College of Veterinary Medicine
Doctor of Veterinary Medicine Degree

University of Minnesota
Driven to Discover™
# College of Veterinary Medicine

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It is an exciting time to join the veterinary profession.

In medicine, science, business, and agriculture, the demand for services has never been higher—and the importance of veterinary medicine has never been greater. Veterinarians care for companion and food animals, protect the public’s health, help protect endangered wildlife, and are often the first responders when we face threats from emerging infectious diseases. They are small-business people, community leaders, neighbors, and friends. Veterinarians truly touch people’s lives every day.

At the University of Minnesota, you will benefit from an innovative curriculum that combines hands-on experience with broad-based medical education. You will work with faculty who are international experts in a variety of areas, including urology, oncology, emerging infectious diseases, food safety, and genomics. You will study with large and small animal clinicians in the University of Minnesota Veterinary Medical Center and other specialized facilities. It’s an opportunity to work with and learn from the best.

You have several degree options: doctor of veterinary medicine (DVM); dual DVM/MPH; dual DVM/PhD; and MS or PhD in basic and clinical sciences. You can care for companion animals, support agribusiness through food animal medicine, advance the conservation of wildlife, or conduct biomedical research. You can go into private practice, join an agribusiness or food company, work for a state or federal agency, or become a scientist. Whatever decisions you make, we will help you make certain they are the best ones for you.

When you are selected for admission to the DVM program or a graduate program, you will join an outstanding class of students taught by a highly respected faculty.

Admission into University of Minnesota programs is highly selective. Each year, the College of Veterinary Medicine admits 102 students into the DVM program from more than 1,000 applications. Our students come from a variety of different backgrounds. Some are admitted directly from undergraduate study, while others decide to pursue veterinary medicine after successful careers in other fields. Together, you and your fellow students constitute the next generation of veterinarians and scientific scholars—making us proud, keeping us healthy.

In these pages, you’ll learn more about the University of Minnesota College of Veterinary Medicine and the opportunities to prepare for a fulfilling career.

Thank you for your interest in the University of Minnesota College of Veterinary Medicine!

We encourage you to visit www.cvm.umn.edu to learn more about the College of Veterinary Medicine. You may write to us at dvminfo@umn.edu or call us at 612-624-4747 with questions about the DVM program. For information on the MS or PhD programs, write to us at cvmmsphd@umn.edu.

The University of Minnesota College of Veterinary Medicine: Why it might be the best choice for you

World-class professional and graduate education

The University of Minnesota College of Veterinary Medicine has a reputation for excellence in both large and small animal medicine and is a leader in the study of infectious diseases, food safety, raptor conservation, and genomics. Established in 1947, the college has graduated more than 3,500 veterinarians and hundreds of scientists. The college is especially well-known for its emphasis on experiential learning and giving students practical experience. Our clinical teaching program gives students hands-on experience in the Veterinary Medical Center, livestock production units in the field, private veterinary practices, public health and animal disease regulatory agencies, and other veterinary medical institutions.
A prestigious university

In 2012, the Academic Ranking of World Universities placed the University of Minnesota at 29th out of more than 1,000 world-class universities and international research institutions surveyed. Also in 2012, the University of Minnesota was ranked 47th out of 400 top research universities in the world by the Times Higher Education world university rankings. The University was ranked ninth among U.S. public research universities and 36th in the world in Newsweek’s most recent “Top 100 Global Universities” report.

An exciting metropolitan setting

The University of Minnesota is home to one of the few veterinary colleges located in a major metropolitan area. Minneapolis and St. Paul provide social and cultural benefits you won’t find elsewhere. No matter what your interests, you’ll find them here—a nationally recognized arts and theater community, a variety of ethnic cultural activities, four glorious seasons of outdoor recreation, professional sports, and restaurants for every taste.

Learning-centered facilities

The college is housed in a complex of interconnected buildings on the St. Paul campus, home to three of the University of Minnesota’s 19 colleges, schools, and centers. Veterinary students study, conduct research, and practice in these buildings, including the Veterinary Medical Center, Veterinary Diagnostic Laboratory, University of Minnesota Leatherdale Equine Center, and Raptor Center.

College of Veterinary Medicine

Innovative education and experiential learning

- An integrated curriculum lets students learn the relationship between the basic sciences and the clinical cases they will see in their practices.
- Students get hands-on experience with animals beginning in the first semester, not only in laboratories but in the Veterinary Medical Center, which has one of the largest caseloads in the country.
- Students develop professional skills in leadership, business, ethics, and other non-technical areas.
- Students practice with trained actors in a mock clinical setting to hone their client communication skills.
- Students choose from five specialized tracks (small animal, equine, food animal, mixed animal, and research/public health).
- Fourth-year students choose from more than 70 rotations, ranging in topics from Acupuncture to Zoological Medicine.
- Students have the opportunity to apply for the DVM/MPH program, a unique and accessible program allowing students to earn doctor of veterinary medicine and master of public health degrees in as little as four years. Students complete field experience in human and veterinary public health and work with advisers to design and present a culminating project.
- The college’s state-of-the-art Dairy Education Center allows students to live and learn at a busy working dairy with up to 6,000 cows. Students can participate in intensive two- to eight-week rotations.
- The college offers service-learning opportunities that allow students to gain clinical skills while learning about the needs of underserved communities, including Native Americans and the urban homeless.
- The Gopher Orientation and Leadership Experience (GOALE) provides an opportunity for students to begin their program by building leadership skills in small groups with faculty mentors.
- The University of Minnesota Leatherdale Equine Center is dedicated to providing world-class education, research, and compassionate patient care.

Cutting-edge research

- When porcine epidemic diarrhea virus (PEDV) was confirmed in the United States swine population, University of Minnesota researchers developed a rapid diagnostic test for PEDV in a few short months. The first-of-its-kind test provided a way to quickly and cost-effectively identify the presence of U.S. PEDV strains, allowing swine producers and farmers to take precautions to prevent further spread.
- The Minnesota turkey industry was attacked by a deadly strain of avian pneumovirus, and college researchers quickly sequenced the genome, devised new diagnostic techniques, and developed a vaccine approved by the USDA.
- College faculty led the team that sequenced the genome of the causative agent of the deadly Johnne’s disease, which affects dairy cattle. This breakthrough opened the door to better diagnostics and preventive vaccines.
- A team of researchers from the Leatherdale Equine Center discovered that a toxin in the seeds of the box elder tree causes seasonal pasture myopathy, a devastating equine muscle disease that is fatal in more than 90 percent of cases.
- When a worldwide outbreak of porcine respiratory and reproductive syndrome devastated the pork industry, a faculty member developed a breakthrough swine vaccine.
- College researchers discovered a gene associated with exercise-induced collapse in Labrador retrievers and developed a test for susceptibility to the debilitating syndrome.
- The possible location of an epilepsy gene has been identified in a dog breed’s specific chromosomal area. Faculty members are working to confirm these data and identify the gene in other breeds.
- Innovative research on brain cancer, osteosarcoma, and other cancers in dogs may also benefit people.
- By studying the underlying causes of urinary stones, the Minnesota Urolith Center is a leader in the development of safe, effective, and affordable methods to dissolve and prevent uroliths.
- A college faculty member’s discovery of the disease polyaccharide storage myopathy, a painful muscle disorder in horses, was named one of the top 10 discoveries of the last decade by Equus magazine.
- A college faculty member co-invented the Gentle Leader, a widely used tool for dog behavior modification. The device was named one of the top 100 inventions of the 20th century by the Smithsonian Institution.

Outstanding programs and resources

- The University of Minnesota Veterinary Medical Center is one of the busiest in the United States, with more than 35,000 small and large animal admissions per year. In addition to basic services, the center offers dentistry, pet behavior modification, oncology, and complementary care.
- The Veterinary Diagnostic Laboratory processes more than 1 million submissions annually from the United States and abroad. The lab is nationally known for its unique molecular diagnostics.
- The Center for Animal Health and Food Safety contributes to the safety and security of the global food system and strengthens our ability to anticipate and respond to threats from animal and food-borne diseases.
- The University’s biosafety level 3 necroscopy laboratory provides a safe working environment in the event of an outbreak of avian influenza virus. It is also used to contain other high-risk zoonotic pathogens associated with diseases such as bovine tuberculosis, bird flu, chlamydiosis, tularemia, anthrax, West Nile virus, and rabies.
- Internationally known for its swine expertise, the college sponsors the annual Leman Swine Conference and Leman China Swine Conference, which attract veterinarians and producers from around the world.
- The college is home to the world-renowned Raptor Center, where students and veterinarians from around the world come to learn about conservation techniques and procedures to rehabilitate injured birds of prey.
- Dedicated to advancing the health, well-being, and performance of the horse, the Leatherdale Equine Center focuses on equine research, veterinary education, and community outreach.
Choosing a degree program

The College of Veterinary Medicine offers the doctor of veterinary medicine (DVM) degree, dual doctor of veterinary medicine/master of public health (DVM/MPH) degree, master of science (MS) degree, doctor of philosophy (PhD) degree in comparative and molecular biosciences or veterinary medicine, and dual doctor of veterinary medicine/doctor of philosophy (DVM/PhD) degree.

DVM

The DVM is a rigorous four-year professional program preceded by three to four years of pre-professional study. During the first three years, you will study the normal animal, the pathogenesis of diseases, and the prevention, alleviation, and clinical therapy of diseases. The program concludes with 13 months of clinical rotations in the Veterinary Medical Center and other sites, during which you will enhance your clinical and professional practice skills. The fourth year includes 6 to 10 weeks of externship experience off-campus sites. Upon receiving your DVM degree, you will be qualified to work as a veterinarian (after licensure), pursue additional training in a specialty, or enter a graduate degree program.

DVM/MPH

The DVM/MPH dual-degree program at the University of Minnesota allows veterinary students to simultaneously earn a DVM and a master of public health degree (MPH, 42 credit hours) in as little as four years. This option allows you to obtain the credentials to work in government or industry on issues related to food safety, emerging infectious diseases, biosecurity, and public health. Here’s how the program works:

- Once admitted to any accredited DVM program, you apply directly to the MPH program (see http://www.sph.umn.edu/programs/vph/).
- Accepted students are encouraged to begin MPH coursework the summer before starting veterinary school and continue during summer breaks through-out veterinary school. The MPH curriculum includes online courses and in-person participation in at least one Public Health Institute held at the University of Minnesota in May. To keep program costs down, a maximum of 14 DVM credits are allowed to be used as part of the MPH degree.
- MPH students complete veterinary and human public health field experience and a “culminating experience” project under the guidance of a faculty adviser.
- The MPH is offered by the School of Public Health, and the tuition costs are separate from those of the College of Veterinary Medicine. All students in the DVM/MPH program pay Minnesota-resident rate tuition.

DVM/PhD

The most significant medical discoveries result from collaboration between the basic sciences and clinical medicine. Clinician scientists, who play a unique role in this process, are skilled in both hypothesis-based research and clinical practice. Our graduates become tomorrow’s leaders in veterinary medicine. We offer a highly competitive formal DVM/PhD curriculum. Through this program, students complete all professional degree requirements, as well as additional graduate study and bench research that are the basis of the PhD thesis. Dual degree candidates must be accepted into the DVM program before consideration for the PhD program. Once accepted, students have two options for completing a dual degree: the concurrent dual-degree option (students pursue the PhD in the middle of their veterinary studies) and the sequential dual-degree option (students complete the DVM degree before starting PhD studies). Financial support is available.

Graduate programs

The college offers you the opportunity to pursue graduate study with master’s and PhD options. The College has two graduate programs, comparative and molecular biosciences and veterinary medicine. The programs draw on the expertise of basic scientific researchers and on the applied research skills and knowledge of board-certified veterinarians.

Comparative and molecular biosciences (CMB) is a multidisciplinary research program in basic and comparative mechanisms of health and disease. It provides students with an understanding of animal disease, animal populations, comparative aspects of biology and pathology across species, and animal models of human disease. The CMB graduate degree prepares you for a career as an investigator in private industry, government, or academia, in areas such as immunobiology and pathology, microbiology and virology, genetics and genomics, cellular and molecular biology, neuroscience, and physiology and pharmacology.

Veterinary medicine (VMED) focuses on basic and applied sciences in the area of animal health. Applied scientific research is utilized to advance understanding of clinical disease in animals. Focus areas of research include infectious disease pathology and diagnostics, population medicine, disease ecology, clinical veterinary specialties, and veterinary and public health. Graduates enter careers in academia, industry, practice, or government service.

Curriculum

- Students and advisors develop an individualized curriculum. Students are required to complete at least one statistics course, an animal research ethics course, and seminar course(s) specific to their program, and to give public research presentations. Students are encouraged to develop their teaching and presenting skills, particularly students planning to enter the academic profession.

Stipends

- All students admitted to a PhD or M5 graduate program receive a competitive stipend, full tuition waiver, and health insurance during their studies. Funding is provided by a variety of sources, including the College of Veterinary Medicine, specific training grants, individual fellowships, and research mentors.

Admissions

- Admission to the graduate programs is competitive and depends upon the applicant’s academic credentials, test scores, prior research and laboratory experience, and the availability of funding for graduate student support. Admission criteria and the online application form can be found at www.cvm.umn.edu/cmb or www.cvm.umn.edu/vmed. The application deadline is December 15.

Alumni

- The college’s graduates have secured positions in various academic, government, and industrial organizations. Institutions such as Northwestern University, Wake Forest University, Yale University, St. Olaf College, Harvard University, Stanford University, and the University of Minnesota have hired the college’s graduates as post-doc scientists, post-doc fellows, and assistant professors. Its alumni work for the U.S. Department of Agriculture, Veteran’s Administration, and Homeland Security. Institutions such as Medtronic, R&D Systems, Jackson Laboratories, Pfizer, and GlaxoSmithKline, Inc. have CMB or VMED graduates leading their research teams.

For information regarding the graduate programs, contact the Graduate Program Office at cvmsphd@umn.edu or call 612-625-1370. The websites for comparative and molecular biosciences (www.cvm.umn.edu/cmb) and veterinary medicine (www.cvm.umn.edu/vmed) contain detailed information about the programs, including application information.
DVM professional program

Preparing for DVM admission
You may be just out of high school when you decide to pursue a career in veterinary medicine, you may already have a couple years of undergraduate work completed, or you may have decided it’s time for a career change. No matter what your situation, it’s helpful to know what’s required for admission before you apply.

High school students
You should begin preparing for your college career by taking as many math and science courses as possible in high school, including biology, chemistry, and physics. Become familiar with the veterinary profession by volunteering or securing paid experience at a veterinary clinic, riding on calls with a large animal veterinarian, working on an animal-related research project with a college professor, or volunteering at a humane society or animal shelter. Then, verify admission requirements with the college or university at which you plan to complete your pre-professional coursework.

Undergraduate students
You may pursue your pre-veterinary studies at any accredited college or university. You may apply to the College of Veterinary Medicine during the academic year in which all of your required pre-veterinary coursework is complete. For most students, this is during senior year; for others, it might be during the third year of college. Nearly 10 percent of students enter the DVM program without completing their bachelor’s degree first.

Interested in food animal medicine?
The VetFAST program addresses a nationwide shortage of food animal veterinarians.

Freshman and sophomore undergraduate students with a strong career interest in food animal medicine who are in the top 25 percent of their high school program at the University of Minnesota Crookston, can complete their bachelor’s degree first. The VetFAST program is designed for students who have scored 25+ on their ACT scores.

Benefits of the VetFAST program include:
• Gain VetFAST program acceptance by the University of Minnesota College of Veterinary Medicine at the end of your freshman or sophomore year in college rather than during your junior or senior year.
• Complete both your bachelor of Science (BS) and doctor of veterinary medicine (DVM) degrees in seven years rather than eight.
• Waive the Graduate Record Exam (GRE) requirement required of the traditional admission process for the DVM program.
• Benefit from mentorships with veterinary faculty and other DVM students.
• Pursue summer veterinary and industry work opportunities through summer internships.
• Obtain scholarships and financial support.

For more details, please visit http://z.umn.edu/cvmvetfast.

DVM application procedure
The application deadline is the first week of October—almost one full year in advance of the first semester for which one enrolls. Please check the website for the exact deadline. The college belongs to the national Veterinary Medical College Application Service (VMCAS), so you may use one application to apply to any of the veterinary colleges belonging to VMCAS. You may submit your application at www.aavmc.org.

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If you have other questions about the application, please review the DVM admissions planning guide online at http://z.umn.edu/dvmpoststudent or contact us at 62-624-4742 or dvminfo@umn.edu.

Evaluating your application
Your application will be evaluated on:
• GPA in required pre-veterinary courses
• GPA for the 45 most recent semester courses
• GRE score – General Test format
• Knowledge of the profession, interest in animals, and professional goals
• Employment experience, communication skills, leadership, and extracurricular activities
• A structured behavioral interview that helps identify whether a career in veterinary medicine is the right choice for you.

Tuition
The cost of a DVM degree is an important financial investment.

Here are the approximate costs for the 2013-2014 academic year.

Resident ................................................................. $33,880
Nonresident ......................................................... $58,346

Books and supplies ............................................. $1,588
Room and board ..................................................... $10,664
Transportation ...................................................... $750
Personal/miscellaneous ....................................... $2,000

Tuition and fees are subject to change without notice.

Tuition/fee figures are based on full-time enrollment each term for the academic year (fall and spring semesters) and includes a $830 student service fee; $3,180 health care coverage fee; $1,050 collegiate fee; $150 capital enhancement fee; $40 transportation fee; $25 stadium fee; $36 Graduate/Professional Student Association fee; and miscellaneous fees. Fourth-year veterinary students pay additional tuition for summer semester. The above expenses do not include living expenses, other incidental expenses, or the nonrefundable tuition deposit of $500. If you enroll, the deposit is applied to your first semester’s tuition. For more information, call the Academic and Student Affairs Office at 612-624-4742 or e-mail dvminfo@umn.edu.

Residency
Minnesota residents receive priority consideration for admission and are charged a lower tuition rate than non-residents who are admitted to the program. To qualify for resident status, you must live in Minnesota for at least one calendar year before the application deadline without enrollment in higher education. For more information, contact One Stop Student Services at http://www.onestop.umn.edu/

Reciprocity
The University has a reciprocity agreement with South Dakota. If you are a resident of South Dakota, you may qualify for reciprocity tuition rates, which are comparable to resident tuition rates. North Dakota residents are covered under a contract arrangement with the University that permits sponsorship of up to five residents of North Dakota in the entering veterinary class at the University. For approved by the North Dakota University System Office, these students pay the equivalent of resident tuition. For more information, contact One Stop Student Services at http://www.onesstop.umn.edu/

Prerequisite coursework
The following coursework is required for admission to the College of Veterinary Medicine.

English composition
6–10 credits of introductory written communication.

Mathematics
3–5 credits of college algebra, pre-calculus, or calculus.

Chemistry (including laboratory)
6–10 credits of general inorganic and 3–5 credits of organic.

Biology (including laboratory)
6–10 credits of introductory sequence in general biology or plant biology, and animal biology.

Physics (including laboratory)
6–10 credits including mechanics, heat, sound, light, electricity, magnetism, and atomic physics.

Biochemistry
3–5 credits including metabolic pathways, cellular energetics, and biosynthesis of cellular constituents.

The course must have an organic chemistry prerequisite.

Genetics
3–5 credits including the mechanics of heredity and their applications.

Microbiology (including laboratory)
3–5 credits of an introductory course including taxonomy, morphology, physiology, and ecology of microbes.

Liberal education
12-16 credits, including four courses from the following areas: anthropology, art, economics, geography, history, humanities, literature, music, political science, psychology, sociology, or theater.
Additional information for DVM students

Student support resources
- Students receive academic advising as well as advising on how to access various college and University resources.
- The Academic and Student Affairs office maintains records on admissions, registration, scholastic standing, and degree requirements.
- The College of Veterinary Medicine and University provide academic support resources to help students maximize their learning.
- Students are provided with opportunities to be considered for scholarships administered by the College of Veterinary Medicine as well as information about how to apply for external scholarships.
- Students can apply for international travel scholarships and have numerous ways to learn about international and cultural opportunities.
- Veterinary professionals can be a tremendous resource for students, so the college offers a formal mentor program for DVM students.
- Career counseling and resume building assistance are available to students throughout the DVM program.

Registration
If you are a DVM student, you will receive complete registration information from the Office of Academic and Student Affairs each term. If you've completed a course or courses similar or identical to those required in the DVM curriculum, you may petition the faculty to substitute for that requirement. Forms for this are available in the Academic and Student Affairs office, 108 Pomeroy Student-Alumni Learning Center. MS and PhD students must register each term according to the requirements of their program and the Graduate School.

Financial aid
Veterinary students may apply for federal Ford loans ($8,500/year limit) and health professions loans (amount based on need) for financial assistance. The University of Minnesota uses the Free Application for Federal Student Aid (FAFSA) as its needs analysis form. Students are encouraged to use the website for the FAFSA application at http://www.fafsa.ed.gov. All applicants to the DVM program are considered independent financial aid filers, and parental income does not play a role in determining financial need, regardless of the applicant's age. The FAFSA website is available after January 1 each year, but students should complete their federal tax return before submitting their FAFSA. The code number for the University of Minnesota is 003269. Financial aid for all veterinary medicine students is administered by the Office of Student Finance, University of Minnesota, 210 Fraser Hall, 106 Pleasant Street S.E., Minneapolis, MN 55455. Second, third, and fourth-year students may also compete for more than $450,000 in awards and scholarships, which are presented at the college's spring awards reception.

Academic calendar
The college and University follow a semester schedule, but the college often has different start and end dates for semesters. For example, the college's spring semester begins in early January, earlier than the nest of the University. For detailed information about the current academic calendar, visit http://z.umn.edu/dvmcalendar.

Equipment
As a DVM student, you will be required to have a laptop computer that meets minimum specifications announced at the time of admission. In addition to a computer and textbooks, you'll need to purchase certain special items of clothing, some medical instruments, and other learning tools.

Policies
Students at the College of Veterinary Medicine are held to college policies as well as University policies. The DVM Student Handbook and selected policies are highlighted on the Student web page at http://z.umn.edu/dvmhandbook.

Grievance procedures
Grievances or appeals may be filed through procedures that conform to the principles of fairness and accessibility defined in the University Senate Statement on Academic Freedom and Responsibility. Grievances must be presented in accordance with the regulations of the University Senate and the procedures established by the college. Grades are determined by the course coordinator and department chair and are not grievable.

Access to student educational records
In accordance with the Regents policy on access to student records, information about a student generally may not be released to a third party without the student's permission. (Exceptions under the law include state and federal educational and financial aid institutions.)

Profile of 2017 successful DVM applicants

Applications ................................................................. 1,031
Resident ................................................................. 217
Nonresident ............................................................ 814
GPA in prerequisite courses (mean) .................... 3.65
GPA in last 45 semester credits (mean) .......... 3.74
GRE Verbal (mean) .................................................. 156
GRE Quantitative (mean) ........................................ 154

Planning your educational program

The College of Veterinary Medicine regularly hosts scheduled information sessions for you to visit campus and learn about the DVM degree program, selection criteria, and application procedures, and to take a tour of the college. To schedule a visit, call the Academic and Student Affairs office at 612-624-4747 or write to dvminfo@umn.edu. If these sessions do not meet your needs or you need more information, we will arrange a meeting with an admissions counselor.
The DVM curriculum

The veterinary curriculum progresses from basic science through applications of that science into clinical medicine, and from knowledge of normal into knowledge of abnormal. Clinical and professional skills and problem-solving are taught throughout. In the third year, you will start to focus, in advanced courses, on the species of most interest to you. The fourth year permits you to put into practice the knowledge, skills, and behavior that you have learned in the classroom. You will choose hands-on rotations that focus on your specific areas of interest.

The college is rolling out a new curriculum for the class of 2017. The classes of 2014-2016 are in a different curriculum, and the outline that follows shows courses by semester for the 2013-2014 academic year. An outline of the curriculum change rollout can be found at http://z.umn.edu/dvmcnriculum.

First year Fall semester

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<tr>
<td>CVM 6000</td>
<td>Orientation to Veterinary Medicine</td>
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<tr>
<td>CVM 6005</td>
<td>Inter-professional Communication and Collaboration</td>
<td>1</td>
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<tr>
<td>CVM 6900</td>
<td>Microscopic Anatomy</td>
<td>4</td>
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<tr>
<td>CVM 6901</td>
<td>Physiology I</td>
<td>5</td>
</tr>
<tr>
<td>CVM 6902</td>
<td>Veterinary Biochemistry, Nutrition and Genetics</td>
<td>3</td>
</tr>
<tr>
<td>CVM 6903</td>
<td>Anatomy I</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6904</td>
<td>Clinical Skills I</td>
<td>1</td>
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<tr>
<td>CVM 6905</td>
<td>Professional Development I</td>
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<tr>
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Plus selected electives from Optional Elective Choices listed on page 12

First year Spring semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>CVM 6006</td>
<td>Critical Scientific Reading</td>
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<tr>
<td>CVM 6007</td>
<td>Professional Development II</td>
<td>2</td>
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<tr>
<td>CVM 6908</td>
<td>Anatomy II</td>
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<td>CVM 6909</td>
<td>Clinical Skills II</td>
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<tr>
<td>CVM 6910</td>
<td>Physiology II</td>
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<tr>
<td>CVM 6911</td>
<td>Immunology</td>
<td>2</td>
</tr>
<tr>
<td>CVM 6912</td>
<td>Basic Pathology</td>
<td>2</td>
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<tr>
<td>CVM 6913</td>
<td>Agents of Disease I</td>
<td>4</td>
</tr>
<tr>
<td>CVM 6914</td>
<td>Preventive Medicine</td>
<td>4</td>
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<td>TOTAL</td>
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Plus selected electives from Optional Elective Choices listed on page 12

Second year Fall semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CVM 6013</td>
<td>Professional Development III</td>
<td>1</td>
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<tr>
<td>CVM 6132</td>
<td>Reproductive Biology</td>
<td>2</td>
</tr>
<tr>
<td>CVM 6142</td>
<td>Veterinary Neuropharmacology</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6202</td>
<td>Infectious Agents: Parasitology</td>
<td>4</td>
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<tr>
<td>CVM 6203</td>
<td>Infectious Agents: Bacteriology</td>
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<td>CVM 6205</td>
<td>Infectious Agents: Pharmacology</td>
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<tr>
<td>CVM 6220</td>
<td>Clinical Epidemiology</td>
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<tr>
<td>CVM 6290</td>
<td>Systemic Pathology</td>
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<tr>
<td>CVM 6303</td>
<td>Clinical Skills III</td>
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<tr>
<td>CVM 6400</td>
<td>Skin and Adnexa</td>
<td>3</td>
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<tr>
<td>CVM 6840</td>
<td>Swine Care</td>
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<td>TOTAL</td>
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Plus selected electives from Optional Elective Choices listed on page 12

Second year Spring semester

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tr>
<td>CVM 6014</td>
<td>Professional Development IV</td>
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<tr>
<td>CVM 6102</td>
<td>Veterinary Imaging</td>
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</tr>
<tr>
<td>CVM 6195</td>
<td>Veterinary Toxicology</td>
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<tr>
<td>CVM 6304</td>
<td>Clinical Skills IV</td>
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<tr>
<td>CVM 6321</td>
<td>Surgery, Anesthesia, Critical Care</td>
<td>4</td>
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<tr>
<td>CVM 6430</td>
<td>Cardiopulmonary System Diseases</td>
<td>4</td>
</tr>
<tr>
<td>CVM 6440</td>
<td>Nervous System Disorders</td>
<td>2</td>
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<tr>
<td>CVM 6444</td>
<td>Ophthalmology</td>
<td>2</td>
</tr>
<tr>
<td>CVM 6460</td>
<td>Urinary Systems Disorders</td>
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</tr>
<tr>
<td>CVM 6480</td>
<td>Obstetrics</td>
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<tr>
<td>CVM 6534</td>
<td>Veterinary Clinical Pathology</td>
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<tr>
<td>CVM 6880</td>
<td>Avian Care</td>
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<tr>
<td>TOTAL</td>
<td></td>
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</tr>
</tbody>
</table>

Plus selected electives from Optional Elective Choices listed on page 12

Licensure requirements

The North American Veterinary Licensing Exam (NAVLE) is given twice per year, once in the fall and again in the spring. Most students take the test in the fall. Passing the NAVLE precedes granting of licensure to practice in any state. Students sit for the boards of the specific state in which they wish to practice and transfer NAVLE scores to the state before beginning practice.

E-mail the University’s official means of communication

Students are responsible for all information sent via their University e-mail account. Students who forward their University e-mail account are still responsible for all information, including attachments, sent to the account.

Equal opportunity

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation. Inquiries regarding compliance may be directed to eoaa@umn.edu or 612-624-9547.
Third year fall semester

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>CVM 6005</td>
<td>Clinical Correlations</td>
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<tr>
<td>CVM 6276</td>
<td>Developing Profound Conversations</td>
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<tr>
<td>CVM 6685</td>
<td>Introduction to Swine Production</td>
<td>5</td>
</tr>
<tr>
<td>CVM 6530</td>
<td>Medical Management of Zoo Animals</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6934</td>
<td>Selected Topics in Zoo Animal Medicine</td>
<td>5</td>
</tr>
<tr>
<td>CVM 6482</td>
<td>Reproductive Diseases of Small Animals</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6685</td>
<td>Small Animal Diagnostic Technique Lab</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6702</td>
<td>Large Animal Palpation Lab</td>
<td>2</td>
</tr>
<tr>
<td>CVM 6704</td>
<td>Reproductive Diseases of Cattle</td>
<td>2</td>
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<tr>
<td>CVM 6727</td>
<td>Equine Palpation Lab</td>
<td>1</td>
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<tr>
<td>CVM 6728</td>
<td>Reproductive Diseases of the Horse</td>
<td>1</td>
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<tr>
<td>CVM 6793</td>
<td>Small Ruminant Reproduction</td>
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<tr>
<td>CVM 6800</td>
<td>Bovine Palpation Lab</td>
<td>1</td>
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</table>

TOTAL | 23 |

In addition, students must choose at least one lecture and one lab from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVM 6702</td>
<td>Large Animal Palpation Lab</td>
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<tr>
<td>CVM 6704</td>
<td>Reproductive Diseases of Cattle</td>
<td>2</td>
</tr>
<tr>
<td>CVM 6727</td>
<td>Equine Palpation Lab</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6728</td>
<td>Reproductive Diseases of the Horse</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6730</td>
<td>Equine Advanced Elective</td>
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<tr>
<td>CVM 6731</td>
<td>Equine Advanced Elective: Surgery</td>
<td>2</td>
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<tr>
<td>CVM 6753</td>
<td>Advanced Equine Elective II</td>
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<tr>
<td>CVM 6790</td>
<td>Advanced Small Ruminant Practicum</td>
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<tr>
<td>CVM 6800</td>
<td>Bovine Reproduction Lab</td>
<td>1</td>
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<tr>
<td>CVM 6801</td>
<td>Advanced Dairy Production Medicine I</td>
<td>1</td>
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<tr>
<td>CVM 6805</td>
<td>Advanced Bovine Practice Lab</td>
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<tr>
<td>CVM 6805</td>
<td>Food and Exotic Large Animal Anesthesia</td>
<td>5</td>
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<tr>
<td>CVM 6841</td>
<td>Swine Behavior</td>
<td>5</td>
</tr>
<tr>
<td>CVM 6860</td>
<td>Food Animal Basics</td>
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Optional elective choices

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CVM 6001</td>
<td>International and Cultural Immersion</td>
<td>5</td>
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<tr>
<td>CVM 6307</td>
<td>Clinical Skills Elective</td>
<td>1</td>
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<tr>
<td>CVM 6481</td>
<td>Obstetrics Lab</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6545</td>
<td>Introduction to Regulatory Medicine</td>
<td>2</td>
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<tr>
<td>CVM 6560</td>
<td>Public Health Issues and Veterinary Medicine Opportunities</td>
<td>1</td>
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<tr>
<td>CVM 6690</td>
<td>Integrative Medicine</td>
<td>2.5</td>
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<tr>
<td>CVM 6718</td>
<td>Community-based Practice Mentoring</td>
<td>1</td>
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<tr>
<td>CVM 6721</td>
<td>Neonatology</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6521</td>
<td>Zoo and Wildlife Round</td>
<td>5</td>
</tr>
<tr>
<td>CVM 6522</td>
<td>Advanced Clinical Epidemiology</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6752</td>
<td>Advanced Equine Elective</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6611</td>
<td>Equine Dentistry Elective</td>
<td>1</td>
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<tr>
<td>CVM 6650</td>
<td>Animals &amp; Society: Interrelationships</td>
<td>2</td>
</tr>
<tr>
<td>CVM 6690</td>
<td>Integrative Medicine</td>
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Third year spring semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CVM 6007</td>
<td>Large Animal Practicum: Year 3</td>
<td>1</td>
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<tr>
<td>CVM 6029</td>
<td>Small Animal Practicum: Year 3</td>
<td>1</td>
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<tr>
<td>CVM 6030</td>
<td>Public Health</td>
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<tr>
<td>CVM 6031</td>
<td>International Diseases</td>
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<tr>
<td>CVM 6494</td>
<td>Small Animal Anesthesia Core</td>
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<tr>
<td>CVM 6495</td>
<td>Nontraditional Pets</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6530</td>
<td>Orientation to Clinical Rotations</td>
<td>1</td>
</tr>
</tbody>
</table>

TOTAL | 8 |

Students can take as many electives as they want in the third-year spring semester.

In addition to the above core classes, students are required to:

- Participate in either a small or large animal hospital practicum.
- Take at least 12 credits from the Required Elective Choices in the spring of their third year.
- Complete 25 clinical rotations (to bring total clinical rotations to 28).

Required elective choices

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CVM 6105</td>
<td>Small Animal Ultrasound</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6136</td>
<td>Small Animal Nutrition Advanced</td>
<td>2.5</td>
</tr>
<tr>
<td>CVM 6206</td>
<td>Small Animal Clinical Skills</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6404</td>
<td>Small Animal Dermatology</td>
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<tr>
<td>CVM 6424</td>
<td>Small Animal Orthopedic Advanced</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6434</td>
<td>Critical Care Advanced Block</td>
<td>1</td>
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<tr>
<td>CVM 6436</td>
<td>Small Animal Cardiology</td>
<td>1</td>
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<tr>
<td>CVM 6442</td>
<td>Small Animal Behavior</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6481</td>
<td>A Clinician’s Analysis of Urinalysis</td>
<td>1</td>
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<tr>
<td>CVM 6484</td>
<td>Small Animal Urinary Systems Disorders</td>
<td>1</td>
</tr>
<tr>
<td>CVM 6471</td>
<td>Small Animal Problems</td>
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Fourth year (summer, fall, and spring)

You’ll begin by selecting a track. Each track has specific requirements.

**Clinical rotations**

Clinical rotations occur in 28 two-week blocks. The rotations include:

- 10 blocks of core clinical courses in medicine, surgery, public health, necropsy, anesthesia, and radiology (required for all tracks)
- 5-2 two-week externships or rotations at other institutions, which occur off campus
- 6 selected rotations based on the track requirements (not required for interdisciplinary track)
- 5-8 elective rotations (or 17 electives for the interdisciplinary track)

All students are required to:

- Participate in either a small or large animal hospital practicum.
- Complete 25 clinical rotations (to bring total clinical rotations to 28).

Elective Choices

- CVM 6842 Reproductive Diseases of Small Animals
- CVM 6493 Reproductive Diagnostic Techniques
- CVM 6497 Avian Medicine and Surgery
- CVM 6610 SA Dentistry & Oral Surgery Elective
- CVM 6681 Advanced Small Animal Theriogenology
- CVM 6685 Small Animal Diagnostic Technique

Optional elective choices

- CVM 6001 International and Cultural Immersion
- CVM 6307 Clinical Skills Elective
- CVM 6481 Obstetrics Lab
- CVM 6545 Introduction to Regulatory Medicine
- CVM 6560 Public Health Issues and Veterinary Medicine Opportunities
- CVM 6690 Integrative Medicine
- CVM 6718 Community-based Practice Mentoring
- CVM 6721 Neonatology
- CVM 6521 Zoo and Wildlife Round
- CVM 6522 Advanced Clinical Epidemiology
- CVM 6752 Advanced Equine Elective
- CVM 6611 Equine Dentistry Elective
- CVM 6650 Animals & Society: Interrelationships
- CVM 6690 Integrative Medicine

- CVM 6105 Small Animal Ultrasound
- CVM 6136 Small Animal Nutrition Advanced
- CVM 6206 Small Animal Clinical Skills
- CVM 6404 Small Animal Dermatology
- CVM 6424 Small Animal Orthopedic Advanced
- CVM 6434 Critical Care Advanced Block
- CVM 6436 Small Animal Cardiology
- CVM 6442 Small Animal Behavior
- CVM 6481 A Clinician’s Analysis of Urinalysis
- CVM 6484 Small Animal Urinary Systems Disorders
- CVM 6471 Small Animal Problems

Advanced Public Health
Clinical Laboratory Medicine
Comparative Anesthesiology
Comparative Ophthalmology
Comparative Radiology
Exotic Animal Medicine
Exotic Animal Necropsy
Laboratory Medicine
Minnesota Zoological Medicine
Necropsy
Radiology: Small and Mixed
Raptor Center
Veterinary Acupuncture
Veterinary Public Health
Veterinary Toxicology

Equine
Equine Ambulatory Rotation
Equine Dentistry and Nutrition
Equine Lameness and Podiatry
Equine Sports Medicine
Equine Theriogenology Introduction
Equine Theriogenology Advanced

Food animal
Advanced Feedlot Herd Health
Advanced Swine Health and Production Introduction
Bovine Surgery
Biosecurity Containment for Food Animals
Carnivore Medicine, Surgery, Reproduction, and Health
Cow-Call Herd Production
Dairy Herd Health
Dairy on Farm Clinical
Dairy Production Medicine I, II, III, IV
Dairy Theriogenology Palpation
Directed Studies in Dairy Production Medicine
Food Animal Disease and Diagnostics
Fresh Doe and Goat Kid Management
Introduction to Swine Health and Production
Miracle of Birth
Overview of Dairy Production Medicine
Population Diagnostics and Therapeutics
Poultry Medicine Clerkship
Small Ruminant Health and Production
Swine Health and Production Advanced
Swine Disease Diagnostics, Therapeutics, and Prevention

Large animal
Large Animal Medicine
Large Animal Surgery and Lameness

Other
Directed Studies–Diagnostic Medicine
Directed Studies–Large Animal
Directed Studies–Pathobiology
Course descriptions

Course Symbols

\[\ldots\] The comma, used in prerequisite listings, means “and.”

\$... Credit will not be granted if credit has been received for the course listed after this symbol.

\(\ldots\) Concurrent registration is required (or allowed) in the course listed after this symbol.

\#... Approval of the instructor is required for registration.

\(\ldots\) Approval of the department offering the course is required for registration.

\(\ldots\) Approval of the college offering the course is required for registration.

A prerequisite course listed by number only (e.g., Prereq 5246) is in the same department as the course being described.

College of Veterinary Medicine (CVM)

CVM 6001 Opportunities in International and Cultural Immersion (5 cr [max 1 cr]; S-N only) Finding and applying for opportunities. Securing funding. Travel safety. Topics in cultural competence. Presentations from students who have participated in international projects.

CVM 6003 Clinical Correlations (2 cr; S-N only yr students) Case-based review of common problems in veterinary medicine. Preparation for clinical year of training/board review. Three variations of course.

CVM 6005 Interprofessional Ethics Education (1 cr [max 2 cr]; S-N only. Prereq AHC student) Introduction to concepts/methods in health care ethics through online modules. Facilitated interprofessional small-group discussions of case narratives. Concepts/methods that are relevant across health professions.

CVM 6013 Professional Development III (2 cr; S-N only. Prereq-DVM 2nd yr or #) Growth of veterinary professional within the larger community. Developing communication skills. Working with the elderly and children. Participation/observation at veterinary practice.

CVM 6014 Professional Development IV (2 cr; S-N only. Prereq-DVM 2nd yr or #) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.


CVM 6027 Large Animal Practicum: Year 3 (1 cr; S-N or Aud. Prereq 3rd DVM or [4, 0]) Experience in procedures/policies involved in after-hours care of hospitalized/emergency cases in the Large Animal Hospital.

CVM 6028 Large Animal Hospital Practicum: Year 4 (4 cr [max 12 cr]; S-N or Aud. Prereq-Required for all 4th year students in Large Animal Track) Experience in team leadership in procedures/policies involved in after-hours care of hospitalized/emergency cases in Large Animal Hospital.

CVM 6030 Veterinary and Community Public Health (2 cr; A-F or Aud. Prereq-6202, 6210) Epidemiological approach to veterinary public health. Major zoonoses, animal sentinels, meat/milk inspection, preharvest food safety, environment, occupational health/safety, euthanasia, carcass disposal methods, cruelty investigations, welfare issues. Problem-solving examples.

CVM 6031 International Animal Diseases (1 cr [max 2 cr]; S-N or Aud. Prereq-DVM, [CVM grad student or #]) Epidemiology, clinical signs, differential diagnoses, pathology, economic effect of diseases not currently or intermittently present in the United States. International role of veterinarians in controlling disease, increasing food production, facilitating trade.

CVM 6042 Practice Management/Law and Ethics (2 cr; S-N or Aud. Prereq-DVM or #) Economic, marketing, personnel management, accounting issues in veterinary practice management. Legal/ethical parameters for veterinary practice. Attendance required.

CVM 6050 Animals and Society (2 cr; A-F only.)UC 4301, VCS 3050) Roles that animals have in society. Problem-based learning. Students research their assigned topics, followed by presentation (e.g., point-counterpoint debate, PowerPoint presentation, skits, educational handout, videos) at the beginning of class in the following class period.

CVM 6102 Veterinary Imaging Part 1 (2 cr; A-F or Aud) Introduction to physics of radiology. Radiographic principles/techniques. Cardiovascular, pulmonary, urogenital systems. Emphasizes interpretation of radiographs (film or digital) germane to common animal diseases. Clinical applications. Lectures, lab exercises using body systems approach to imaging (primarily radiographic) of large/small animals.

CVM 6103 Veterinary Imaging Part 2 (2 cr; A-F or Aud. Prereq-6102, 3rd yr DVM or #) Musculoskeletal, general abdomen and alimentary tract systems. Emphasizes interpretation of radiographs (film or digital) germane to common animal diseases. Clinical applications. Lectures, lab exercises using body systems approach to imaging (primarily radiographic) of large/small animals.
CVM 6105 Small Animal Ultrasonography (1 cr; max 2 cr) | S-N or Aud. Prereq: [6102, 6103, 3rd yr DVM student] or # | Body systems approach to imaging (primarily abdominal) of small animals. Ultrasonographic physics/technique, normal anatomy. Portal vein-associated organs, general abdomen (masses, effusions, tissue echogenicity, bowel) Upper/lower urinary tracts, genitalth tract, echocardiography. Head/neck ultrasound (eye, thyroid, etc.). Background of image generation/interpretation of sonograms germane to common animal diseases.

CVM 6132 Reproductive Biology (3 cr; A-F or Aud. Prereq: DVM 2nd yr or #) | Physiology of reproduction, including lactation.

CVM 6136 Small Animal Nutrition: Advanced Block (2.5 cr; Student Opt. Prereq: 3rd yr DVM or #) | Clinical major mechanisms of action; clinical usefulness; side absorption, distribution, metabolism, and excretion; or Aud. Prereq-DVM or #) Pharmacology of drugs that appoints.

CVM 6137 Small Animal Clinical Nutrition (2 cr; max 6 cr) | A-F only. Prereq: DVM 3rd or 4th yr DVM or #) | Nutrition assessments of ICU patients, perform Center, manage nutritional needs of patients, perform nutritional management plan for patients.

CVM 6142 Veterinary Neuropharmacology (1 cr; A-F or Aud. Prereq: DVM 2nd yr or #) | Pharmacology of drugs that have a major effect on the central nervous system: absorption, distribution, metabolism, and excretion; major mechanisms of action; clinical usefulness; side effects; drug interactions.

CVM 6195 Veterinary Toxicology (3 cr) | A-F or Aud. Prereq: DVM 2nd yr or #) | Toxicology of minerals, pesticides, venoms, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.

CVM 6205 Infectious Agents: Parasitology (4 cr; max 7 cr) | A-F or Aud. Prereq: DVM 2nd yr or #) Systematic and biologic study of protozoan, arthropod, and helminth parasites of animals. Emphasizes relationships to diseases and principles of parasite control.

CVM 6206 Infectious Agents: Bacteriology (3.5 cr; A-F or Aud. Prereq: DVM 2nd yr or #) | Veterinary medical microbiology/mycology. Mechanisms of pathogenesis, clinical presentations, diagnostic approaches, host responses to infectious challenge. Prevention and treatment. Laboratory exercises are used to test students' ability to isolate/define potential bacterial pathogens.

CVM 6207 Infectious Agents: Viralology (3 cr; A-F or Aud. Prereq: DVM 2nd yr or #) | Concept of viruses that affect animal species of veterinary significance. How virus/host factors interact. How these interactions lead to disease or recovery. Applications to prevention/management of disease. Mechanics of virus-host interactions in important viral diseases. Using literature to solve virological problems and evaluate strategies for controlling viral diseases.

CVM 6208 Infectious Agents: Pharmacology (1 cr; A-F or Aud. Prereq: DVM 2nd yr or #) | Clinical pharmacology of anti-microbial, anti-fungals, and anthelmintics used in veterinary medicine. Mechanisms of action, development of resistance, comparative anti-microbial spectrum of agents in their drug classes, toxicities associated with use, and ways to minimize these.

CVM 6209 Clinical Epidemiology (1.5 cr; A-F only. Prereq: DVM 2nd yr or #) | Statistical and epidemiological concepts applied to veterinary medicine.

CVM 6222 Advanced Clinical Epidemiology (1 cr; max 2 cr; A-F only) | Students apply epidemiologic principles to control of infectious diseases in animal populations. Review of scientific literature. Global impacts of infectious diseases. Diagnostic tests, disease outbreak investigation, economics of disease control/surveillance.

CVM 6250 Clinical Skills III (1 cr; S-N or Aud. Prereq: DVM 2nd yr or #) | Domestic animal behavior. Basic animal handling and management skills.

CVM 6254 Clinical Skills IV (1 cr; S-N or Aud. Prereq: DVM 2nd yr or #) | Domestic animal behavior. Basic animal handling and management skills.

CVM 6255 Clinical Skills V (1 cr; S-N or Aud. Prereq: DVM 3rd yr or #) | Domestic animal behavior. Basic animal handling/management skills. Small-animal clerk duty is required. Using an IV/syringe pump, setting up ICU order sheets, using glucometer/centrifuge to perform “big four” daily ICU CTS.

CVM 6266 Small Animal Clinical Skills: Advanced Block (1 cr; S-N or Aud. Prereq: DVM 3rd or 4th yr DVM or #) | Advanced clinical skills used by small animal practitioners in private practice.

CVM 6272 Clinical Skills Elective (1 cr; max 2 cr). S-N only. | Hands-on clinical skills. History taking, physical exam, basic/intermediate technical procedures on small animals. Skills are practiced at several approved locations.

CVM 6304 Domestic animal behavior. Basic animal handling and management skills.

CVM 6305 Small Animal Dental Hygiene (3 cr; A-F or Aud. Prereq: DVM 3rd or 4th yr DVM or #) | Dental hygiene focused on small animal dental hygiene. Focus on dental disease prevention, management, dental health, and patient education. Students are introduced to small animal dental hygiene.

CVM 6306 Small Animal Clinical Skills: Advanced Block (1 cr; S-N or Aud. Prereq: DVM 3rd or 4th yr DVM or #) | Advanced clinical skills used by small animal practitioners in private practice.


CVM 6316 Small Animal Gastroenterology Endoscopy (3 cr; S-N or Aud. Prereq: DVM 3rd or 4th yr DVM or #) | Endoscopic diagnosis/treatment of small animal diseases.

CVM 6404 Small Animal Dermatology: Advanced Block (1 cr; A-F or Aud. Prereq: DVM 3rd yr or #) | Case-based discussion of common dermatologic conditions that affect dogs/cats. Students work on clinical cases outside classroom. Cases are discussed in classroom.


CVM 6416 Small Animal Gastroenterology Endoscopy (3 cr; S-N or Aud. Prereq: DVM 3rd or 4th yr DVM or #) | Endoscopic diagnosis/treatment of small animal diseases.
CVM 6430 Cardiopulmonary System Disorders (4 cr; A-F or Aud. Prereq-DVM or #) Pathophysiology, presentation, diagnostic, and management protocols for common disorders of the cardiovascular and pulmonary systems.

CVM 6434 Critical Care: Advanced Block (1 cr; S-N or Aud. Prereq-[3rd or 4th] yr DVM or #) Case-based discussions of common emergencies: trauma, toxins, acute abdomen, hemotologic, respiratory. Emergency procedures, intensive care monitoring, blood gas interpretation. Sepsis, related inflammatory response. Cardiopulmonary resuscitation.

CVM 6436 Small Animal Cardiology: Advanced Block (1 cr; A-F or Aud. Prereq-[3rd or 4th] yr DVM or #) Diagnostic/therapeutic considerations related to small animal cardiovascular disorders beyond core in preparation for clinical rotations.

CVM 6440 Nervous System Disorders (2 cr; A-F or Aud. Prereq-DVM 3rd yr or #) Pathophysiology, presentation, diagnostic, approach, therapeutic approach, and management protocol for common neurologic disorders in domestic species.

CVM 6441 Animal Behavior Elective: Advanced Block (1 cr; S-N or Aud. Prereq-[3rd or 4th] yr DVM or #) Introduction to abnormal/undesired animal behavior, diagnostic procedures, and behavioral/pharmacological modifications.

CVM 6442 Small Animal Anesthesia Advanced Block Core (1 cr; Student Opt. Prereq-[3rd yr DVM or #) Sedative techniques, combination injectable anesthesia, pediatric/geriatric small animal anesthesia, pain control, regional techniques, anesthesia in trauma cases, complications in anesthesia, ventilator use.

CVM 6445 Non-Traditional Pet Core (1 cr; A-F or Aud. Prereq-3rd yr DVM or #) General/reproductive biology, behavior, husbandry, nutrition, handling, restraint, anesthesia. Common diseases and their treatments. Research animal issues. Special considerations of species commonly encountered in small/mixed animal practices (mice, rats, hamsters, gerbils, guinea pigs, chinchillas, rabbits, ferrets, basic aquarium species).


CVM 6450 Veterinary Public Health (1 cr; max 2 cr) A-F only. Prereq DVM 3rd or 4th yr or grad student or #) Interacting with public health, regulatory, and community activities. Roles in food industry. Public/occupational health, environmental problems. Zoonotic disease problems, food safety, occupational safety/health, euthanasia, carcass disposal, reporting, epidemiologic investigations, animal transportation/control, emergency preparedness. USDA accreditation. Students select clinical case, prepare oral response to hypothetical questions, and conduct occupational safety/hazard review, present findings.

CVM 64510 Veterinary Public Health (1-2 cr) A-F or Aud. Prereq DVM 3rd or 4th yr or grad student or #) Veterinary Public Health. Students select a clinical case, prepare oral response to hypothetical questions, and conduct occupational safety/hazard review, present findings.

CVM 6451 Necropsy (2 cr; max 40 cr) Students perform necropsies, collect tissues for lab analysis, interpret clinicopathologic findings, prepare reports on animals submitted to Veterinary Diagnostic Laboratory, apply basic/clinical science to diseases for animals and populations of animals. Students may participate in history taking. Case findings discussed daily. Student groups present case reports at weekly departmental seminar.

CVM 6452 Zoo and Wildlife Rounds (5 cr; S-N 1st yr fall students only) Zoo, wildlife, and exotic pet conservation. Seminar involving topics of exotic animal conservation, veterinary medicine, and pathology encountered at the Minnesota, Como, and Lake Superior Zoo, Raptor Center, and Minnesota Veterinary Diagnostic Laboratory. Basic biology of the affected animals, clinical aspects, and pathology of encountered diseases will be presented and discussed by zoo keepers, case veterinarian, and/or case pathologist, and students. Apply principles of basic and clinical science to address the cause of disease for individual animals as well as populations of animals.

CVM 6502 Extenship (Exten) (2 cr; max 24 cr) S-N or Aud. Prereq DVM 3rd or 4th yr or #) Students spend two weeks in practice or other professional setting.

CVM 6529 Equine Medicine Rotation at Other Institution (2 cr; max 4 cr) Prereq DVM 3rd or 4th year or #) Rotation through which students may take a required dermatology course at another accredited veterinary college.

CVM 6512 Dermatology Rotation at Other Institution (2 cr; max 4 cr) Prereq DVM 3rd or 4th year or #) Rotation offered allowing students to fulfill their dermatology rotation requirement at another accredited veterinary college.

CVM 6520 Radiology Rotation at Other Institution (2 cr; max 4 cr) Prereq DVM 3rd or 4th year or #) Rotation through which students may take a radiology rotation at another accredited veterinary college and used to meet core requirements.

CVM 6529 Equine Medicine Rotation at Other Institution (2 cr; max 4 cr) Prereq DVM 3rd or 4th year or #) Equine Medicine Rotation at another accredited veterinary college and used to meet a core medicine requirement.
Adverse reactions, removal of product from market.

CVM 6540 Advanced Veterinary Toxicology (2 cr; max 8 cr; 5 N or Aud. Prereq: DVM 3rd or 4th yr or #) In-depth examination of toxic substances. Clinical, diagnostic, mechanistic, and therapeutic aspects of clinical toxicology and inorganic toxics that affect livestock, poultry, wildlife, and companion animals or that threaten public health.

CVM 6545 Introduction to Regulatory Medicine (2 cr; A-F or Aud. STXCL 5545. Prereq: DVM or #) Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market.

CVM 6560 Public Health Issues & Veterinary Medicine Opportunities (1 cr; max 2 cr; A-F: only) Introduction to public health principles and veterinary medicine. Focus on the day-to-day work of public health professionals. Public health principles in context. Veterinary medicine related to public health research/practice. Students interact with advocacy groups, media, lobbyists, legislators, regulatory officials, industry leaders, and public health professionals.

CVM 6581 Small Animal Internal Medicine (2 cr [max 8 cr]; Student Opt. Prereq: DVM 3rd or 4th yr or #) Primary case responsibility for wide range of clinical diseases. History taking, physical examination, problem definition, diagnostic/therapeutic plans on assigned cases. Cases typically related to gastroenterology, urology/nephrology, oncology, neurology, immunology, and cardiology. Daily rounds. Students present case discussion topics and interpret lab data, radiographic evaluations, and biopsy information. Emphasizes effective communications with clients and with referring veterinarians.

CVM 6602 Small Animal Internal Medicine: (SAM B) (2 cr [max 52 cr]; Student Opt. Prereq: [6601, DVM 3rd or 4th yr]) or Problem-solving skills, clinical skills, communication skills, record keeping, ethical issues in referral cases. Methods of knowledge acquisition, including computerized searches and diagnostic programs. Small group round discussions. Students assist clinicians in management of referral/emergency cases. Cases typically related to gastroenterology, nephrology, urology, oncology, nutrition, neurology, and cardiology.

CVM 6606 Emergency Critical Care (2 cr; max 20 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Evening/weekend ER service, day ER service. Medical/surgical emergency/traumatic cases. Students assist staff clinicians in diagnosis and case management. Triage, history taking, physical exams, clinical problem solving, patient management. Students give presentation on a case they were involved in within rotation.

CVM 6608 Critical Care (2 cr; max 20 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Primary case care for ICU patients. Some emergency receiving. Daily rounds, including case discussion and critical care topics. Limited case care responsibility, including SOAP and treatment orders on existing patients. Students present a short rounds discussion on critical care topic of their choice.

CVM 6610 SA Dentistry and Oral Surgery Elective (2 cr; A-F or Aud. Prereq: 3rd or 4th yr) Small animal dentistry and oral surgery. Emphasis on clinical medicine and techniques, including exotic animal dentistry.) Clinical recognition, diagnosis, assessment, and treatment of dental, oral, and maxillofacial pathology common to small animal clinical practice. Didactic lectures, laboratory teaching, small group learning exercises, and critical overview of published literature (which will be utilized in the group case presentations). Feline oral surgery; noninvasive maxillofacial fracture repair techniques. Critical grading on surgical procedures.


CVM 6626 Small Animal Orthopedics (1 cr. S or Aud. Prereq: DVM 3rd or 4th yr or #) Small animal orthopedic problems and surgical procedures to correct them.

CVM 6636 Behavior (Behav) (2 cr; max 2 cr; Student Opt. Prereq: DVM 3rd or 4th yr) or grad student or #) Students participate in behavior consultations: history taking, diagnosis, outline of treatment protocols, sample collection, demonstration of training techniques, writing of treatment plans, case follow-up. Students present one case, prepare one topic of their choice for presentation during rounds. Daily rounds include discussion of cases, review of behavior-related articles, and discussion of problem complexes.

CVM 6638 Dermatology (Derm) (2 cr; max 20 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Routine dermatologic problems in companion animal practice. History taking, clinical diagnosis, patient management, client education. Students participate in all phases of diagnosis and management of cases. Small group discussions.

CVM 6640 Comparative Ophthalmology (Ophth) (2 cr; max 40 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Students present at the level of ophthalmology. Diagnosis, treatment. Outside readings, reviews, papers; final essay exam.


CVM 6648 Advanced Clinical Oncology Rotation (2 cr; max 4 cr; Student Opt. Prereq: DVM 3rd or 4th yr or grad student or #) Case management, self-directed research. Students receive oncology referrals, work on emergency cases and special procedures, assist in treatment decisions and therapeutic options for new cases, and manage ongoing chemotherapy/radiation therapy patients. Emphasizes principles of oncology and patient care.

CVM 6651 Small Animal Ultrasound (SAUS) (2 cr; max 8 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Ultrasound equipment, physics of ultrasound, planar abdominal anatomy, abdominal ultrasonography/abdominal masses/effusions, sonographic assessment of liver, spleen, pancreatic diseases, urinary tract diseases, male/female reproductive tract. Head and small parts. Introduction to cardiac ultrasound.

CVM 6661 Neurology (Neur) (2 cr; max 4 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Medical/surgical neurology. Providing complete neurological service for clients, patients, and hospital. Integration into all aspects of service, including receiving, workup, surgery, care, communications, and discharges.


CVM 6666 Small Animal Surgery (SAS) (2 cr; max 8 cr; Student Opt. Prereq: DVM 3rd or 4th yr or #) Diagnostic/therapeutic management of surgical patients. History taking, physical examination, communication, problem solving, and surgical techniques. Ecomomic issues. Students work as part of a surgical service team with faculty member, resident, and intern.
CVM 6682 Small Animal Theriogenology (2 cr [max 4 cr]; Student Opt. Prereq: DVM 3rd or 4th yr or #) Breeding management, artificial insemination, semen collection/evaluation, dystocia management. Testing for canine brucellosis, pyometra, vaginitis, and prostate disease. Interactive review sessions, case studies, client cases. Students present review of a “theriogenology question of the month” from JAVMA and present study on reproduction topic of choice.

CVM 6685 Small Animal Reproductive Diagnostic Technique Lab (2 cr; S-N or Aud. Prereq: DVM 2nd yr DVM student or #) History/principles of acupuncture, chiropractic, and other commonly used complementary approaches to care for domestic animals. Training requirements for certification. Lectures, case examples, demonstrations.

CVM 6691 Veterinary Acupuncture (AcPunct) (2 cr [max 6 cr]; Student Opt. Prereq: [6690, yr 3 or 4 DVM] or #) Basic veterinary acupuncture theory, point combination, treatment, diagnosis of diseases, hands-on veterinary acupuncture technique.

CVM 6702 Large Animal Palpation Labs (2 cr; S-N only. Prereq: DVM or #) Hands-on clinical experiences in equine, bovine, and large animal reproductive status/disorders. Students select species.

CVM 6704 Reproductive Diseases of Cattle (2 cr [max 6 cr]; A-F or Aud. Prereq: 3rd yr DVM or #) Common diseases affecting reproductive function in cattle, swine, and small ruminants.

CVM 6711 Large Animal Medicine (LAM) (2 cr [max 8 cr]; Student Opt. Prereq: DVM 3rd or 4th yr or #) Medical diseases of horses, cattle, small ruminants, South American camels, and potbellied pigs. History taking, clinical diagnosis, patient management. Assessment of treatment responses. Clinic case material, opportunities to practice common procedures. Small group discussions on clinical diagnosis, treatment, and prevention of common medical disorders.

CVM 6712 Equine Ambulatory Rotation (2 cr [max 4 cr]; A-F only) Equine ambulatory rotation meeting for two weeks performing farm calls, call backs, X-ray development, and restocking the van. Student and practitioner discuss cases as calls are being made.

CVM 6714 Large Animal Surgery (LAS) Student Opt. program or #) General surgery, lameness cases. Emphasizes horses. Some cattle, small ruminants/camelids. Diagnostic/therapeutic management in hospital setting. Cases, rounds, exercises. Students work as part of surgical team in cases ranging from routine to those requiring intensive management or advanced diagnostic/therapeutic techniques available in a referral setting.

CVM 6715 Large Animal Surgery and Lameness (2 cr [max 10 cr]; Student Opt. Prereq: 3rd or 4th yr DVM student or #) General surgery, lameness cases. Emphasizes horses. Some cattle, small ruminants/camelids. Diagnostic/therapeutic management in hospital setting. Cases, rounds, exercises. Students work as part of surgical management or advanced diagnostic/therapeutic techniques available in a referral setting.

CVM 6718 Large Animal Community-based Practice Monitoring (1 cr; S-N only. Prereq: 2nd yr DVM or #) Large animal veterinary practice, clinical skills. Students pair with a veterinarian and visit veterinary practice for a total of 16 hours during term.

CVM 6719 Large Animal Community-based Practice: Surgical (2 cr [max 4 cr]; A-F only. Prereq: 3rd yr DVM or #) Equine medicine, general, and large animal community-based practice. Students work with large animal veterinary practice, clinical skills. Students pair with a veterinarian and visit veterinary practice for a total of 16 hours during term.

CVM 6720 Advanced Equine Practice Elective (3.5 cr [max 8 cr]; S-N or Aud. Prereq: 3rd or 4th yr DVM or #) Equine medicine, surgery, theriogenology content/skills beyond core.

CVM 6721 Advanced Equine Practice Elective: Surgical Supplement (2 cr; S-N only. Prereq: 3rd or 4th yr DVM or #) Equine medicine, surgery, theriogenology content/skills beyond core, necessary for entering predominately equine practice. Intensive lab.

CVM 6722 Equine Dentistry and Preventive Medicine (2 cr [max 4 cr]; A-F only. Prereq: 3rd or 4th yr DVM or #) Dental and general preventive care. Field trips, presentations, labs, case studies, clinical cases.

CVM 6724 Equine Surgery (2 cr [max 8 cr]; Student Opt. Prereq: DVM 3rd or 4th yr or #) Basic surgical principles relating to horses. History taking, diagnostics. Development of therapeutic plan from surgical standpoint.
CVM 6752 Advanced Equine Elective 1 (1 cr; A-F only. Prereq-Veterinary core curriculum for Advanced Equine Elective) More depth on equine health topics than offered in core curriculum. Includes cadaver lab and two live horse exercises.

CVM 6753 Advanced Equine Elective 2 (1 cr; A-F only. Prereq-Advanced Equine Elective 1, Lecture format) Topics in equine medicine. More depth than core veterinary courses.

CVM 6754 Advanced Equine Elective 3 (1 cr; A-F only) Equine sports disciplines, adaptations to training, common causes of poor performance. Assigned project.

CVM 6789 Fresh Dairy Doe and Newborn Goat Kid Management (2 cr [max 4 cr]; A-F only) Rotation at Poplar Hill Goat Dairy during fresh doe/goat kid season. How to recognize, diagnose, and treat illnesses. Health strategies to control Johne’s disease, caprine arthritis, encephalitis virus, coccidiosis, neonatal diarrhea, mastitis, parasitism, and nutritional deficiencies.

CVM 6790 Advanced Small Ruminant Practice (1.5 cr) Training beyond core in practice of small ruminants. Common diagnostic/therapeutic procedures.

CVM 6792 Small Ruminant Health and Production Rotation (SmRu) (2 cr [max 4 cr]; Student Opt. Prereq DVM 3rd or 4th yr or #) Techniques in equine reproduction. Handling of stallions/mares. Testing for estrus detection. Rectal palpation, ultrasound exam of reproductive tract. Breeding management, hormone treatments, vaginal examination, uterine culture, cytology/biopsy, semen collection/evaluation, intrauterine therapy, artificial insemination.


CVM 6794 Camelid Medicine, Surgery, Reproduction, and Health Management (2 cr [max 4 cr]; A-F only. Prereq-3rd yr or 4th yr DVM or #) Two-week rotation. Approximately 15 farm visits are made to alpacas/llama farms. Approximately 10 alpacas/lamas are evaluated at VMC. Hands-on learning environment. Physical exam, venipuncture, ultrasound. Field surgeries such as castration, dental work, foot trimming, venipuncture, body condition score, preventive health management, pharmaceuticals. Common medical/reproductive problems. Interstate health certificates. Tuberculosis testing and necropsy.

CVM 6795 Herd Health (2 cr; S-N or Aud. Prereq-1st yr DVM or #) Herd health programs for dairy/beef cattle, sheep, and dairy goats. Components that constitute a herd health program, their costs/timing. Farm tours demonstrate need/method of applying herd health programs in commercial production settings.


CVM 6797 Cow-Calf Herd Health and Production (CCHP) (2 cr [max 4 cr]; Student Opt. Prereq DVM 3rd or 4th yr or #) Cow-calf production, medicine, health management. Seasonal health management, purchasing/introducing new stock, facility requirements/design, husbandry, field diagnostics, reproductive management, vaccine protocols, record keeping, zoosyn. Breeding soundness, dystocia management, body condition scoring, ultrasound, castration, dehorning, venipuncture/parasite control. Field trips to cow-calf operations. Marketing system orientations.

CVM 6800 Bovine Palpation (1 cr; S-N only. Prereq- DVM or #) Practice in diagnostic evaluation of bovine reproductive tract.

CVM 6801 Advanced Dairy Production Medicine (1 cr; S-N or Aud. Prereq-3rd yr DVM or #) Designed to give veterinary students more in-depth coverage of topics in dairy production medicine at the management, preventive, and herd level.

CVM 6827 Dairy Production Medicine 2 (2 cr [max 4 cr]; Student Opt. Prereq-6818, 6826, 3rd or 4th yr DVM or #) Rotation expands on topics listed under Dairy Production Medicine 1.

CVM 6828 Dairy Production Medicine 3 (2 cr [max 4 cr]; Student Opt. Prereq-6818, 6826, 6827, [3rd or 4th yr DVM or #]) Rotation provides additional training following Dairy Production Medicine 2.

CVM 6829 Dairy Production Medicine 4 (2 cr [max 4 cr]; Student Opt. Prereq-[6818, 6826, 6827, 3rd or 4th yr DVM] or #) Rotation completes four rotation series in 6826, 6827, and 6828.

CVM 6831 Overview of Dairy Production Medicine (2 credit A-F) Dairy production medicine concepts, skills, and knowledge. Reproductive management, mastitis, epidemiology, records, nutrition, youngstock, housing, lameness. Mix of lectures, in-class exercises, and laboratory sessions. At least one field trip.

CVM 6832 Swine Core (2 cr; Student Opt. Prereq-DVM or #) Swine medicine, production, and health management.

CVM 6833 Avian Core (2-4 cr [max 4 cr]; A-F only, Prereq-3rd or 4th yr DVM or #) Swine medicine, production, and health management.

CVM 6834 Directed Studies in Dairy Production Medicine (2 cr [max 4 cr]; S-N only) Students explore dairy production medicine topic in greater detail. Review/report of rotation is submitted to faculty sponsor.

CVM 6883 Raptor Center (2 cr [max 4 cr]; Student Opt. Prereq-6497, DVM 3rd or 4th yr, #) Students participate in all aspects of raptor medicine, surgery, and rehabilitation and gain avian experience.

CVM 6900 Microscopic Anatomy (4 cr; A-F. Prereq-DVM 1st yr or #) Students learn the identification, description, and understanding of the basic structure and function of cells and tissues and will be able to identify and describe the structure and organization of the organ systems presented. This leads to a basic structural understanding of the specific organ systems as it relates to their function.

CVM 6901 Physiology I (5 cr; A-F or Aud. Prereq-1st yr DVM) Fundamental principles of cell physiology, muscle physiology, neurophysiology, and cardiovascular physiology, including the relationships between forces and flows in biological systems and an overview of nervous system control of viscera, muscle, and glands. In addition, the course will cover the anatomy and physiology of the central nervous system (brain and spinal cord) and special senses (vision, hearing, taste, and olfaction) of domestic mammals.

CVM 6902 Veterinary Biochemistry, Nutrition and Genetics (5 cr; A-F. Prereq-DVM 1st yr) The course starts with the expectation that students still have a working knowledge of the normal structure and function of biomolecules from their prerequisite biochemistry course. PowerPoint presentations of background review material on amino acids, protein structure, enzyme function and regulation, simple carbohydrates, simple lipids, nucleotides, and nucleic acids are provided on the Moodle site. Along with this material are sample problems to impart the faculty’s expectation of student familiarity with this material prior to class. The professors also expect that a working knowledge of simple genetics, including genome structure, principles of inheritance, and genetic variation have been retained from the prerequisite genetics course. In this case, the necessary background concepts will be better provided in class.

CVM 6903 Anatomy I (1 cr; A-F. Prereq-DVM 1st yr or #) This course is a sequential integration of normal gross and radiographic anatomy of the carnivore. The knowledge gained within these two disciplines will provide students with a solid foundation for current and subsequent courses within the veterinary professional curriculum. NOTE: For clarity, this syllabus covers gross and radiographic anatomy as separate units, but there will be overlap of material throughout the course.

CVM 6904 Clinical Skills (3 cr; A-F or Aud. Prereq-DVM 1st yr) This course is designed to introduce students to the common species and a variety of fundamental clinical skills for small and large animal species. These skills include a proper physical exam, safe handling and restraint, behavior and animal safety, and frequently used clinical skill procedures.

CVM 6905 Professional Development I (1 cr; A-F or Aud. Prereq-DVM 1st yr) Students receive an overview of the professional curriculum, animal use in the DVM curriculum, and the economic future of the veterinary profession; an introduction to personal financial planning; an introduction to the broad range of career options available to graduate veterinarians and the preparation and training needed to pursue specific options; awareness of expectations regarding professional behavior and ethics. The effects of addiction on veterinary professionals is examined. Themes for subsequent courses in the series include clinical communication, applied communication, and thinking like a doctor.

CVM 6906 Critical Scientific Reading (2 cr; S-N Prereq-CVM 1st yr or CVM transfer) Skill development in reading of scientific literature. Papers are critiqued for experimental design, statistical analysis, validity of results, contributions to the literature, and merit of the study conclusions.

CVM 6907 Professional Development II (2 cr, S-N) This is the second in a series of four courses addressing non-medical aspects of the student’s development as a veterinary professional, and covers a variety of issues students need to be exposed to in order to be a well-rounded professional. The course will provide an overview of One Health, animal welfare, legislative/current issues, and field trips to visit animal production facilities. One class will be a panel discussion on practice management, which will build on conversations from the career panel discussion in Professional Development I.

CVM 6908 Anatomy II (1 cr; A-F) This course is a sequential integration of normal gross and radiographic anatomy of urologicals. The knowledge gained will provide students with a solid foundation for current and subsequent courses in the veterinary curriculum.
Clinical Skills II (1cr; A-F) This course is designed to introduce students to the common small and large animal species and a variety of fundamental clinical skills for small and large animal species. These skills include a proper physical exam, safe handling and restraint, behavior and animal safety, and frequently used clinical skills procedures. The course will include lectures, laboratories, and practicum formats. Lectures will be given in 125 Animal Science/Veterinary Medicine. A total of seven labs in the fall and five to seven labs in the spring are hands-on focused to learn and practice skills taught in the clinical skills course. There is a large animal practicum experience that involves a rotation in the large Animal Hospital in the evenings and weekends.

Physiology II (6cr; A-F) This class helps students understand anatomic strategies adopted by different animal species to achieve the same or similar function and important physiologic processes used by animals to maintain homeostasis. Students will also learn about the neural, endocrine, and paracrine regulation of organ systems, intermediary metabolism as it relates to development, growth, and maintenance. By the end of the course, students will understand the processes used by different organ systems to accomplish the same outcome. Host defense mechanisms that prevent or modulate inflammation of infection application of principles of biochemistry, physiology, and pathology in the diagnosis and treatment of disease and the animal, its health and diseases, in the context of populations of animals.

Immunology (2cf; A-F) This course is an introductory and multidisciplinary unit consisting of a series of lectures to provide a basic understanding of the cells, molecules, and mechanisms of host defense against microbial pathogens and neoplasia, as well as immune-mediated pathologies such as allergies and autoimmunity.

Basic Pathology (2cr; A-F) Mechanisms in reactions of cells/tissues to injury. Retrogressive changes in cells, cell death, pigments, circulatory disturbances, inflammation, alterations of cell growth (including neoplasia). Applications to evaluation of gross and microscopic tissue alterations.

Agents of Disease I (4cr; A-F) This course will help students understand the mechanics of agent-host interactions in important animal diseases. Using the literature to understand and solve infectious disease problems and evaluate strategies for controlling diseases, students will also understand the basic structure of viruses, bacteria and parasites and comprehend how they interact with the host factors and how these interactions lead to disease and/or recovery.

Preventive Medicine (4cr; A-F) The goal of this course is to give students access to concepts of preventive medicine early in their training, recognizing that much of this information will be reinforced in other coursework.

Medical Management of Zoo Animals (1 cr; S-N or Aud. Prereq: 3rd yr DVM or #) Zoo animal handling techniques, including physical/chemical restraint, commonly seen diseases, preventive medicine programs. Adaptation to standard medical practice/management techniques for zoos. Lectures.

Diseases of Zoo Animals and Exotic Pets (1 cr; S-N or Aud. Prereq-DVM or grad or #) Diseases of and management procedures for zoo animals and exotic pets. Restraint procedures, medication, diagnosis.

Advanced Zoo Animal Medicine (1 cr; S-N or Aud. Prereq:[6931, [DVM 3rd or 4th yr]] or #) Adapting existing veterinary techniques/principles to zoo animal medicine. Animal management and preventive medicine programs.

Zoological Medicine (MNZM) (2 cr [max 20 cr]; Student Opt. Prereq-DVM 3rd or 4th yr or #) Introduction to all aspects of health care of zoo animals. Housing, nutrition, preventive health programs. Students assist zoo veterinarians with immobilizations, examinations, necropsies, laboratory work, and record keeping.

Selected Topics in Zoo Animal Medicine (5 cr [max 10 cr]; A-F or Aud. Prereq-DVM 1st or 2nd yr or #) Yearlong course. Overview of expertise needed by a zoo veterinarian, applications to specific captive species. Students participate in managing an animal problem or animal group problem; develop diagnostic, management, and therapeutic recommendations; research three topics on an assigned species; build reference materials for case care; present findings to keepers at a selected zoo; and develop an item for public education.

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