agribusiness enterprises applicable to veterinary practice.
6800	<b>Clinical Ophthalmology II</b> (2-6)	Opportunity for concentrated study and experience. An elective, subject to approval of course coordinator and faculty member(s) who supervise student's work.
6810	<b>Cardiology</b> (3)	Cardiology elective consists of a three-week clinical rotation in the small animal hospital. Duties include primary case receiving and patient care with clinical case work-up. Additional responsibilities include attendance at clinical rounds and participation in related clinical activities. Students must be currently enrolled in the VM curriculum.
6820	<b>Small Animal Emergency and Critical Care</b> (2-6)	Elective offered to 3rd and 4th year veterinary students. Opportunity for concentrated study and experience in small animal emergency and critical care.
6830	<b>Food Animal Production Medicine</b> (2-6)	This 6-week rotation will focus on the reproductive, metabolic and immunologic physiology of beef, dairy and swine with additional emphasis on spreadsheet and data base applications.
6850	<b>Small Animal Specialty Medicine II</b> (2-6)	Clinical rotation in small animal oncology. Taught in the clinical setting using animals presented to the VMTH for evaluation and treatment of oncologic diseases.
6884	<b>Research Techniques in Veterinary Pathobiology</b> (3)	(Research rotation). Hands-on experience with molecular biology techniques. The student will be required to submit a paper describing the methodologies used, research results, and interpretation.
6987	<b>Problem-Based Learning Clinic Preparation</b> (1)	Didactic elective course offered during instructional period 11. This course is designed to prepare the VM-3 student about to enter clinics for a systematic approach to a clinical case. Emphasis will be placed on developing focused problem, differential lists, and logical choices of diagnostic tests. Fall Semester.
6990	<b>Zoological Medicine</b>	
6991	<b>Advanced Equine Lameness With Lab</b>	
6992	<b>Small Animal Endoscopy</b>	
6993	<b>Advanced Veterinary Anesthesia</b>	
6994	<b>Advanced Techniques in Small Animal Surgery With Lab</b>	
6995	<b>Advanced Didactic Cardiology</b>	
6996	<b>Advanced Dermatology</b>	
6997	<b>Food Animal Diagnostic Exercises</b>	
6998	<b>Small Animal Behavioral Medicine</b>	
6999	<b>Food Animal Surgery Lab</b>	
6989	<b>Advanced Oncology of Companion Animals</b>	
7301	<b>Topics</b> (cr. arr.)	Organized study of select topics. Prerequisites: junior standing and instructor's consent.
7303	<b>Advanced Topics in Veterinary Anesthesia</b> (1)	(Same as VMS 6993.)
7304	<b>Advanced Equine Surgery</b> (2)	The purpose of the course is to aid in the preparation of the resident for Board certification in the American College of Veterinary Surgeons. Prerequisites include a DVM or equivalent degree, acceptance to the graduate school, acceptance to the residency program, and instructor approval.

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Veterinary Medicine and Surgery Course Offerings		
7328	<b>Introductory Radiation Biology</b> (3)	Same as Nuclear Engineering 328, Radiology 328, Biological Sciences 328. Prerequisite: junior standing sciences/engineering: one course in biological sciences and physics/chemistry; or instructor's consent.
7351	<b>Advanced Surgical Techniques</b> (cr. arr.)	Special application to large, small animals. Prerequisite: DVM.
7355	<b>Advanced Techniques in Radiology</b> (cr. arr.)	Special application to domestic animals. Prerequisite: DVM.
7385	<b>Problems</b> (cr. arr.)	Studies in specific areas of veterinary medicine and surgery.
8401	<b>Topics in Clinical Veterinary Sciences</b> (1-3)	Current topics, infrequently-taught courses, or new courses not yet designated by a permanent course number.
8402	<b>Seminars in Veterinary Clinical Sciences</b> (1)	Graduate seminars and conferences with a focus on current literature within a specialty area. Graded on S/U basis only.
8021	<b>Seminars in Veterinary Medicine and Surgery-Neurology Seminar and Journal Review</b> (1)	Weekly journal review and seminar on current topics in veterinary neurology, related clinical disciplines, and basic neurosciences. Prerequisites: DVM degree. Graded on S/U basis only.
8022	<b>Internal Medicine Clinicopathologic Conference</b> (1)	Graded on S/U basis only.
8023	<b>Internal Medicine Journal Review</b> (1)	Graded on S/U basis only.
8024	<b>Medicine-Surgery-Pathology Conference</b> (1)	Graded on S/U basis only.
8025	<b>Equine Medicine Journal Review</b> (1)	Graded on S/U basis only.
8026	<b>Surgery Journal Review</b> (1)	Graded on S/U basis only.
8027	<b>Food Animal Medicine Journal Review</b> (1)	Graded on S/U basis only.
8028	<b>Cardiovascular Medicine Journal Review</b> (1)	Graded on S/U basis only.
8029	<b>Emergency and Critical Care Journal Review</b> (1)	This course will concentrate on review of emergency and critical care literature. Prerequisite: DVM degree. Graded on S/U basis only.
8030	<b>Seminars in Veterinary Medicine and Surgery-Ophthalmology Pathology Seminar</b> (1)	Review of clinical cases presented in two formats: histopathology slides and kodachrome slides. Prerequisite: DVM degree or equivalent and acceptance into an ophthalmology residency program. Graded on S/U basis only.
8031	<b>Seminars in Veterinary Medicine and Surgery-Ophthalmology Seminar and Journal Review</b> (1)	Weekly journal review and seminar on current topics in veterinary ophthalmology, review of pertinent literature in human ophthalmology, and review of ophthalmic texts. Prerequisite: DVM or equivalent degree and acceptance into the ophthalmology residency program. Graded on S/U basis only.
8032	<b>Seminars in Veterinary Anesthesiology</b> (1)	A journal review will focus on advances in veterinary anesthesiology, pharmacology, and physiology. Prerequisites: DVM and graduate school enrollment or instructor's consent. Graded on S/U basis only.
8033	<b>Seminars in Clinical Sciences-Equine Surgery Journal Review</b> (1)	Journal review will focus on advances in equine surgery and will consist of a review of recent manuscripts pertaining to equine surgery in current journals and review of pertinent book chapters. Graded on S/U basis only.
8034	<b>Seminars in Veterinary Radiology</b> (1)	Journal review focusing on advances in veterinary radiology, ultrasound, and alternate imaging. Literature will be reviewed weekly. Prerequisites: DVM & graduate school enrollment (or permission of instructor). Graded on S/U. Winter, Fall, Spring, Summer.
8090	<b>Research</b> (cr. arr.)	(Thesis.)
8405	<b>Comparative Respiratory Pathophysiology</b> (1)	A consideration of clinical pathophysiology of the respiratory system relative to diseases of the thorax and clinical anesthesiology.
8410	<b>Veterinary Medicine and Surgery Research Seminar</b> (1)	Current research in veterinary medicine and surgery. Literature reviews and presentation or original graduate student research. Graded on S/U basis.
8411	<b>Clinical Veterinary Endocrinology</b> (2)	Graduate standing required. A 2-hour course for post-DMV graduate students. It will focus on clinically relevant physiology, pathophysiology, and diagnostic evaluation of hormone systems.

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### Veterinary Medicine and Surgery Course Offerings

8413	<b>Equine Internal Medicine</b> (2)	Prerequisite: DVM degree or equivalent.
8415	<b>Advanced Veterinary Internal Medicine-Neurology</b> (2)	Basic neuroscience as it relates to clinical neurology and the pathophysiology of diseases of the brain, spinal cord, peripheral nerve and muscle in domestic animals. Prerequisites: DVM degree. A/F grading only.
8416	<b>Advanced Veterinary Internal Medicine-Cardiovascular Medicine.</b> (3)	Graduate standing required. Pathologic, pathophysiologic, hemodynamic, and pharmacologic mechanisms of important to the diagnosis, assessment, management, and research of cardiovascular diseases of animals.
8417	<b>Advanced Veterinary Internal Medicine-Clinical Oncology</b> (2)	Provides graduate students in the clinical and basic sciences alike with a working knowledge of the biological mechanisms of cancer development and progression and the related approaches to cancer prevention and therapy. It is assumed that students will have a strong background in biology as a foundation for discussions. Prerequisites: graduate standing; DVM or equivalent degree recommended.
8418	<b>Advanced Veterinary Internal Medicine: Food Animal Medicine</b> (2)	Current concepts in the pathophysiology, diagnosis, and management of medical disorders, diseases of the limbs, and infectious diseases of cattle and food producing animals.
8421	<b>Advanced Veterinary Surgery: Small Animal Surgery</b> (2-4)	Current concepts in the pathophysiology, diagnosis and management of surgical disease of the dog and the cat. Includes laboratories of advanced surgical techniques.
8423	<b>Comparative Arthrology</b> (3)	Lectures and discussion covering anatomy, physiology, biomechanics, pathophysiology, and clinical aspects of mammalian diarthrodial joints.
8425	<b>Advanced Veterinary Surgery: Equine Surgery</b> (2-4)	Current concepts in the pathophysiology, diagnosis, and management of surgical disorders of the horse. Taught yearly as sections A, B, C. Repeatable to a maximum of 10 credit hours (individual sections may be taken once).
8426	<b>Advanced Veterinary Surgery-Ophthalmic Surgery</b> (2-4)	Surgery labs consisting of 2-4 hours of surgical instruction per week. Prerequisite: DVM or equivalent degree and acceptance into the ophthalmology residency program. Graded on A/F basis only.
8431	<b>Research Methods and Data Analysis</b> (2-4)	A consideration of research methods, data analysis, and practical approaches to analyzing data sets derived from veterinary and biomedical studies. (Same as Veterinary Pathobiology 8431.)
8435	<b>Veterinary Clinical Sciences: Clinical Immunology</b> (2)	Advanced concepts in veterinary immunology and immunopathology.
8436	<b>Veterinary Clinical Sciences: Clinical Pharmacology</b> (1)	Advanced concepts in veterinary clinical pharmacology, pharmacokinetics, and anesthesiology.
8437	<b>Advanced Topics in Veterinary Medicine (Nuclear Medicine)</b> (1)	An in-depth review of veterinary nuclear medicine. Includes the physics of nuclear medicine, common imaging techniques, common radiopharmaceuticals, radiopharmaceutical kinetic evaluation, and some common physiological applications. Graduate standing required.
8439	<b>Advanced Veterinary Ultrasonography</b> (2-3)	Advanced concepts in veterinary ultrasonography; including ultrasound and Doppler physics, instrumentation, examination methodology, and interpretation of studies.
8440	<b>Advanced Veterinary Clinical Sciences-Advanced Clinical Ophthalmology.</b> (1-3)	Case-based discussion course. Prerequisite: DVM or equivalent degree and acceptance into the ophthalmology residency program. Graded on A/F basis only.
8445	<b>Veterinary Critical Care and Emergency Medicine</b> (2-3)	Advanced study of veterinary critical care and emergency medicine and surgery focusing on current research and literature as well as clinical application
8450	<b>Research</b> (cr. arr.)	(Non-thesis.) Open to graduate students with requisite preparation.
8485	<b>Problems in Veterinary Clinical Sciences</b> (1-3)	Supervised individuals studies arranged with a faculty member and approved by the advisory committee.
8487	<b>Nuclear Medicine</b> (3)	Principles of radiation detection instrumentation, monitoring radiological safety, and diagnostic procedures used in veterinary nuclear medicine. Prerequisite: one year college physics, DVM degree, and departmental consent.
8488	<b>Radiation Therapy</b> (3)	Prerequisite: one year college physics, DVM degree, and departmental consent.
8489	<b>Veterinary Radiographic Physics</b> (1)	In-depth review in depth of fundamental principles of radiographic physics, with an emphasis on preparation for the American College of Veterinary Radiology Board examination. Prerequisites: DVM and graduate school enrollment (or permission of instructor).

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## Faculty

**Biomedical Sciences**

**M. Harold Laughlin**, PhD, professor and chair; professor, department of physiology, school of medicine; research investigator, Dalton Cardiovascular Research Center (DCRC), MU Curator's Professor

**Ronald L. Terjung**, PhD, professor and associate chair; associate dean for research and post-graduate affairs; professor, department of physiology, Medicine; research investigator, DCRC

**Frank Booth**, PhD, professor; research investigator, DCRC; professor, department of physiology, School of Medicine

**Douglas K. Bowles**, PhD, assistant professor; research investigator, DCRC

**Lane L. Clarke**, DVM, PhD, associate professor; director of graduate studies; research investigator, DCRC

**Gheorghe M. Constantinescu**, DVM, PhD, Dr.h.c., professor

**Ileana A. Constantinescu**, DVM, MS, clinical instructor

**John R. Dodam**, DVM, PhD, associate professor, department of veterinary medicine and surgery, associate dean for admissions

**Brian L. Frappier**, DVM, PhD, clinical associate professor

**Venkateshu K. Ganjam**, B.S., DVM, PhD, professor; research investigator, DCRC

**Marc T. Hamilton**, PhD, assistant professor

**Eileen M. Hasser**, PhD, professor; research investigator, DCRC

**Cheryl M. Heesch**, PhD, associate professor; research investigator, DCRC

**David D. Kline**, PhD, assistant professor

**Cathy Kuehl-Kovarik**, DVM, PhD, assistant professor

**Salman M. Hyder**, associate professor, DCRC

**Pat Porter**, MS, clinical instructor

**Jeffrey T. Potts**, PhD, associate professor

**Elmer M. Price**, PhD, associate professor; research investigator, DCRC

**Chada S. Reddy**, BVSc., PhD, associate professor

**Cheryl S. Rosenfeld**, DVM, PhD, assistant professor

**Leona J. Rubin**, PhD, associate professor; research investigator, DCRC

**James C. Schadt**, PhD, associate professor; research investigator, DCRC

**Richard W. Tsika**, PhD, associate professor; research investigator, DCRC; associate professor, department of biochemistry

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**Wade V. Welshons**, PhD, associate professor

**Steve HT Yang**, PhD, research associate professor

*Adjunct Faculty*

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**Marybeth Brown**, PT, PhD, professor

**Virginia H. Huxley**, PhD, adjunct professor; professor, department of physiology, School of Medicine

**George E. Rottinghaus**, PhD, adjunct associate professor; associate professor, Veterinary Medical Diagnostic Laboratory

**Colette Wagner-Mann**, DVM, PhD, adjunct assistant professor; assistant professor, cardiothoracic surgery, School of Medicine

*Emeriti Faculty*

**Esther M. Brown**, PhD, professor emeritus

**Roger E. Brown**, PhD, professor emeritus

**Homer E. Dale**, DVM, PhD, professor emeritus

**Robert McClure**, DVM, PhD, professor emeritus

**Veterinary Pathobiology**

**George Stewart**, PhD, professor, department chairman

**Yuksel Agca**, DVM, PhD, assistant professor

**Brenda T. Beerntsen**, PhD, assistant professor

**Beth Bauer**, DVM, clinical assistant professor

**Linda Berent**, PhD, clinical assistant professor

**John N. Berg**, DVM, PhD, professor emeritus

**Alex J. Bermudez**, DVM, MS, associate professor, director of VMDL

**Cynthia Besch-Williford**, DVM, PhD, associate professor

**Charles Brown**, PhD, associate professor

**Elizabeth Bryda**, PhD, associate professor

**Michael Calcutt**, PhD, assistant professor

**C. Andrew Carson**, VMD, PhD, professor, director of WHO Collaborating Center for Enteric Zoonoses

**Stan W. Casteel**, DVM, PhD, professor

**John Critser**, PhD, Gilbreath-McLorn Professor of Comparative Medicine

**Dae Young Kim**, DVM, PhD, clinical assistant professor

**Maisie Dawes**, DVM, PhD, clinical instructor

**Timothy J. Evans**, DVM, assistant professor

**William H. Fales**, PhD, professor

**Craig Franklin**, DVM; PhD; associate professor; director of graduate studies, Lab. Animal Medicine (Comparative Medicine)

**Daniel E. Hassett**, PhD, assistant professor

**Gary S. Johnson**, DVM; PhD; professor; director of graduate studies, pathobiology

**Gayle C. Johnson**, DVM, PhD, associate professor

**Robert Livingston**, DVM, PhD, clinical associate professor

**Christian Lorson**, PhD, associate professor

**Zachary March**, MS, clinical assistant professor, director CVM information technology

**William J. Mitchell Jr.**, DVM, PhD, associate professor

**Matthew Myles**, PhD, assistant research professor

**Alpana Ray**, PhD, research associate professor

**Bimal K. Ray**, PhD, professor

**Thomas Reilly**, PhD, clinical assistant professor

**Lela K. Riley**, PhD, professor, director of RADIL

**Audrey Rottinghaus**, MS, instructor

**Heide Schatten**, PhD, associate professor

**Susan Schommer**, DVM, PhD, instructor

**Daniel P. Shaw**, DVM, PhD, professor

**Earl K. Steffen**, PhD, research assistant professor

**Roger W. Stich**, PhD, associate professor

**James R. Turk**, DVM, PhD, professor

**Catherine Vogelweid**, DVM, PhD, associate professor, director of VPB graduate studies

**Eric Walters**, PhD, assistant research professor

**Marlyn Whitney**, DVM, PhD, clinical associate professor

**Charles Wiedemeyer**, DVM, PhD, clinical instructor

**Fred Williams III**, DVM, clinical instructor

*Adjunct Faculty*

**Gary K. Allen**, DVM, PhD, associate professor, director of Bioinformatics Consortium

**William J. Boever**, DVM, adjunct assistant professor

**Brad Bolon**, PhD

**Carmen Chicone**, professor

**Mary Duncan**, adjunct assistant professor

**Gabor Forgacs**, PhD, adjunct professor

**Rick Howard**, DVM, PhD, associate professor

**James Kehler**, VMD, PhD, lecturer

**James Kobayashi**, MD, PhD, professor, chairman of division of organ transplant, Jichi Medical School

**Mark McIntosh**, professor, chair of MMI

**R. Michael Roberts**, PhD, adjunct professor

**Lauren Schultz**, PhD

**David Wildt**, senior scientist, Smithsonian Zoological National Park

*Emeriti Faculty*

**Hans K. Adldinger**, DVM, PhD, professor emeritus

**John N. Berg**, DVM, PhD, professor emeritus

**Harry H. Berrier**, DVM, MS, associate professor emeritus

**Gerald M. Buening**, DVM, PhD, professor emeritus

**Harvey S. Gosser**, DVM, PhD, professor emeritus

**Theodore Green**, PhD, associate professor emeritus

**Reuel R. Hook**, PhD, professor emeritus

**Robert Kahrs**, DVM, PhD, professor and dean emeritus

**Ronald McLaughlin**, DVM, MS, professor emeritus

Lawrence G. Morehouse, DVM, PhD, professor emeritus  
 Bonnard Moseley, DVM, MS, associate professor emeritus  
 Stuart Nelson, DVM, PhD, professor emeritus  
 LeRoy D. Olson, DVM, PhD, professor emeritus  
 Donald Rodabaugh, DVM, MS, professor emeritus  
 Bruce D. Rosenquist, DVM, PhD, professor emeritus  
 Donald A. Schmidt, DVM, PhD, professor emeritus  
 Robert F. Solorzano, MS, PhD, professor emeritus  
 Larry P. Thornburg, DVM, PhD, associate professor emeritus  
 James G. Thorne, DVM, PhD, MPVM, professor emeritus  
 Joseph E. Wagner, DVM, PhD, MPH, professor emeritus

*Graduate Students, Residents, Postdoctoral Fellows, And Research Associates*

Satish Adusumilli, BS  
 Cansu Agca, postdoc  
 Tomoyuki Awano, BS, MS, DVM  
 Ethan Balkin, BS, DVM  
 Travis Baughan, BS  
 Corinna Benson, DVM  
 James Benson, BS  
 Victoria Blaho, BS  
 Lee Breshears, BS  
 Jeffrey Bryan, BS, DVM  
 Paula Butkeraitis, BS  
 Charlette Cain, BS, DVM  
 Jing Chen, BS  
 Xuhua Chen, BS  
 Tristan Coady, BS  
 Lydia Cook, BS  
 Alexa Turner Dixon, BS  
 Michael Drake, BS, DVM  
 Aaron Ericsson, BS, DVM  
 Genevieve Fent, BS, DVM  
 Bridget Garner, BS, DVM  
 Tara Greer-Martin, BS  
 Rangan Gupta, BS, MS  
 Xu Han, postdoc  
 B. Chris Hanks, BS, DVM  
 Andrew Hillhouse, BS  
 Hsin-yeh Hsieh, postdoc  
 Charlie Hsu, BS, DVM  
 Miranda Hvinden, BS  
 Kim Johnson, BS, DVM  
 Mika Katayama, postdoc  
 Bethany Kent, BA  
 Michael Kiriuki, postdoc  
 Eleana Kocher, BS  
 Scott Korte, BS, DVM  
 Kurt Kreutzer, BS, DVM  
 Aric Krogstad, BS, DVM  
 Alexis LaCrue, BS, MS  
 Annie Lai, BS

Hanni Lee, BS, DVM  
 Jill Luther, BS, DVM  
 Thomas Malinski, BS  
 Chris Manuel, BS, DVM  
 Virginia Mattis, BS  
 Jennifer McClure, BS  
 Hongsheng Men, PhD  
 Steve Mullen, BS, MS  
 Cyrille Norotte, BS  
 Hande Odeman-Mercan, PhD  
 Calvin Patten, Jr., BS, DVM  
 Keila Pena-Hernandez, BS  
 Renee Pollard-Roberts, BS  
 Curtis Pritzl, BS  
 Fara Rahmatpana, BS  
 Ferrill Rose, BS  
 Angela Royal, BS, DVM  
 Doug Sanders, BS  
 Maggie Schlarman, BS  
 Arvind Shakya, BS  
 Lindsey Shaw, PhD, postdoc  
 Arvind Shakya, BVS  
 Monir Shabibi, postdoc  
 Janet Simpson, MS  
 Ryan Stoffel, BS, DVM  
 Brian Thompson, BS  
 Emily Vance, BS  
 Armando Villamil, BS, DVM  
 Angela Walker, BS  
 Jennifer Warnock, BS  
 Bettina Weber, BS, DVM  
 Rong Zeng, BS  
 Lin Zhang, BS  
 Zhi-Hseng Zhang, postdoc  
 Chongbei Zhao, BS

#### **Veterinary Medical Diagnostic Laboratory**

Alex J. Bermudez, DVM, MS, associate professor of veterinary pathobiology, diplomate, ACPV, director, Veterinary Medical Diagnostic Laboratory  
 Linda Berent, PhD, clinical assistant professor of veterinary pathobiology  
 Stan W. Casteel, DVM, PhD, professor of veterinary pathobiology, diplomate ABVT  
 Timothy Evans, DVM, assistant professor of veterinary pathobiology; diplomate, ACVP  
 William H. Fales, PhD, professor of veterinary pathobiology, honorary diplomate ACVM  
 Gayle C. Johnson, DVM, PhD, associate professor of veterinary pathobiology; diplomate, ACVP  
 Dae Young Kim, DVM, PhD, clinical professor of veterinary pathobiology, diplomate, ACVP  
 Thomas Reilly, PhD, clinical assistant professor  
 Audrey A. Rottinghaus, MS, instructor in veterinary pathobiology (virology)  
 George E. Rottinghaus, PhD, associate professor of veterinary biomedical sciences (analytical chemistry)

Susan Schommer, PhD, clinical instructor of veterinary pathobiology  
 Daniel P. Shaw, DVM, PhD, professor of veterinary pathobiology, diplomate, ACVP and ACPV  
 Marlyn Whitney, DVM, PhD, clinical associate professor of veterinary pathobiology, diplomate, ACVP  
 Charles Wiedmeyer, DVM, PhD, clinical instructor of veterinary pathobiology, diplomate, ACVP  
 Fred Williams III, DVM, clinical instructor of veterinary pathobiology

#### *Emeriti Faculty*

Harvey Gosser, DVM, PhD, professor emeritus

#### *Residents*

David Garcia-Tapia, anatomic pathology  
 Bridget Garner, DVM, clinical pathology  
 Jennifer Hughes, DVM, anatomic pathology  
 Angelea Royal, DVM, clinical pathology

#### *Graduate Students*

Paula Butkeraitis, MS

#### **Veterinary Medicine And Surgery**

##### *Faculty*

Cecil P. Moore, DVM, MS, Diplomate - ACVO, Professor, Chairman and Hospital Director  
 Robert C. Backus, MS, DVM, PhD, Diplomate - ACVN, Assistant Professor, Director of Nestle Purina Endowed Small Animal Nutrition Program  
 Keith R. Branson, DVM, MS, Diplomate - ACVA, Clinical Assistant Professor (Anes)  
 Lisa Britt, DVM, MS, Diplomate ACVR, Clinical Assistant Professor (RAD)  
 Jeffrey N. Bryan, DVM, MS, PhD, Research Assistant Professor, Comparative Oncology  
 Claud B. Chastain, DVM, MS, Diplomate - ACVIM (Small Animal), Professor, Undergraduate Teaching  
 Joan R. Coates, DVM, MS, ACVIM (Neurology), Associate Professor  
 Leah A. Cohn, DVM, PhD, Diplomate - ACVIM (Small Animal), Associate Professor (SAM)  
 Cristi R. Cook, DVM, MS, Diplomate ACVR, Clinical Assistant Professor (RAD)  
 James L. Cook, DVM, PhD, Diplomate, ACVS, Associate Professor (SAS-Hard Tissue)  
 Ron Cott, DVM, Clinical Assistant Professor and Associate Dean for Student and Alumni Affairs  
 Ross Cowart, P., DVM, MS, Diplomate - ABVP, Associate Professor (FA)  
 David Cross, DVM, PhD, Clinical Assistant Professor (Undergraduate Teaching)



## Faculty

- Craig Datz**, DVM, Diplomate - ABVP, Clinical Assistant Professor (SAM-Community Practice)
- Maisie E. Dawes**, DVM, Clinical Instructor (FA & Anatomy)
- John R. Dodam**, DVM, MS, PhD, Diplomate - ACVA, Associate Professor, Associate Dean for Academic Affairs
- Stephanie Essman**, DVM, MS, Diplomate - ACVR, Assistant Professor (RAD)
- Thomas J. Fangman**, DVM, MS, Clinical Associate Professor, Commercial Agriculture Veterinary Swine Extension Specialist, Director, Middlebush Farm
- Deborah M. Fine**, DVM, MS, Diplomate ACVIM (Cardiology), Assistant Professor (CARD)
- Derek Fox**, DVM, PhD, Diplomate, ACVS, Assistant Professor (SAS - HT)
- V. K. Ganjam**, DVM, PhD, Professor; Professor, Veterinary Biomedical Sciences
- Elizabeth Giuliano**, DVM, MS, Diplomate ACVO, Assistant Professor (Ophtho)
- Carolyn J. Henry**, DVM, MS, Diplomate - ACVIM (Oncology), Associate Professor
- Philip J. Johnson**, BVSc, MRCVS, MS, Diplomate - ACVIM (Equine), Professor (EQ-Med)
- Kevin Keegan**, DVM, MS, Diplomate - ACVS, Associate Professor, Director, E. Paige Laurie Endowed Program in Equine Lameness (SAS)
- Marie E. Kerl**, DVM, Diplomate - ACVIM (Small Animal) and ACVECC, Clinical Associate Professor (SAM and SA ECC) Kramer, Joanne, DVM, Diplomate - ACVS, Clinical Assistant Professor (SAS)
- Joe N. Kornegay**, DVM, MS, PhD, Diplomate - ACVIM (Neurology), Professor and Dean, Investigator, Dalton Research Center
- Joanne Kramer**, DVM, clinical assistant instructor
- Joann Kunz**, DVM, Clinical Instructor (SAM - Community Practice)
- Alison LaCarrubba**, DVM, Clinical Instructor (EQ - Ambulatory)
- Jimmy C. Lattimer**, DVM, MS, Diplomate - ACVR, Associate Professor (RAD)
- Bo Lei**, MD, MSc, PhD, Assistant Professor (Research)
- Michael R. Lewis**, PhD, Assistant Professor (Tumor Biology)
- Tony Mann**, DVM, MS, Diplomate - ACVS, ACVECC, Associate Professor (SAS-ST)
- Dudley L. McCaw**, DVM, Diplomate - ACVIM (Oncology), Professor (Oncology)
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- Nat T. Messer**, DVM, Diplomate - ABVP, Associate Professor (EQ-Med)
- John R. Middleton**, DVM, PhD, Diplomate - ACVIM, Assistant Professor (FA)
- Robert B. Miller**, DVM, MS, PhD, Diplomate - ABVP, Associate Professor; Associate Professor, Vet. Pathobiology, Director, Missouri Cattle Institute
- Dusty W. Nagy**, DVM, MS, Diplomate ACVIM, Assistant Professor (Large Animal)
- Jesse K. Nagy**, DVM, Clinical Instructor (RAD)
- Kristina Narfstrom**, DVM, PhD, Diplomate - European College of Veterinary Ophthalmology (ECVO), Ruth M. Kraeuchi-Missouri Professor in Veterinary Ophthalmology
- Dennis O'Brien**, DVM, MS, PhD, Diplomate - ACVIM (Neurology), Professor
- Scott Poock**, DVM, DABVP - Beef and Dairy, Clinical Assistant Professor, Veterinary Medical Extension, Ruminant Health Veterinary Extension Specialist, Dairy Health Specialist
- Eric Pope**, DVM, MS, Diplomate - ACVS, Associate Professor (SAS-ST)
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- David Senter**, DVM, Diplomate DACVD, Adjunct Clinical Assistant Professor (Dermatology)
- Aaron Stoker**, MS, PhD, Research Assistant Professor, Comparative Orthopaedic Lab.
- Ron Tessman**, DVM, Clinical Instructor (FA)
- James L. Tomlinson**, DVM, MVetSci, Diplomate - ACVS, Professor (SAS-HT)
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- David A. Wilson**, DVM, MS, Diplomate - ACVS, Associate Professor and Associate Chairman for Hospital Affairs (EQ-HT)
- Robert S. Youngquist**, DVM, Diplomate - ACT, Professor and Associate Chairman for Academic Affairs (Theriogenology)
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- Debra F. Horwitz**, DVM, Diplomate - ACVB, Adjunct Assistant Professor
- Rebecca A. Johnson**, PhD, RN, Adjunct Associate Professor, Associate Professor, Sinclair School of Nursing
- Brent D. Jones**, DVM, Adjunct Associate Professor
- Randall E. Junge**, DVM, MS, Adjunct Assistant Professor, Associate Veterinarian, St. Louis Zoological Park
- George G. Keller**, DVM, MS, Adjunct Instructor; Associate Project Director, OFA
- Wayne E. Loch**, MS, PhD, Adjunct Associate Professor; Associate Professor, Animal Science-UMC
- Charles A. Martin**, DVM, MS, Adjunct Assistant Professor, Staff Veterinarian and Swine Specialist, MFA, inc.
- Robert E. Miller**, DVM, Adjunct Assistant Professor, Director, Animal Health and Research, St. Louis Zoological Park
- David A. Senter**, DVM, Diplomate DACVD, Adjunct Clinical Assistant Professor
- Kirk Suedmeyer**, DVM, Adjunct Assistant Professor, Sr. Staff Veterinarian, Kansas City Zoological Gardens
- Debrah L. Turner**, DVM, Adjunct Instructor
- Interns*
- Laura D. Barnes**, DVM
- Jocelyn J. Cooper**, DVM
- Ina L. Hernandez-Lopez**, DVM
- Kristin (Krieket) Konrade**, DVM
- Kristin M. Kultgen**, DVM
- Vengai Mavangira**, BVSc
- Megan E. Moses**, DVM
- Metta J. Renschler**, DVM
- Catherine Tonks**, DVM
- Jarrold M. Vancil**, DVM
- Tige Witsberger**, DVM
- Carly R. Whittall**, DVM
- Residents*
- Michael J. Adkesson**, DVM
- Kathryn Atkinson**, DVM
- David A. Bommarito**, DVM
- Lee A. Breshears**, DVM
- Munashe Chigerwe**, DVM
- David I. Dismukes**, DVM
- Danielle Eifler**, DVM
- Alireza A. Gorgi**, DVM
- Rebecca J. Greer**, DVM
- Michael H. Karagiannis**, DVM
- Stephanie Kottler**, DVM
- Karissa Kaufmann-Ketzner**, DVM
- Tekla Lee**, DVM
- Jill K. Luther**, DVM
- Isabelle Masseur**, M.Sc., DVM
- Juri Ota**, DVM
- Wendi V. Rankin**, DVM
- Steven A. Ringold**, DVM
- Elizabeth K. Schooley**, DVM
- Claire R. Sharp**, Bsc, (BVMS Hons)
- Elizabeth Thomovsky**, DVM
- Jose A. Villamil**, DVM
- Christine L. Vitale**, DVM
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- Jennifer Warnock**, DVM
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- Satish Adusumilli**, DVM







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