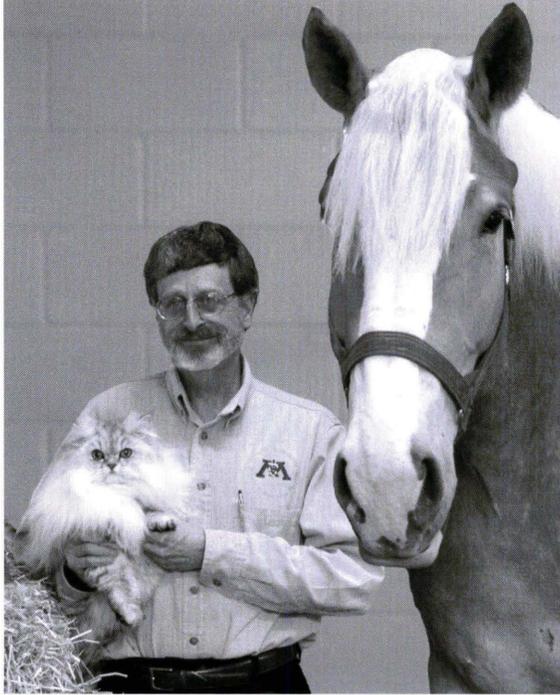


*College of*  
**Veterinary Medicine**  
2003-2005 Catalog





*Veterinary medicine is exciting,  
energizing, and endlessly fascinating.*

Think about it for a minute. What other profession contributes to both animal and human health? What other profession can be practiced in a clinic, on a farm, in a government agency, or in a food processing plant? What other profession is on the forefront of issues ranging from food safety to raptor conservation?

Preparing new veterinarians for success in this dynamic environment is the role of the University of Minnesota College of Veterinary Medicine. We educate students in cutting-edge science as well as traditional care. We combine the knowledge learned in the classroom with practical expertise learned in the field. And we reinforce the values of leadership, community, and compassion.

Together, the faculty, staff, and students of the College of Veterinary Medicine have built one of the nation's finest educational enterprises. Our graduates prove it every day.

Jeffrey S. Klausner, D.V.M.  
Dean

# College of Veterinary Medicine

2003-2005 Catalog

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## **Congratulations on your decision to study at the University of Minnesota College of Veterinary Medicine!**

### **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; they protect the public's health; they help protect endangered wildlife; and they 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 peoples' lives every day.

*"I have been continually impressed with the dedication and drive of the faculty. It's obvious that they want you to succeed in veterinary medicine and will regularly go beyond what is expected to assist you in any way possible."*

*Abna, Class of 2006  
Elbow Lake, MN*

### **The University of Minnesota College of Veterinary Medicine welcomes your application for admission into our programs.**

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

### **We're here to advise you and guide your career choices.**

You have several degree options from which to choose: a doctor of veterinary medicine (D.V.M.) degree, a dual D.V.M./master of public health degree, a dual D.V.M./Ph.D. degree program, an M.S. or Ph.D. in basic and clinical sciences. You will choose to care for companion animals, support agribusiness through food animal medicine, advance the conservation of wildlife, or pursue a scientific career in biomedical research. You will also decide whether to 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 correct ones for you.

### **If selected for D.V.M. admission or admission into 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 we admit 90 students into the D.V.M. program from hundreds of applicants. Our students come from all walks of life and levels of experience. 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.

We encourage you to visit [www.cvm.umn.edu](http://www.cvm.umn.edu) to learn more about the College of Veterinary Medicine. You may write to us at [dvminfo@umn.edu](mailto:dvminfo@umn.edu) or call us at 612-624-4747 for answers to any of your questions about the D.V.M. program. For information on the M.S. or Ph.D. programs please write to us at [vetresgp@umn.edu](mailto:vetresgp@umn.edu).

## The University of Minnesota College of Veterinary Medicine: The Best Choice for You

### World-Class Professional and Graduate Education

The University of Minnesota College of Veterinary Medicine is a leader in the study of infectious diseases, food safety, raptor conservation, and genomics and has a reputation for excellence in both large and small animal medicine. Established in 1947, the college has graduated more than 3,300 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 practice 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. Faculty members working with our M.S. and Ph.D. students are outstanding, and their research projects are on the cutting-edge.

### A Prestigious University

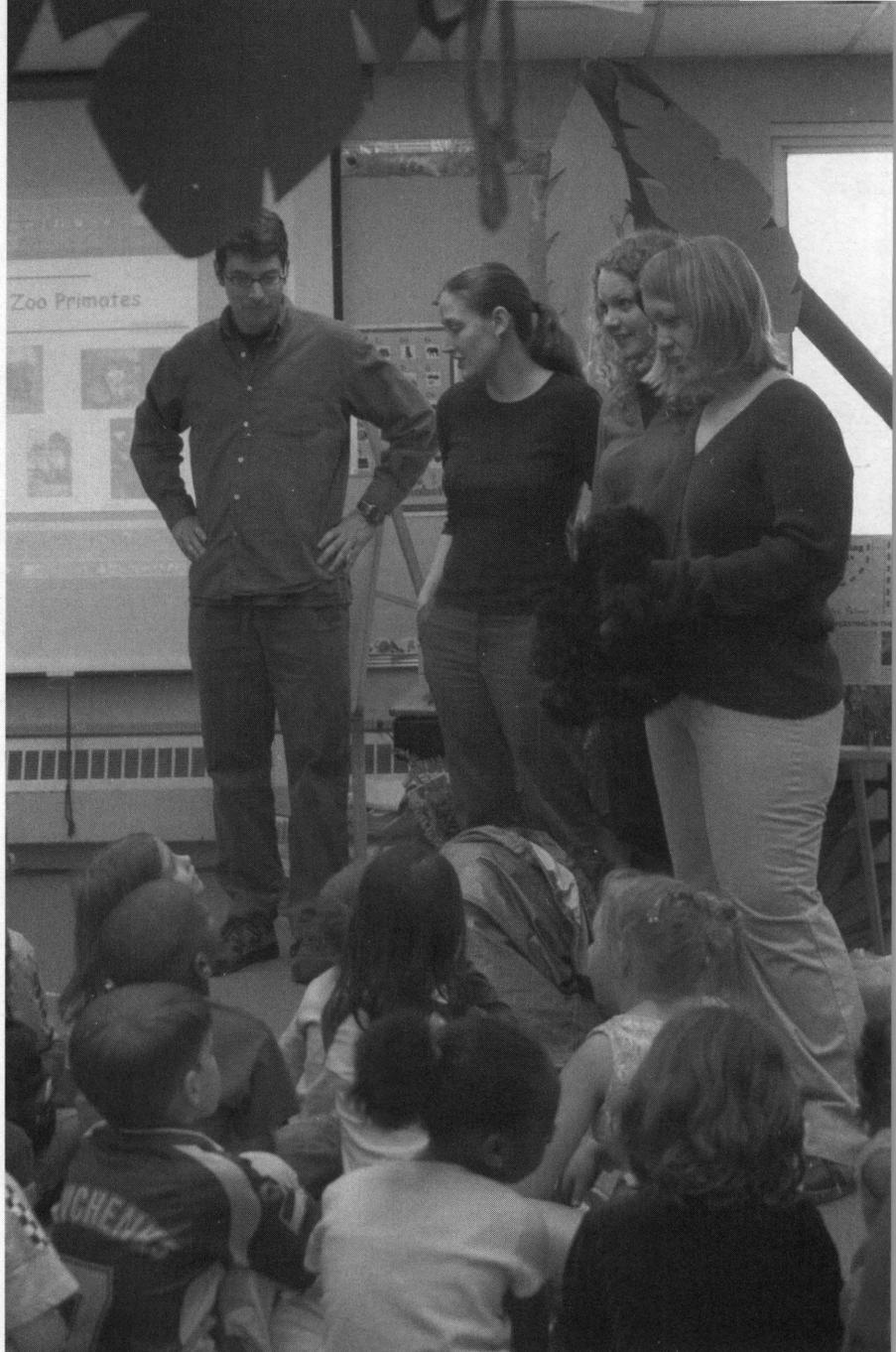
A land-grant university with a strong tradition of education and public service, the University of Minnesota ranks among the country's top 3 research institutions and among the top 20 public universities. In addition to your veterinary studies, you will have the opportunity to pursue interdisciplinary topics and issues. Only a handful of universities have schools of veterinary medicine, medicine, public health, agriculture, law, and business all located together. This combination of disciplines exposes you to a wide variety of perspectives and learning experiences — ranging from the study of ethics to conducting biomedical research.

### An Exciting Metropolitan Setting

Study, sleep, study, sleep. There should be more to your educational experience than this. 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. Collegia, Inc. ranks Minneapolis–St. Paul as one of the top five major metropolitan locations in which to seek higher education. 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. It's a great place to work and live.

### Learning-Centered Facilities

The college is housed in a complex of interconnected buildings on the St. Paul campus, home to five of the University of Minnesota's 20 colleges. Veterinary students study, conduct research, and practice in these buildings, including the Veterinary Medical Center and the Veterinary Diagnostic Laboratory.



*"The D.V.M./M.P.H. program gives you a feel for the impact of veterinary medicine on the real world. Even as vet students, we are able to show those already in the public health field the importance of veterinary medicine. It puts things into perspective for all of us."*

*Kara, Class of 2006  
Robbinsdale, MN*



## College of Veterinary Medicine Points of Pride

### Innovative Education and Experiential Learning

- An integrated curriculum gives students the opportunity to learn the relationship between the basic sciences and the clinical cases they will see in their practices.
- First and second year students benefit from hands-on, one-on-one work with local private practitioners.
- Second year students practice clinical skills during mini-rotations in the Veterinary Medical Center.
- Students practice with trained actors in a mock clinical setting to hone their client communication skills.
- Students develop professional skills in leadership, business, ethics, and other non-technical areas.
- Students choose from five specialized tracks (small animal, equine, food animal, mixed animal, and interdisciplinary).
- Fourth year students choose from over 60 rotations ranging from A to Z—“Advanced Building Design and Herd Evaluation” to “Zoological Medicine.”
- The college is one of the first to offer a dual D.V.M./M.P.H. program, allowing students to earn doctor of veterinary medicine and master of public health degrees in as little as four years.
- Our state-of-the-art dairy calving facility is the only one in the nation where students participate in intensive two-week on-site rotations.
- Our spiral computed tomography (CT) scanning machine allows students training in the latest technology.
- The nation’s first Veterinary Rapid Response Team enables students to gain real-world experience by helping government agencies respond to critical public health issues such as Chronic Wasting Disease.
- The new Summer Scholars Program offers selected students the opportunity to work as paid interns on research projects they help create.

### Cutting-Edge Research

- The college ranks second among all veterinary colleges in industry-sponsored research.
- When the Minnesota turkey industry was attacked by a deadly strain of avian pneumovirus, college researchers quickly sequenced the genome, developed new diagnostic techniques, and developed a vaccine approved by the USDA.
- An equine faculty member’s discovery of the disease polysaccharide storage myopathy, a painful muscle disorder, was named one of the top 10 discoveries of the last decade by Equus magazine.

- College faculty led the team that sequenced the genome of the causative agent of John's disease, a hard-to-diagnose, deadly disease that affects dairy cattle. This major, long-sought breakthrough opens the door to better diagnostics and preventive vaccines.
- A college faculty member co-invented the Gentle Leader, one of the most widely used tools for dog behavior modification. This device was named one of the top 100 inventions of the twentieth century by the Smithsonian Institution.
- When a worldwide outbreak of Porcine Respiratory and Reproductive Syndrome (PRRS) devastated the pork industry a faculty member developed a breakthrough swine vaccine.
- The possible location of an epilepsy gene has been identified in a dog breed's specific chromosomal area. Faculty are working on confirming these data while continuing to work on identifying this gene in other breeds.
- A scientific breakthrough representing the first entire genome of a veterinary pathogen to be sequenced was made by a team of researchers lead by a faculty member of the college
- By studying the epidemiology of urinary stones and then using information about associated risk factors to design studies of the underlying causes of stones, the Minnesota Urolith Center continues to take the lead in development of safe, effective, and affordable methods to medically dissolve and prevent uroliths.

#### Outstanding Programs and Resources

- The University of Minnesota Veterinary Medical Center is the busiest in the United States, with almost 40,000 small and large animal admissions per year. In addition to basic services, the center offers care in all of the specialty areas including dentistry, pet behavior modification, oncology, and complementary care.
- The Veterinary Diagnostic Laboratory is a leader in high volume testing, processing more than 1 million submissions annually from the United States and abroad. The lab is nationally known for its unique molecular diagnostics, which provide faster, more accurate results.
- The Center for Animal Health and Food Safety proactively contributes to the safety and security of the global food system and significantly strengthens our ability to anticipate and respond to threats from animal and foodborne diseases.
- 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.

- Internationally known for its swine expertise, the college sponsors the annual Leman Conference on swine production issues that attracts veterinarians and producers from around the world.

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*"It's really nice to be able to work with live animals during your first year. It's a nice break from being in lectures, and it reminds you why you are in vet school in the first place. Many other vet schools don't allow their students this luxury."*

*Meghann, Class of 2006  
Plymouth, MN*

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#### Successful Graduates

- JoAnne Bowman—first female veterinarian in the Army Veterinary Corps
- Phyllis Kanki—received a \$25 million grant to prevent the spread of AIDS in Nigeria.
- Stan Kleven—has developed a world-renowned avian mycoplasma research and service program.
- Harley Moon—one of only two veterinarians named to the National Academy of Science.
- Jim Rasmussen—veterinarian to hundreds of exotic and endangered animals at the Minnesota Zoo.

#### Alisen Vetter

In her role as a Research Scientist at Medtronic, Inc., Dr. Vetter was responsible for leading a global team of physicians and engineers in the development of a new pacemaker that, for the first time in the history of cardiac pacing, treats congestive heart failure as well as abnormally slow heartbeats. Since the market release of this cardiac pacing system, thousands of patients around the world have found relief from the symptoms of congestive heart failure. In many cases, drug therapies had failed to relieve their symptoms and the new pacemaker therapy was their last hope. Some patients have even been taken off the waiting list for a heart transplant because of the effectiveness of the new pacemaker in treating their cardiac disease.



## Choosing a Degree Program

The College of Veterinary Medicine offers the doctor of veterinary medicine (D.V.M.), dual doctor of veterinary medicine/master of public health degree (D.V.M./M.P.H.), a master of science (M.S.), a doctor of philosophy (Ph.D.) degree in molecular veterinary biosciences or veterinary medicine, or a dual doctor of veterinary medicine/doctor of philosophy (D.V.M./Ph.D.) degree.

### Professional Degrees

#### D.V.M.

- The D.V.M. is a rigorous four-year professional program preceded by three to four years of pre-professional study. During the first three years of the D.V.M. program, you will study the normal animal, the pathogenesis of diseases, and the prevention, alleviation, and clinical therapy of diseases. The D.V.M. program concludes with 14 months of clinical rotations in the Veterinary Medical Center, during which you will learn the methods of veterinary care and develop professional practice skills. The fourth year includes 6 to 10 weeks of externship experience at off-campus sites. Upon receiving your degree, you will be qualified to work as a veterinarian, pursue additional training in a specialty, or enter a graduate degree program. More detailed information about the D.V.M. curriculum is found on pages 11–13.

#### D.V.M./M.P.H.

- The Veterinary Public Health Program is one of the first in the nation that allows veterinary students to simultaneously earn a D.V.M. and a master's degree in public health (at least 41 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:
- After admission to the D.V.M. program, you apply to the School of Public Health for admission to the Veterinary Public Health program.
- You earn an additional 41 credits through M.P.H. courses taken during the summers before your first, second, or third year of the veterinary curriculum. The coursework includes some online distance learning courses as well as three-week public health institutes held on the University's Minneapolis campus.
- During your four years in the program, you will complete a public health field experience and a master's project under the guidance of a faculty adviser.
- The M.P.H. is offered by the School of Public Health, and tuition costs are separate from those of the College of Veterinary Medicine. To help keep this cost down, students are allowed to "double count" some of their coursework for both degrees.

#### D.V.M./Ph.D.

- 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. The D.V.M./Ph.D. curriculum requires completion of all professional degree requirements, as well as additional graduate study and bench research that is the basis of the Ph.D. thesis. Dual degree candidates must be accepted into the D.V.M. program before consideration for the Ph.D. program. Once accepted, students have two options for completing a dual degree: the concurrent dual degree option (students pursue the Ph.D. in the middle of their veterinary studies) and the sequential dual degree option (students complete the D.V.M. degree before starting Ph.D. studies). Financial support is available.

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## Interested in food animal medicine? Check out VetFAST

VetFAST, the Veterinary Food Animal Scholars Program, encourages students to pursue food animal practice in response to the demand for veterinarians trained to work with dairy cows, beef cattle, swine, poultry, sheep, and goats. VetFAST allows entering freshmen in the College of Agricultural, Food and Environmental Sciences to

- Receive an admissions decision from the College of Veterinary Medicine at the end of the first year of college, instead of the third or fourth year.
- Complete your B.S. and D.V.M. degrees in seven years instead of eight.
- Waive the GRE requirement as part of your admission process.
- Benefit from mentorships with college faculty and students.
- Secure scholarships and financial support through summer internships.

To learn more about VetFAST, contact the College of Veterinary Medicine 1365 Gortner Avenue, St. Paul, MN 55108-6188, 612-624-4747 or the College of Agricultural, Food and Environmental Sciences 1420 Eckles Avenue, St. Paul, MN 55108-6188, 612-624-3045.

**B.S. in Veterinary Science**—This limited option is for students who complete their undergraduate veterinary college prerequisites in three years or less and did not complete a baccalaureate degree. Rather than working another year at the undergraduate level, and provided you are accepted into the College of Veterinary Medicine, you earn your B.S. after completing two years of the veterinary curriculum. The B.S. degree gives you the credentials you need to pursue graduate and specialty education programs.

## Academic Degrees

### M.S./Ph.D

You may choose to pursue a master of science or doctor of philosophy degree in molecular veterinary biosciences or veterinary medicine.

Molecular veterinary biosciences areas of study include

- Immunobiology
- Microbiology and virology
- Pathology
- Cellular and molecular biology
- Genetics and genomics
- Physiology and pharmacology

Veterinary medicine areas of study include

- Comparative medicine and pathology
- Population medicine
- Surgery/radiology/anesthesiology
- Theriogenology
- Infectious diseases

Each graduate program has its own application procedure and deadline. To learn about admissions requirements, registration procedures, or requirements for graduate degrees, refer to [www.grad.umn.edu](http://www.grad.umn.edu) or write to [vetresgp@umn.edu](mailto:vetresgp@umn.edu). For questions about specific programs, call

- Director of Graduate Studies, Molecular Veterinary Biosciences at 612-624-2700
- Director of Graduate Studies, Veterinary Medicine at 612-624-0750
- College of Veterinary Medicine Web site, [www.cvm.umn.edu](http://www.cvm.umn.edu)

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*"Every day I spend in my clinical rotations confirms my decision to pursue veterinary medicine. Our faculty are better than the weather!"*

*Greg, Class of 2004  
Inver Grove Heights, MN*

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## Preparing for D.V.M. Admission

You may be fresh 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 during which all of your required pre-veterinary coursework is complete. For most students this is during your senior year, for other students it might be during your third year of college. About 20 percent of our students enter the D.V.M. program without completing their bachelor's degree first. The application deadline for the D.V.M. program is October 1—almost one full year in advance of the first semester in which you will enroll.

### D.V.M. Application Procedure

You must submit your application for the next fall by October 1—nearly one year in advance. The college belongs to the national Veterinary Medical College Application Service (VMCAS), which means that you may use one application to apply to any of the veterinary colleges belonging to VMCAS. You may submit your application online at [www.aavmc.org/vmcas.htm](http://www.aavmc.org/vmcas.htm). If you have questions about the application, please call the college's Academic and Student Affairs Office at 612-624-4747 or write to us at [dvminfo@umn.edu](mailto:dvminfo@umn.edu).



### Prerequisite Coursework

Following are the areas of study and number of semester credits required for admission to the College of Veterinary Medicine. If you plan to pursue a career in academia or research, you should consider additional courses in science and mathematics.

#### Biology (13–20 credits)

- General biology or plant biology ..... 3–5 credits with lab
  - Zoology or animal biology ..... 3–5 credits with lab
  - Genetics..... 3–5 credits
- Should include the mechanisms of heredity and their applications.
- Microbiology ..... 3–5 credits
- An introductory course with lab that includes taxonomy, morphology, physiology, and ecology of microbes.

#### Chemistry (17–27 credits)

- General chemistry with lab ..... 8–12 credits
- Organic chemistry with lab ..... 6 credits, two quarters or one semester
- Biochemistry with or without lab ..... 3–5 credits

#### Liberal arts and humanities (12–18 credits)

- History and social science ..... 6–9 credits
- Anthropology, economics, geography, history, political science, psychology, social science, and sociology courses can usually be used to fulfill this requirement.
- Arts and humanities ..... 6–9 credits
- Art, literature, and music courses can usually be used to fulfill this requirement as can many humanities, theater, and foreign language literature courses.

#### Mathematics (3 credits)

- College algebra (with prerequisite high school higher algebra) or pre-calculus or calculus.

#### Physics (8–12 credits)

- Should include mechanics, heat, sound, light, electricity, fluids, and atomic structures, topics normally covered in an introductory sequence with laboratory.

#### Writing skills (8 credits)

- Students must satisfy the requirement for graduation at the college they are attending.

#### Electives

- Electives may be selected based on your interests in a broad educational program. You're encouraged to choose courses in the care and management of animals when available. Other recommended electives include courses in business management, animal nutrition, electronic communication, statistics, economics, and public speaking.

### Profile of 2003 Successful D.V.M. Applicants

Applications.....	642
Resident .....	178
Non-resident.....	464
GPA in required courses (mean).....	3.59
GPA last 45 semester credits (mean).....	3.74
GRE Verbal and Quantitative: combined score (mean) .....	1,190

### 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—all three areas
- Knowledge of the profession, interest in animals, and professional goals
- Employment experience, communications skills, leadership, and extracurricular activities
- A structured behavioral interview that helps identify if a career in veterinary medicine is the right choice for you. The college is one of the first to implement this, based on the recommendation of the veterinary industry, practitioners, and our faculty.

### What It Costs

The cost of a veterinary education is an important financial investment. Here are the approximate costs for D.V.M. students during the 2003–2004 academic year.

#### 2003–2004 Yearly Tuition rates and estimated expenses

Resident .....	\$15,410
Nonresident .....	\$30,170
Student services fee.....	\$628
Computer.....	\$2,000
Books, lab equipment, notes, dissecting set, and supplies .....	\$1,000–\$1,600
Health Insurance (if needed) .....	\$1,182

*Tuition and fees are subject to change without notice.*

Fourth year veterinary students pay additional tuition for summer semester. The above expenses do not include living expenses, other incidental expenses, or the nonrefundable intent-to-enroll deposit of \$250. If you enroll, the deposit is applied to your first semester's tuition. For more information, call the Academic and Student Affairs Office at 612-624-4747 or write to [dvminfo@umn.edu](mailto:dvminfo@umn.edu).

### Residency

Minnesota residents receive priority consideration for admission and are charged a lower tuition rate than non-residents that 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 of October 1. For more information, contact the Resident Classification and Reciprocity Office by calling 612-625-4733 (St. Paul) or 612-625-6330 (Minneapolis) or by writing to 130 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108 or 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455.

## Reciprocity

The University has reciprocity agreements with North Dakota, South Dakota, and Manitoba. If you're a resident of these states or this province, you may qualify for reciprocity tuition rates, which are comparable to resident rates. For more information, contact the Resident Classification and Reciprocity Office by calling 612-625-4733 (St. Paul) or 612-625-6330 (Minneapolis) or by writing to 130 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108.

## 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 Web site for the FAFSA application found at [www.FAFSA.ed.gov](http://www.FAFSA.ed.gov). All applicants to the D.V.M. 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 Web site 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 003969.

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 \$100,000 in awards and scholarships presented at the college's spring awards ceremony.

## We're Here for You

### Student Services

If you have questions, we've got answers. If you need someone to talk to, we're here for you. If you're looking for an extracurricular activity, we can hook you up. Here are some of the services and programs we can provide.

- **Planning your educational program**—We host regularly scheduled information sessions, which provide an opportunity for you to visit campus and learn more about our degree programs, 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](mailto:dvminfo@umn.edu). If these sessions do not meet your needs or if you need more information we will arrange a meeting with an admissions counselor.
- **Maintaining your student records**—The Academic and Student Affairs Office maintains records on admissions, registration, scholastic standing, and degree requirements.



- **Finding a mentor**—Veterinary professionals can be a tremendous resource for you. That's why we offer a formal mentor program for D.V.M. students. In addition, each of the four classes has a faculty adviser who can answer your questions and help guide your educational experience.
- **Financing your education**—Finding the financial resources to fund your education is an important aspect of pursuing a veterinary program. The Office of Student Finance (financial aid) can provide answers, along with on-site financial aid counseling in the College of Veterinary Medicine at the start of each semester. The Academic and Student Affairs Office can provide information on scholarships.
- **Providing support to student organizations**—The Academic and Student Affairs Office provides administrative assistance to faculty advisers and student organizations.

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*"I am impressed with how student-friendly this college is! I feel as though our input is truly valued by the college. The administrators and clinicians treat the students as colleagues, rather than as mere students."*

*Lizz, Class of 2004  
Austin, TX*

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### **Student Organizations**

Participation in student organizations can help create a rich and satisfying learning experience, while helping you establish a network of peers and friends that you'll carry with you through your career. As a veterinary student, you may participate in the following organizations:

- Behavior Club
- Canine Club
- Production Animal Medicine Club
- Holistic Medicine Club
- Equine Club
- Feline Club
- Sheep, Goat, and Llama Club
- Zoo, Exotic, Avian, and Wildlife Club
- Veterinary Medicine Business Club
- Emergency and Critical Care Society

Looking for leadership or governance opportunities? Get involved in the following organizations:

- The CVM Student Council
- The Student Chapter of the American Veterinary Medical Association
- The St. Paul Campus Board of Colleges
- Honor Case Commission

### **Housing Information**

Need a place to live? Maybe we can help. Check out our Roommates Connection, a listing of students wanting to share a place to live with other veterinary students. The Office of Academic and Student Affairs also has a listing of apartments for rent, giving you a place to start your housing search. This information is sent to the newly admitted D.V.M. students in the late spring.

An additional resource is the University's off-campus housing site at [www.umn.edu/housing/offcampus.htm](http://www.umn.edu/housing/offcampus.htm). The University maintains two family housing sites, one on the St. Paul campus. The Housing and Residential Life home page can be found at [www.umn.edu/housing](http://www.umn.edu/housing).

## **After Graduation: Staying Connected**

### **Continuing Education**

Your education doesn't stop once you receive your degree. You'll want to expand your knowledge and skill base through continuing education. The University of Minnesota College of Veterinary Medicine offers a wide variety of learning opportunities for you to hone your skills, expand your horizons, and maintain your professional licensure. Our continuing education programs offer an opportunity to

- Hear nationally and internationally known experts lecture on different fields of veterinary medicine.
- Learn about new concepts, recent research developments, and innovative clinical procedures.
- Build relationships with practicing veterinarians and with academia and industry representatives.

Continuing education courses are also open to our students. Courses are held in the Twin Cities metro area. Visit [www.cvm.umn.edu/outreach](http://www.cvm.umn.edu/outreach) or call 612-624-2268 or 1-800-380-8636 to learn about upcoming learning opportunities.

### **Alumni and Friends**

Once you receive your degree from the University, that doesn't mean your relationship with the college has to end. In fact, all graduates are members of our Alumni and Friends Society, which promotes interest and support for the College of Veterinary Medicine, encourages communication and cooperation among alumni, and advises the dean on the dispersal of undesignated gifts to the college. The society's activities include an award-winning mentor program, a senior reception, international externships, undergraduate research, a senior directory, student council awards, alumni receptions, and an alumni newsletter.

# The D.V.M. Curriculum

## The Learning Curve

- During the first year you will learn about the structure and function of normal animals. You will also begin your clinical training.
- During the second year you will focus on infectious agents and the cause of disease. You will also begin to learn about disorders of organ systems and the treatment of these disorders. This will include your first surgery labs.
- The third year will conclude your classroom learning of organ system disorders. You will also start to focus heavily on the species of most interest to you in advanced courses.
- The fourth year puts 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's four-year curriculum is based on standards established by the Council on Education of the American Veterinary Medical Association. Course requirements for the first three years are similar for all members of a class. The curriculum offers flexibility in scheduling, a highly integrated approach to course topics, clinical coursework early in the program, and opportunities for students to develop professional practice skills before the fourth-year clinical rotations. The fourth-year clinical rotations offer students flexibility in selecting topics to be included in the final phase of their D.V.M. program. A breakdown of the program follows:

## First Year

Fall Semester	Credits
CVM 6000 Orientation to Veterinary Medicine	1
CVM 6011 Professional Skills	2
CVM 6021 Overview of Animal Populations I	1
CVM 6100 Veterinary Anatomy	5
CVM 6101 Normal Radiographic Anatomy	1
CVM 6110 Biochemistry	3
CVM 6111 Cells and Tissues	3
CVM 6301 Clinical Skills I	1
Total.....	17

### Spring Semester

CVM 6012 Professional Skills	2
CVM 6022 Overview of Animal Populations II	1
CVM 6112 Organology	3
CVM 6120 Veterinary Neurobiology	2
CVM 6130 Veterinary Physiology	4
CVM 6141 Veterinary Pharmacology	2
CVM 6201 Host Defenses	3
CVM 6211 Applied Veterinary Genetics	1
CVM 6302 Clinical Skills II	1
CVM 6441 Behavior Core	2
Total.....	21

## Interession

CVM 6134 Principles of Veterinary Nutrition	1
Plus selected electives from Optional Elective Choices list shown on page 12	

*"I love living in the Twin Cities area because everything you would ever want to do in a city is available out your front door, yet it only takes 15 or 20 minutes to arrive in the countryside for camping, hiking and canoeing."*

*Michelle, Class of 2005  
Asheville, NC*

## Second Year

### Fall Semester

CVM 6013 Professional Skills III	2
CVM 6202 Infectious Agents: Parasitology	4
CVM 6203 Infectious Agents: Bacteriology	3.5
CVM 6204 Infectious Agents: Virology	1.5
CVM 6205 Infectious Agents: Pharmacology	1
CVM 6220 Clinical Epidemiology	2
CVM 6300 Veterinary Pathology	7
CVM 6303 Clinical Skills III	1
Total.....	22

### Spring Semester

CVM 6014 Professional Skills IV	2
CVM 6102 Veterinary Imaging I	2
CVM 6132 Reproductive Biology	3
CVM 6142 Veterinary Neuropharmacology	1
CVM 6304 Clinical Skills IV	1
CVM 6321 Surgery, Anesthesia, Critical Care	4
CVM 6400 Diseases of Skin and Adnexa	3
CVM 6430 Cardiopulmonary System Diseases	4
CVM 6444 Ophthalmology	2
CVM 6460 Urinary Systems Disorders	2
CVM 6480 Obstetrics and Reproductive Diagnostics	1
Total.....	25

## Interession

CVM 6840 Swine Core	2
CVM 6880 Avian Core	2
Plus selected electives from Optional Elective Choices list shown on page 12	

## Third Year

### Fall Semester

CVM 6103	Veterinary Imaging II	2
CVM 6195	Veterinary Toxicology	3
CVM 6305	Clinical Skills V	1
CVM 6410	Digestive System	5
CVM 6420	Musculoskeletal System Diseases	2
CVM 6440	Nervous System Disorders	2
CVM 6451	Metabolic Disorders	3
CVM 6470	Multisystemic Diseases	3
CVM 6483	Reproductive Diagnostic Techniques	1
Total.....		22

### Required Elective Choices:

CVM 6104	Small Animal Special Procedures in Radiology	1
CVM 6136	Small Animal Nutrition Advanced Block	2.5
CVM 6306	Small Animal Clinical Skills Advanced Block	1
CVM 6404	Small Animal Dermatology Advanced Block	1
CVM 6414	Small Animal Liver and Pancreas Disorders Advanced Block	1
CVM 6424	Small Animal Orthopedic Advanced Block	1
CVM 6434	Critical Care Advanced Block	1
CVM 6436	Small Animal Cardiology	1
CVM 6442	Small Animal Behavior	1
CVM 6461	A Clinician's Analysis of Urinalysis	1
CVM 6464	SA Urinary Systems Disorders: Case Based Discussion	1
CVM 6482	Reproductive Diseases of Small Animals	1
CVM 6497	Avian Medicine and Surgery	1
CVM 6685	Small Animal Diagnostic Technique Lab	1
CVM 6702	Large Animal Palpation Labs	1
CVM 6704	Reproductive Diseases of Food Animals	2
CVM 6720	Problem Solving in Equine Medicine	1
CVM 6727	Equine Palpation Lab	1
CVM 6728	Reproductive Diseases of the Horse	1
CVM 6730	Equine Advanced Elective	3
CVM 6731	Equine Advanced Elective: Surgical Supplement	1
CVM 6790	Advanced Small Ruminant Practice	1
CVM 6791	Advanced Small Ruminant Practice Lab	1
CVM 6793	Small Ruminant Reproduction	.5
CVM 6800	Bovine Palpation Lab	1
CVM 6801	Dairy Production Medicine	1
CVM 6802	Large Ruminant Clinical Elective	3
CVM 6803	Advanced Bovine Practice Lab	2
CVM 6805	Food and Exotic Large Animal Anesthesia	.5
CVM 6841	Swine Behavior	1

### Optional Elective Choices:

CVM 6050	Perspectives: Interrelationships of People and Animals in Society	2
CVM 6307	Clinical Skills Elective	1
CVM 6443	Preparing and Teaching Puppy Classes	1.5
CVM 6481	Obstetrics Lab	1
CVM 6545	Introduction to Regulatory Medicine	2
CVM 6690	Integrative Medicine	2.5
CVM 6718	Large Animal Community Based Practice Mentoring	1
CVM 6721	Neonatology	1
CVM 6722	Clinical Anatomy of the Equine Limb	1
CVM 6930	Medical Management of Zoo Animals	1
CVM 6934	Selected Topics in Zoo Animal Medicine	5

### Spring Semester

CVM 6030	Public Health	2
CVM 6031	International Diseases	1
CVM 6042	Practice Management/Law and Ethics	2
CVM 6494	Small Animal Anesthesia Core	1
CVM 6495	Non-Traditional Pets	1
Total.....		7

In addition to the above spring semester requirements, students are required to

- participate in either a small or large animal hospital practicum.
- take at least 12 credits from the Required Elective Choices list. Elective choices are based on the selected track.
- successfully complete three clinical rotations.

Students must take at least 16 elective credits (with at least 12 during spring of year three). These credits can be in any combination from the Required Elective Choices and Optional Elective Choices lists. Credits taken during Intersessions also apply towards this requirement.



## Fourth Year (Summer, Fall, and Spring)

You'll begin by selecting a specific track. Each track has specific requirements, allowing us to create specialized learning experiences for you.

- Small animal—companion animals consisting mostly of cats and dogs.
- Food animal—bovine (dairy and beef), swine, and small ruminants
- Equine—for those wishing to be strictly equine veterinarians
- Mixed—a combination of small animal, food animal, and equine courses and rotations
- Interdisciplinary—for those wishing to do research, public health, etc.

All students are required to

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

### 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, anesthesiology, and radiology (required for all tracks)
- 3–5 two-week externships or rotations at other institutions, which occur off campus (required for all tracks except the interdisciplinary track)
- 7 selected rotations based on the track requirements (except the interdisciplinary track)
- 6–8 elective rotations or 18 electives for the interdisciplinary track

Students can choose from the following rotations to create their schedule:

### Comparative Services

Advanced Public Health  
Clinical Hematology, Cytology, and Microbiology  
Comparative Anesthesiology  
Comparative Ophthalmology  
Comparative Radiology  
Large Animal Anesthesia  
Minnesota Zoological Medicine  
Necropsy  
Private Practice Preparedness  
Raptor Center  
Veterinary Public Health  
Veterinary Acupuncture

### Equine

Equine Dentistry  
Equine Lameness  
Equine Podiatry  
Equine Sports and Preventive Medicine  
Equine Surgery  
Equine Theriogenology Introduction  
Equine Theriogenology Advanced  
Large Animal Diagnostic Ultrasonography

### Food Animal

Advanced Building Design  
Advanced Feedlot Herd Health  
Applied Dairy Nutrition  
Biosecurity (Dairy Disease/Treatment Protocols)  
Biosecurity in the Poultry Industry  
Bovine Surgery  
Cow Calf Herd Health and Production  
Dairy Palpation  
Dairy Record Analysis, Epidemiology  
and Economics  
Epidemiology and Biostatistics  
Farm Animal Reproduction and Delivery  
Management  
Mastitis Milking Machines and Milk Quality  
Ruminant Nutrition  
Swine Records  
Small Ruminant Health and Production  
Swine Disease Diagnostics, Therapeutics,  
and Prevention  
Swine Economics, Financial Management,  
and Marketing  
Swine Production Systems  
Swine Production Training  
Transition Dairy Cow Management  
and Clinical Care  
Young stock and Dairy Production Medicine

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*“The program gets students into the clinics, receiving hands-on medical experience with animals—both large and small—right away during the first year.”*

*Angie, Class of 2006  
Crystal, MN*

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### Large Animal

Large Animal Medicine  
Large Animal Surgery

### Other

Directed Studies—Pathobiology  
Directed Studies—Diagnostic Medicine  
Directed Studies—Large Animal  
Directed Studies—Small Animal  
External Rotation in Public Veterinary Practice  
Externship  
Masters Project: Public Health Practice  
Public Policy  
Rotation at Other Institutions

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*“There are so many great things about this vet school!  
The integrated curriculum is awesome and helps  
students learn topics well once as opposed to simply  
memorizing them over and over again.”*

*Melissa, Class of 2005  
Richfield, MN*

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### Small Animal

Advanced Clinical Oncology  
Behavior  
Cardiology  
Community Practice  
Companion Birds  
Critical Care  
Dermatology  
Elective Small Animal Surgery  
Emergency Rotation  
Neurology  
Small Animal Clinical Nutrition  
Small Animal Internal Medicine  
Small Animal Surgery  
Small Animal Theriogenology  
Small Animal Ultrasound  
Veterinary Dentistry Rotation

## Academic Policies

### Academic Calendar

The University follows a semester schedule, with fall semester beginning in September, spring semester beginning in January, and summer semester beginning in May. The college offers required and elective courses during its intersession at the end of the first and second years of the D.V.M. program.

### Access to Educational 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.) Some information—name, address, e-mail address,

telephone number, dates of enrollment, and enrollment status (full-time, part-time, not enrolled, withdrawn, and date of withdrawal), college and class, major, adviser, academic awards and honors received, and degrees earned—is considered public or directory information. You can prevent the release of public information by notifying the records office on your campus.

You have the right to review your educational records and to challenge their contents. To learn more about this process, visit [www.onestop.umn.edu/Grades/gradereporting/privacy.html](http://www.onestop.umn.edu/Grades/gradereporting/privacy.html), write to the Registrar at 200 Fraser Hall, Minneapolis, MN 55455, or call 612-624-1111. You can also contact the records office on other campuses of the University.

### Animal Use

The college uses animals in the D.V.M. curriculum to illustrate medical principles and provide students with critically needed firsthand experience in the art of veterinary medicine and surgery. The animals are treated with dignity and genuine concern for their welfare. In some cases, they eventually must be euthanized in accordance with the Animal Welfare Act.

Finding humane and effective alternatives to animal use is a college priority. The college continually evaluates how it teaches clinical skills, and continues to add to the progress it already has made in refining, reducing and sometimes eliminating animal use in its courses. Among other improvements, the college has developed an innovative partnership with the local humane society, under which students can get extensive experience in neuter and spay surgeries to make the animals more adoptable. Students may serve on the college's animal use committee that considers new alternatives while preserving the effectiveness of the educational process.

At the same time, the college wants to make sure prospective students know that the D.V.M. curriculum requires learning experiences with both live and cadaver animals. The University's animal care committee reviews all courses and determines the appropriateness of using animals in each course.

### Attendance and Examinations

You're expected to attend all scheduled classes and instructional sessions unless they are specifically identified as optional. If you need to miss a class, you're responsible for all material presented in the course whether or not the material is included in notes or other printed materials. You have a responsibility to inform the instructor if you must miss a scheduled examination, quiz, or deadline for anything that will count toward your grade. Requests for individual rescheduling of examinations or assignment deadlines must be approved by the instructor. For more information about the policy on attendance and examinations, contact the Office of Academic and Student Affairs.



### **Catalog Use**

The information in this catalog and other University catalogs, publications, or announcements is subject to change without notice. University offices can provide current information about possible changes. This publication is available in alternative formats on request. Contact the Office of Admissions, University of Minnesota, 240 Williamson Hall, 231 Pillsbury Drive S.E., Minneapolis, MN 55455, 612-625-2008, e-mail [admissions@umn.edu](mailto:admissions@umn.edu).

This catalog is available online at [www.catalogs.umn.edu/vetmed/index.html](http://www.catalogs.umn.edu/vetmed/index.html).

### **Degree Requirements**

The doctor of veterinary medicine degree is awarded following the satisfactory completion of the four-year professional curriculum with a grade point average of 2.00 or above.

The Ph.D. or M.S. degrees are awarded according to the Graduate School policies.

### **D.V.M. Honor System**

An honor system operates on the assumption that students are honest. That's why students, rather than faculty, monitor examinations. Students are trusted not to give or receive aid during examinations and are responsible for their own honesty.

The Honor Case Commission, composed of students elected from the four classes, confidentially considers reports of suspected acts of dishonesty during

examinations. The commission may request a hearing to determine if scholastic dishonesty has occurred. If so, four faculty representatives are selected by the dean and the Faculty Council to form a Student-Faculty Honor Case Commission that will participate in the hearing. If they determine that the student involved is guilty, an appropriate penalty will be determined and referred to the dean for implementation. In addition to the Honor Code the College of Veterinary Medicine expects its students to abide by the University of Minnesota's Student Conduct Code.

### **D.V.M. Readmission**

As a D.V.M. student, if you're dropped from the program, you need permission of the Admissions and Scholastic Standing Committee to be reinstated. Credits earned at other institutions during suspension will not apply toward graduation from the University unless advance permission is received from the Admissions and Scholastic Standing Committee. Readmission to the college is at the discretion of the Admission and Scholastic Standing Committee with consent of the faculty.

If readmission is granted, the Admissions and Scholastic Standing Committee will determine the courses to be repeated and the level of performance that must be achieved. Failure to achieve these requirements will result in permanent dismissal from the professional curriculum. If permitted to return, you will be placed on probation and may be dropped at any time if your work is unsatisfactory.



### **D.V.M. Scholastic Requirements**

You must maintain a grade point average (GPA) of at least 1.50 for any single semester and earn a passing grade in each course. If you fail to achieve a GPA of at least 1.50 or receive a grade of F or N (no credit) in any single semester in a required course or clinic rotation, you will be dropped from the professional curriculum. If you have a semester GPA lower than 2.00, you will be placed on probation. You will not be allowed to proceed from one semester to the next on academic probation for more than three semesters. If your semester GPA is less than 2.00 four times during any block of five consecutive semesters, you'll be dropped from the professional curriculum. You must achieve a GPA of 2.00 at the end of each academic year to continue in the professional curriculum and to earn the D.V.M. degree.

If you've completed a course or courses similar or identical to those required in the D.V.M. curriculum, you can petition the Admissions and Scholastic Standing Committee to substitute for that requirement. Forms for this purpose are available in the Academic and Student Affairs Office, 460 Veterinary Teaching Hospital.

### **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.

Questions about compliance may be directed to Julie Sweitzer, director, Office of Equal Opportunity and Affirmative Action, University of Minnesota, 419 Morrill Hall, 100 Church Street S.E., Minneapolis, MN 55455, 612-624-9547.

### **Equipment**

As a D.V.M. student you will be required to have a 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.

### **Grading and Transcript Policy**

The University has two grading systems, A-B-C-D-F (with pluses and minuses) and S-N. You may receive grades only from the grading system under which you have registered for a course.

Each campus, college and department determines to what extent and under what conditions each grading system is used, may specify what courses or proportion of courses must be on one system or the other, and may limit a course to either system.

The University's official transcript, the chronological record of your enrollment and academic performance, is released by the University only at your request or in accordance with state or federal statutes; mailed copies have the University's official seal printed on them. You may obtain an unofficial transcript, except when you have a transcript hold on your record.

To learn more about grading and transcript policies, [www.onestop.umn.edu](http://www.onestop.umn.edu)

### **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

### **Immunization**

Students born after 1956 who take more than one University class are required under Minnesota law to submit an Immunization Record.

### **Registration**

If you're a D.V.M. student you'll receive complete registration information from the Office of Academic and Student Affairs each term.

M.S/Ph.D. students will register online each term according to the requirements of their program and the Graduate School.

## Veterinary Medicine (CVM)

**CVM 1000. Introduction to Veterinary Medicine.** (1 cr; S-N only)  
History of veterinary profession, careers within the profession, employment trends. Information about admission to DVM. Veterinary technology programs.

**CVM 6000. Orientation to Veterinary Medicine.** (3 cr; S-N only. Prereq—CVM 1st yr or CVM transfer) Introduction to academic and professional skills necessary for success in the veterinary curriculum and profession. Three-day pre-class orientation. Peer and faculty mentorship network.

**CVM 6011. Professional Skills I.** (2 cr; A-F only. Prereq—DVM 1st yr) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

**CVM 6012. Professional Skills II.** (2 cr; A-F only. Prereq—DVM 1st yr or #) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

**CVM 6013. Professional Skills III.** (2 cr; A-F only. Prereq—DVM 2nd yr or #) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

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

**CVM 6021. Overview of Animal Populations I.** (1 cr; S-N only. Prereq—DVM 1st yr or #) Introduction to U.S. production animal agriculture at individual producer level and to roles veterinarians play.

**CVM 6022. Overview of Animal Populations II.** (1 cr. Prereq—DVM 1st yr or #) Introduction to U.S. production animal agriculture at individual producer level and to roles veterinarians play.

**CVM 6028. Large Animal Hospital Practicum.** (4 cr [max 12 cr]; S-N only. Prereq—3rd or 4th yr DVM or #) Experience in team leadership in procedures/policies involved in after hours care of hospitalized/emergency cases in large-animal hospital.

**CVM 6029. Small Animal Intensive Care Practicum.** (1 cr [max 2 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Management of dogs/cats requiring urgent medical care, intensive medical management. Provide primary case care and service support through patient evaluation, problem solving, health care delivery, equipment operation. Practicum is served in Small Animal Intensive Care Unit.

**CVM 6030. Veterinary Public Health.** (2 cr; A-F only. Prereq—6201, 6202, 6220) 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; S-N only. 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 only. Prereq—DVM or #) Economic, marketing, personnel management, accounting issues in veterinary practice management. Legal/ethical parameters for veterinary practice. Attendance required.

## Course Symbols

..... 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.

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

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

□ ..... Approval of the college offering the course is required for registration.

DGS.. Director of Graduate Studies.

NGA.. No grade associated. Course may be taken A-F or S-N.

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

A class rank prerequisite (e.g., 3rd yr) states the minimum class standing a student must hold to register for a course without special permission from the Academic Standing Committee.

**CVM 6045. Private Practice Preparedness.** (2 cr [max 6 cr]; A-F only. Prereq—3rd or 4th yr DVM or #) Pet wellness, human resources, supervision, finance, customer service, conflict management, marketing.

**CVM 6046. Practice Readiness I.** (2 cr [max 8 cr]; S-N only. Prereq—[3rd or 4th] yr DVM or #) Well pet care, practice options, teamwork, economic impact. Preventive care for all life stages, including pet selection, dental prophylaxis/immunizations. Wellness concept, framework for euthanasia appointment, customer service, veterinary/team roles. Lengthening well lives of pets. Legislative process: how veterinary/professional organizations can be involved. Selecting a practice. Resume, interview skills. Professional dress code.

**CVM 6050. Perspectives: Interrelationships of People and Animals in Society.** (2 cr) Interrelationships of people/animals. Social, economic, health consequences. Pets/people sharing urban environment, animal rights, influence of cultural differences on animal-human relationships.

**CVM 6051. Human-Companion Animal Bond: Attachments and Losses, Communications, Ethics, and Service.** (1 cr; S-N only. Prereq—1st or 2nd yr DVM or #) Human-Companion animal bond activities/services. Emphasizes helping clients, particularly at time of actual or anticipated death of companion animals. Communication/counseling skills.

*“The University of Minnesota’s program is one-of-a-kind. I’ll be earning two degrees in four years (D.V.M./M.P.H.), which will help my career immensely. I am truly glad I chose the U of M for my veterinary education.”*

*Heather, Class of 2006  
Chicago Heights, IL*

**CVM 6052. Grief, Human Animal Bond, Communication Elective.** (1 cr; S-N only. Prereq—DVM or #) Veterinarians’ role in recognizing/managing aspects of human-animal bond. Grief management, client present euthanasia, closure, staff relations, work-life balance, communicating in special situations. Communicating with co-workers/staff in practice setting.

**CVM 6100. Veterinary Gross Anatomy.** (5 cr; A-F only. Prereq—DVM 1st yr or #) Gross anatomy of domesticated mammals, including development anatomy. Carnivore portion features dog as a model animal and comparatively the cat. Ungulate portion focuses on basic equine anatomy and includes clinically important ruminant/swine anatomy.

**CVM 6101. Normal Radiographic Anatomy.** (1 cr; A-F only. Prereq—1st yr DVM or #) Introduction to radiological principles. Radiation safety, radiographic technique, patient positioning. Emphasizes mastery of normal radiographic anatomy. Identifying anatomic structures on normal plain films and on special-contrast procedure radiographs. Lectures, guided laboratory exercises.

**CVM 6112. Organology.** (3 cr; A-F only. Prereq—[6111, DVM 1st yr] or #) Microscopic/ultrastructural morphology of organ systems (cardiovascular, gastrointestinal, respiratory, urinary, endocrine) in mammalian domestic species.

**CVM 6120. Veterinary Neurobiology.** (2 cr; A-F only. Prereq—DVM 1st yr or #) Anatomy and physiology of central nervous system (brain, spinal cord) and special senses (eye, ear, olfaction, taste).

**CVM 6130. Veterinary Physiology.** (4 cr; A-F only. Prereq—DVM 1st yr or #) Fundamental principles of systemic physiology. Relationships between forces and flows in biological systems. Overview of control system theory as it relates to neurohormonal regulation. Survey of major organ systems.

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

**CVM 6134. Principles of Veterinary Nutrition.** (1 cr; A-F only. Prereq—DVM 1st yr or #) Introduction to principles of nutrition. Basic applications and food sources for major domestic species.

**CVM 6136. Small Animal Nutrition: Advanced Block.** (2.5 cr. Prereq—3rd yr DVM or #) Nutritional considerations in health, treatment of disease in small animals.

**CVM 6137. Small Animal Clinical Nutrition.** (2 cr [max 6 cr]; S-N only. Prereq—3rd or 4th yr DVM or #) Students manage nutritional needs of patients, perform nutritional assessments of all ICU patients, perform nutritional consults, and see outpatient appointments.

**CVM 6141. General Veterinary Pharmacology.** (2 cr; A-F only. Prereq—DVM 1st yr or #) Principles of drug action, disposition, and clinical applications in animal patients. Therapeutic uses of drugs affecting autonomic nervous system, cardiovascular system, respiratory/digestive tracts, and kidneys. Therapeutic uses of anti-allergic/anti-inflammatory drugs.

**CVM 6142. Veterinary Neuropharmacology.** (1 cr; A-F only. Prereq—DVM 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 only. Prereq—3rd yr DVM or #) Toxicology of minerals, pesticides, venoms, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.

**CVM 6201. Host Defenses.** (3 cr; A-F only. Prereq—DVM 1st yr or #) Introduction to classification, morphology, reproductive cycle, and epidemiology of infectious microbial agents of veterinary importance; properties of disinfectants; therapeutic uses of chemicals and drugs for sterilization, control, and treatment. CVM 6202. Infectious Agents: Parasitology. (4 cr; A-F only. 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 6203. Infectious Agents: Bacteriology.** (3.5 cr; A-F only. Prereq—DVM 2nd yr or #) Veterinary medical microbiology/mycology. Mechanisms of pathogenesis, clinical presentations, diagnostic approaches, host responses to infectious challenge. Prevention, treatments. Laboratory exercises are used to test students' ability to isolate/define potential bacterial pathogens.

**CVM 6204. Infectious Agents: Virology.** (1.5 cr; A-F only. Prereq—DVM 2nd yr or #) How virus and host factors interact. How these interactions lead to disease or recovery. Applications to prevention/management of disease.

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*“My experience during the program was wonderful. I think dedication, motivation, enthusiasm, and a participative adviser are all important keys for a successful project and these were all present in my program.”*

*Sandra, DVM, VMed Graduate Student  
Brazil*

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**CVM 6102. Veterinary Imaging Part 1.** (2 cr; A-F only. Prereq—[6100, 6101, 2nd yr DVM] or #) Introduction to physics of radiology. Radiographic principles/techniques. Cardiopulmonary/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 only. Prereq—[6100, 6101, 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 6104. Small Animal Special Procedures in Radiology: Advanced Block.** (1 cr; S-N only. Prereq—[3rd or 4th] yr DVM or #) Common contrast studies used in small animal practice.

**CVM 6110. Veterinary Biochemistry.** (3 cr; A-F only. Prereq—DVM 1st yr or grad student in biological or biomedical sciences) Structure/function of cells/tissues. Mechanisms by which animals digest, absorb, and metabolize carbohydrate, protein, lipid, and nucleic acids. Use of absorbed molecules to derive energy and maintain physiological processes. How end products are created/eliminated. Role of hormones and metabolically active tissues. Metabolic abnormalities. Recombinant DNA applications. Molecular aspects of growth/regulation of gene expression.

**CVM 6111. Cells and Tissues.** (3 cr; A-F only. Prereq—DVM 1st yr or #) Introduction to light/electron microscopic structure of cells, tissues, and certain organs. How cells associate to perform specialized functions. How organized groups of cells (i.e., tissues) are arranged to form organ systems of the body.



**CVM 6205. Infectious Agents: Pharmacology.** (1 cr; A-F only. Prereq—DVM 2nd yr or #) Clinical pharmacology of anti-microbial, antifungals, and anthelmintics used in veterinary medicine. Mechanisms of action, development of resistance and comparative anti-rejection spectrum of agents in their drug classes.

**CVM 6211. Applied Veterinary Genetics.** (1 cr; A-F only. Prereq—1st yr DVM or #) Overview of general, molecular, and cytogenetics relevant to animal health, disease, breeding, and production. Emphasizes how genetic information is acquired/used in veterinary medicine and animal agriculture.

**CVM 6220. Clinical Epidemiology.** (2 cr; A-F only. Prereq—DVM 2nd yr or #) Statistical and epidemiological concepts applied to veterinary medicine.

**CVM 6300. Veterinary Pathology.** (7 cr; A-F only. Prereq—DVM 2nd yr or #) Reactions of cells and tissues to injury and disease, including reversible and irreversible cell injury, disturbances of circulation, blood coagulation, and alterations of cell growth and multiplication. Pathology of body systems, emphasizing reactions of specific organs.

**CVM 6301. Clinical Skills I.** (1 cr; A-F only. Prereq—DVM 1st yr or #) Domestic animal behavior. Basic animal handling/management skills. Clerk duty in both large- and small-animal hospitals is required. First of five-part series.

**CVM 6302. Clinical Skills II.** (1 cr; A-F only. Prereq—DVM 1st yr or #) Domestic animal behavior. Basic animal handling/management skills. Introduction to hospitals. Both small- and large-animal clerk duty is required.

**CVM 6303. Clinical Skills III.** (1 cr; S-N only. Prereq—DVM 2nd yr or #) Domestic animal behavior. Basic animal handling and management skills.

**CVM 6304. Clinical Skills IV.** (1 cr; S-N only. Prereq—DVM 2nd yr or #) Domestic animal behavior. Basic animal handling and management skills.

**CVM 6305. Clinical Skills V.** (1 cr; S-N only. 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 4” daily ICUC tests.

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

**CVM 6307. Clinical Skills Elective.** (1 cr; S-N only. Prereq—[6301, 6302] or #) Hands-on clinical skills. History taking, physical exam, basic/intermediate technical procedures on small animals. Skills are practiced at several approved locations.

**CVM 6312. Veterinary Dental Rotation.** (2 cr [max 12 cr]; S-N only. Prereq—DVM 3rd or 4th yr student or #) Routine/complex dental problems. Students diagnose and formulate treatment plans. Hands-on training. Basic periodontal procedures, single/multi-rooted extractions, dental radiographic techniques, instrument/equipment care, dental charting.

**CVM 6321. Surgery, Anesthesiology, Critical Care.** (4 cr; A-F only. Prereq—DVM 2nd yr or #) Introduction to principles/techniques for conducting surgical procedures, managing uncomplicated anesthesia, and providing critical care for common situations in large/small animal species.

**CVM 6400. Skin and Adnexa.** (3 cr; A-F only. Prereq—DVM 2nd yr or #) Normal form and function, histopathologic reaction patterns, wound healing, and clinical disease states of the skin and adnexa (horns, mammary glands) of common domestic species.

**CVM 6404. Small Animal Dermatology: Advanced Block.** (1 cr; A-F only. Prereq—[3rd or 4th] yr DVM or #) Diagnostic/therapeutic considerations in small animal dermatology beyond core in preparation for clinical rotations.

**CVM 6410. Digestive System.** (5 cr; A-F only. Prereq—DVM 2nd yr or #) Pathophysiology, diagnostic methods, therapeutic procedures, and preventative/management protocols for common disorders of the oral cavity and digestive tract in major domestic species.

**CVM 6414. Small Animal Liver/Pancreas Disorders: Advanced Block.** (1 cr; A-F only. Prereq—[3rd or 4th] yr DVM or #) Complicated diabetes mellitus, feline pancreatitis, and hepatic encephalopathy in dogs/cats. Lectures, small-group exercises.

**CVM 6416. Small Animal Gastrointestinal Endoscopy.** (.5 cr. Prereq—[3rd or 4th] yr DVM or #) Endoscopic diagnosis/treatment of small animal diseases.

**CVM 6420. Musculoskeletal System Diseases.** (2 cr; A-F only. Prereq—DVM 3rd yr or #) Presentation, pathophysiology, diagnostic, and therapeutic/management approaches for common disorders of locomotion.

**CVM 6424. Small Animal Orthopedic: Advanced Block.** (1 cr; A-F only. Prereq—[3rd or 4th] yr DVM or #; non-track students may audit lectures, but labs must be taken for grade) Dog/cat pediatric, adult orthopedic problems frequently seen in clinical practice. For comparative information, selected human orthopedic problems are presented by guest lecturers. Attendance/participation required for grade.

**CVM 6430. Cardiopulmonary System Disorders.** (4 cr; A-F only. Prereq—DVM or #) Pathophysiology, presentation, diagnostic presentation, therapeutic approaches, and management protocols for common disorders of the cardiovascular and pulmonary systems.

**CVM 6433. Hematology Elective.** (.5 cr; S-N only. Prereq—3rd yr DVM or #) Case based experience in interpreting/using hematology/chemistry results for small animals.

**CVM 6434. Critical Care: Advanced Block.** (1 cr; S-N only. Prereq—[3rd or 4th] yr DVM or #) Case-based discussions of common emergencies: trauma, toxins, acute abdomen, hematologic, 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 only. 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 only. Prereq-DVM 3rd yr or #) Pathophysiology, presentation, diagnostic approach, therapeutic approach, and management protocol for common neurologic/ophthalmologic disorders in domestic species.

**CVM 6452. Metabolic Disorders II.** (3 cr; A-F only. Prereq-DVM 3rd yr or #) Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, and management protocols for metabolic and endocrine based disorders of domestic species.

**CVM 6460. Urinary System Disorders.** (2 cr; A-F only. Prereq-2nd yr DVM or #) Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, and management protocol for common disorders of the urinary system in domestic species.

**CVM 6461. A Clinician's Analysis of Urinalysis.** (1 cr; S-N only. Prereq-3rd yr DVM or #) Informal, case-based, interactive, in-depth approach to evaluation of urinalyses of clinical cases recently admitted to Veterinary Teaching Hospitals. Improving observational/interpretation skills. Recognizing invitro factors that may alter results of urinalyses.

**CVM 6464. Small Animal Urinary System Disorders: Case Based Discussion.** (1 cr; S-N only. Prereq-[3rd or 4th] yr DVM or #) Expands on disorders of small animal urinary system. Introduction to core/additional disorders.

**CVM 6470. Multisystemic Diseases.** (3 cr; A-F only. Prereq-DVM 3rd yr or #) Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, and management protocol of disorders of the immunologic and hematologic systems and of multisystemic infectious diseases.

**CVM 6480. Obstetrics.** (1 cr; A-F only. Prereq-2nd yr DVM or #) Diagnosis/management of reproductive diseases.

**CVM 6481. Obstetrics Lab.** (1 cr; A-F only) Techniques for pregnancy diagnosis, obstetric manipulation in large animal species.

**CVM 6482. Reproductive Diseases of Small Animals.** (1-2 cr [max 2 cr]; A-F only. Prereq-3rd yr DVM or #) Physiology/pathology of reproduction, artificial insemination, abortive diseases, postpartum injuries, and breeding management in small animals, horses, and small ruminants. Students focus on 1-3 species. At least 10 hours per credit.

**CVM 6483. Reproductive Diagnostic Techniques.** (1 cr; A-F only. Prereq-3rd yr DVM or #) Obstetric manipulation in domestic species.

**CVM 6494. Small Animal Anesthesia Advanced Block Core.** (1 cr. 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 6495. Non-Traditional Pet Core.** (1 cr; A-F only. Prereq-3rd yr DVM or #) General/reproductive biology, behavior, husbandry, nutrition, handling, restraint, anesthesia. Common diseases, 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 6497. Avian Medicine and Surgery: Advanced Block.** (1 cr. Prereq-[3rd or 4th yr] DVM or #) Bacterial, viral, fungal, parasitic diseases of companion birds. Caged birds, psittacines, raptors, racing pigeons, waterfowl. Behavioral components of common management problems (screaming, biting, feather picking, pathological bonding). Clinical methods of capture/restraint, anesthesia, radiology. Collecting samples for lab analysis. Overview of problems managed surgically.

**CVM 6498. Food Animal and Exotic Large Animal Anesthesia.** (.5 cr; A-F only. Prereq-[3rd or 4th yr] DVM or #) Restraint, sedation, immobilization of ruminants/pigs. Regional techniques, special considerations for anesthesia. Injectable food animal anesthesia, anesthesia of llamas, ostriches, elk, other exotic large animal species.

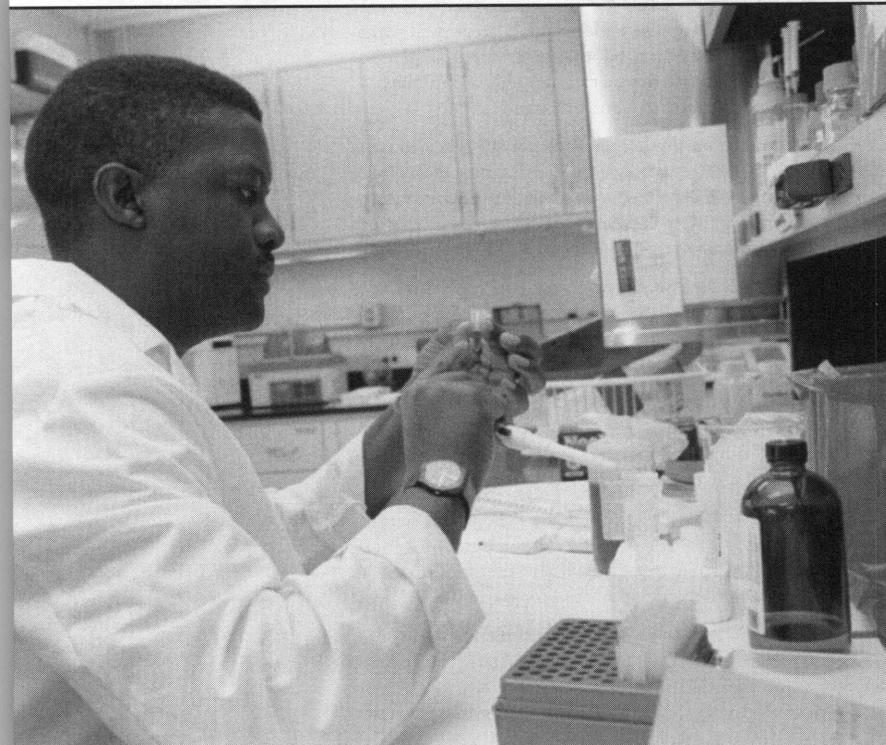
**CVM 6441. Behavior Core.** (2 cr; A-F only. Prereq-3rd yr DVM student or #) Ethology, small/large animal behavior, human-animal bond, behavior medicine, psychopharmacology, behavior genetics, learning theory, behavior modification.

**CVM 6442. Animal Behavior Elective: Advanced Block.** (1 cr; S-N only. Prereq-[3rd or 4th] yr DVM or #) Introduction to abnormal/undesired animal behavior, diagnostic procedures, and behavioral/pharmacological modifications.

**CVM 6443. Preparing and Teaching Puppy Classes.** (1.5 cr [max 2 cr]; S-N only. Prereq-[DVM 1st or 2nd yr or #], commitment to teach at least 5 Wed nights following completion of course; prev dog training experience recommended) Prepares students to teach in CVM puppy classes offered to public. Puppy socialization, reward-based training, pitfalls of using punishment, canine learning principles. Management of common puppy problems during ages 7 to 20 weeks. Students observe puppy classes and practice presentations. Lecture, lab.

**CVM 6444. Ophthalmology.** (2 cr; A-F only. Prereq-[3rd or 4th yr] DVM or #) Common procedures for evaluation, diagnosis, treatment of eye disorders in domestic species.

**CVM 6451. Metabolic Disorders.** (3 cr; A-F only. Prereq-DVM 2nd yr or #) Endocrine/metabolic diseases of all species. Unique metabolic problems of large animals. Pediatrics/geriatrics of companion animals. Oncological diseases of companion/large animals.



**CVM 6500. Veterinary Public Health.** (1 cr [max 6 cr]; S-N only. Prereq—DVM 3rd or 4th yr 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, conduct occupational safety/hazard review, present findings.

**CVM 6501. Advanced Veterinary Public Health: Food Systems.** (1 cr [max 4 cr]; A-F only. Prereq—DVM or MPH or grad student or #) Systems used to raise livestock/poultry, deliver through markets to slaughter or processing facilities, and deliver to consumers. Methods to assess/mitigate risks. Emphasizes public health/food safety issues. Field trips, problem solving, assignments.

**CVM 6502. Necropsy.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Students perform necropsies, collect tissues for laboratory analysis, interpret clinicopathologic findings, prepare reports on animals submitted to Veterinary Diagnostic Laboratory, apply basic/clinical science to diseases for individual animals and populations of animals. Students may participate in history taking. Case findings discussed daily. Student groups present case reports in PowerPoint format at one weekly departmental seminar.

**CVM 6505. Topics.** (1-8 cr [max 40 cr]. Prereq—#) New or one-time-only course.

**CVM 6506. Directed Studies in Large Animal Medicine.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 4th yr or #) Students, under guidance of a faculty member, conduct special project addressing an issue in large animal medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser and approval by CVM's curriculum committee.

**CVM 6507. Directed Studies in Small Animal Medicine.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 4th yr or #) Students, under guidance of a faculty member, conduct special project addressing an issue in small animal medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser and approval by CVM's curriculum committee.

**CVM 6508. Directed Studies: Pathobiology.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 4th yr or #) Students, under guidance of a faculty member, conduct special project addressing an issue in veterinary pathobiology. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser and approval by CVM's curriculum committee.

**CVM 6509. Directed Studies: Diagnostic Medicine.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 4th yr or #) Students, under guidance of a faculty member, conduct special project addressing an issue in diagnostic medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by faculty adviser and approval by CVM's curriculum committee.

**CVM 6510. Master's Project: Public Health Practice.** (2 cr [max 9 cr]; S-N only. Prereq—DVM student or #) Cytology, hematology, clinical chemistry, urinalysis, clinical microbiology, endocrinology, virology, parasitology, immunology. Sample submission, laboratory test methodology. Covers all veterinary species. Emphasizes comparative laboratory medicine. Case-based learning, small group discussions, didactic teaching, microscopy.

**CVM 6515. Externship.** (2 cr [max 24 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Students spend two weeks/rotation in a practice or other professional setting.

**CVM 6516. Externship in Public Health Practice.** (1-3 cr [max 9 cr]; S-N only. Prereq—DVM student or #) Directed field experience or clinical rotation/practicum in selected community or public health agencies/institutions. Integration of knowledge/skills in population science for public health.

**CVM 6517. External Rotation in Public Veterinary Practice.** (2 cr [max 6 cr]; S-N only. Prereq—DVM 1st or 2nd or 3rd or 4th yr or MPH student or #) Directed field experience or clinical rotation/practicum in selected public veterinary agencies/institutions. Integration of knowledge/skills in population science for public veterinary practice.

**CVM 6518. Public Policy.** (1-2 cr [max 6 cr]; S-N only. Prereq—DVM 1st or 2nd or 3rd or 4th yr or MPH student or grad student or [jr or sr] animal sci student or #) Directed experiential learning in public policy making at state, national, or international level. Integration of knowledge/skills in animal health, public health, and food safety policy development. Travel may be required. Some financial support may be available. Occurs 1st or 2nd week of January or over summer. Faculty are oversee students.

**CVM 6525. Rotation at Other Institution.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 4th yr or □) Students to spend one-six weeks in an organized program at another degree-granting institution, in an area either not offered at the University or in one that complements experience in a clinical rotation at the University.

**CVM 6532. Labs: Clinical Hematology, Cytology, and Microbiology.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Cytology, hematology, clinical chemistry, urinalysis, clinical microbiology, endocrinology, virology, parasitology, immunology. Sample submission, laboratory test methodology. Covers all veterinary species. Emphasizes comparative laboratory medicine. Case-based learning, small group discussions, didactic teaching, microscopy.

**CVM 6540. Advanced Veterinary Toxicology.** (2-8 cr [max 40 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) In-depth examination of toxins. Clinical, diagnostic, mechanistic, and therapeutic aspects of biotoxins, organic, and inorganic toxins that affect livestock, poultry, wildlife, and companion animals or that threaten public health.

**CVM 6545. Introduction to Regulatory Medicine.** (2-4 cr; A-F only. §Txl 6545. 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.

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*"The faculty is extremely supportive of their students. The University of Minnesota allows veterinary students multiple opportunities to conduct or assist in research projects."*

*Amanda, Class of 2005  
Grand Meadow, MN*

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**CVM 6601. Small Animal Internal Medicine.** (2 cr; S-N only. 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 relate 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 6630. Behavior.** (2 cr [max 16 cr]; S-N only. 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, discussion of problem complexes.

**CVM 6632. Dermatology.** (2 cr [max 40 cr]; S-N only. 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/management of cases. Small-group discussions.

**CVM 6634. Comparative Ophthalmology.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Entry-level ophthalmology. Diagnosis, treatment. Outside readings, review papers, final essay exam.

**CVM 6636. Cardiology.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 4th yr or CVM grad or #) Clinical problem solving. Cases of cardiopulmonary disease, including canine/feline congenital heart disease, acquired valvular/myocardial disease, dirofilariasis, arrhythmias, pulmonary disorders. Hands-on experience in conducting physical exams, recording electrocardiograms/echocardiograms, and reading thoracic radiographs. Group discussions, rounds.

**CVM 6640. Clinical Companion Animal Nutrition.** (4 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Companion-animal clinical nutrition. Pet food industry. Using label information to evaluate different brands of food. Nutritional requirements of normal dogs and cats. Guidelines for answering client questions about nutrition. Nutritional management of selected diseases and therapeutic diet options. Enteral and parenteral methods of nutritional support. Nutritional plans for companion animals with various diseases.

**CVM 6644. Community Practice.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Companion animal preventative health care, behavior, and husbandry. Emphasizes client communication/euthanasia issues. Work with community practice veterinarian on non-referred cases within Veterinary Medical Center. Daily rounds focusing on immunizations, behavior, infectious diseases, human-animal bond, and communication.

**CVM 6645. Business Aspects of Veterinary Practice.** (2 cr; S-N only. Prereq—3rd or 4th yr DVM or #) Human resources issues, supervision, use of Myers-Briggs, finance, customer service, conflict management, marketing. Real-world studies. Case studies, primarily from Veterinary Medical Center. Lectures, small group work.

**CVM 6648. Advanced Clinical Oncology Rotation.** (2 cr; S-N only. Prereq—DVM 3rd or 4th yr or grad student or #) Case management, self-directed research. Students receive oncology referrals, work with 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 6602. Small Animal Internal Medicine.** (2 cr [max 52 cr]; S-N only. 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 rounds discussions. Students assist clinicians in management of referral/emergency cases. Cases typically related to gastroenterology, nephrology, urology, oncology, nutrition, neurology, and cardiology.

**CVM 6603. Small Animal Internal Medicine.** (2 cr [max 8 cr]; S-N only. Prereq—[6601, 6602, [3rd or 4th yr DVM], small animal track] or #) Students work with internal medicine clinical specialists in VTH, assisting with receiving, patient care, work-ups, and client communication. Students provide patient care on evenings/weekends for hospitalized patients, similar to cases assigned in SAM. High volume rotation designed to provide high quality service to referring community.

**CVM 6606. Emergency Rotation.** (2 cr [max 40 cr]; S-N only. Prereq—DVM or #) Evening/weekend ER service. Medical/surgical emergency/traumatic cases. Students assist staff clinicians/interns in diagnosis and case management. Triage, history taking, physical examination, 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]; S-N only. Prereq—3rd or 4th yr DVM or #) Primary case care for ICU patients. Some emergency receiving. Daily rounds, including case discussion and critical care topics. Limited case care responsibility, including SOAPs and treatment orders on existing patients. Students present a short rounds discussion on critical care topic of their choice.

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*“A key factor in my decision to apply solely to the University of Minnesota was the potential to complete a combined D.V.M./Ph.D. program. In hindsight, I am astounded that I took such an incredible risk, one that I would eagerly take again.”*

*Lisa, Class of 2005  
Winnipeg, Manitoba Canada*

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**CVM 6651. Small Animal Ultrasound.** (2 cr [max 16 cr]; S-N only. Prereq-3rd or 4th yr DVM or #) Students scan normal cats/dogs and assist with clinical patient scanning. Ultrasound equipment, small animal planar abdominal anatomy. Abdominal ultrasonography and abdominal masses. Sonographic assessment of liver, spleen, pancreatic diseases, upper urinary tract, lower urinary tract, prostate gland, uterus, ovary, testicles, eyeball, and abdominal effusions. Students interpret ultrasonograms with radiologist. Emphasizes integrated imaging approach.

**CVM 6661. Neurology.** (2 cr [max 4 cr]; S-N only. Prereq-3rd or 4th yr DVM or #) Medical/surgical neurology. Providing complete neurological service for clients, patients, and hospital. Integration into all aspects of service, including receiving, work up, surgery, care, communications, and discharges.

**CVM 6662. Comparative Anesthesiology.** (2 cr [max 4 cr]; S-N only. Prereq-DVM 3rd or 4th yr) Practical experience in sedating/anesthetizing routine clinical cases. Previously taught lab protocols/techniques are used in healthy normal clinical cases and adapted for high risk cases. Emphasizes problem solving in formulation of anesthetic plans, management of patients under anesthesia, team work, and pain management.

**CVM 6663. Small Animal Surgery.** (2 cr [max 4 cr]; S-N only. Prereq-DVM 3rd or 4th yr or #) Diagnostic/therapeutic management of surgical patients. History taking, physical examination, communication, problem solving, and surgical techniques. Economic issues. Students work as part of a surgical service team with faculty member, resident, and intern.

**CVM 6664. Elective Small Animal Surgery.** (2 cr [max 20 cr]; S-N only. Prereq-DVM 3rd or 4th yr or #) Elective surgeries such as ovariohysterectomies, neuters, and declaws for small animals. Two-student teams are responsible for pre-surgical evaluation, anesthesia induction/maintenance, surgical procedure, and post-operative care of animals supplied by Humane Society for Companion Animals.

**CVM 6666. Special Procedures in Veterinary Radiology.** (2 cr. Prereq-DVM 3rd or 4th yr or grad or #) Contrast agents and procedures used to examine various body systems or anatomical areas.

**CVM 6668. Radiology.** (2 cr [max 4 cr]; S-N only. Prereq-DVM 3rd or 4th yr or #) Review/practice skills for interpretation of radiographs and positioning of patients. Intravenous urography, cystography, intestinal contrast studies. Emphasizes concepts of radiographic interpretation, in daily rounds. Large/small animal species.

**CVM 6682. Small Animal Theriogenology.** (2 cr [max 4 cr]; S-N only. 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.** (1 cr; A-F only. Prereq-DVM or #) Hands-on clinical experience in the evaluation of small animal reproduction. Two three-hour labs, several projects.

**CVM 6690. Integrative Medicine.** (2.5 cr; S-N only. Prereq-2nd yr DVM student or #) History/principles of acupuncture, chiropractic, and other commonly used complementary approaches to care of domestic animals. Training requirements for certification. Lectures, case examples, demonstrations. Two and a half day May session elective.

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

**CVM 6700. Advanced Track Block.** (12 cr; S-N only. Prereq-3rd yr DVM student) Preparation for senior rotations.

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

**CVM 6704. Reproductive Diseases of Food Animals.** (2 cr [max 6 cr]; A-F only. Prereq-3rd yr DVM or #) Common diseases affecting reproductive function in cattle, swine, and small ruminants. Students may take 1-3 species. Students must at least 10 hours for 1 credit.

**CVM 6706. Epidemiology and Biostatistics.** (2 cr [max 8 cr]; S-N only. Prereq-DVM 4th yr or grad student or #) How to formulate questions, analyze problems, and develop solutions relating to food animal production systems. Excel, Access, and basic statistical programs. Design/evaluation of field trials. Epidemiology. Statistical process control. Field trips to apply data/results and consult with people in field.

**CVM 6709. Advanced Building Design.** (2 cr [max 8 cr]; S-N only. Prereq-DVM 4th yr or CVM grad student or #) Design of animal housing systems. Evaluation of operating production units. Natural/mechanical ventilation systems. Ventilation and building placement. Classroom presentations, on-farm evaluations.

**CVM 6711. Large Animal Medicine.** (2 cr [max 8 cr]; S-N only. Prereq-DVM 3rd or 4th yr or #) Medical diseases of horses, cattle, small ruminants, South American camelids, and pot bellied 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 6714. Large Animal Surgery.** (2 cr [max 40 cr]; S-N only. Prereq—DVM 3rd or 4th yr 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 6716. Large Animal Anesthesia.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Anesthesiologists and students work as a team to determine proper anesthetic management and monitoring of events during general anesthesia. Local-anesthetic techniques. Problem solving in formulation of anesthetic plans. Management of patients under anesthesia. Emphasizes team work and pain management.

**CVM 6717. Large Animal Diagnostic Ultrasonography.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr) Fundamentals of diagnostic ultrasound in large animal patient. Ultrasonography of equine limbs, joints, abdomen, and thorax. Ultrasound of cases within hospital as available. Dissection of equine limbs required. Students present topic of choice in large animal ultrasound and participate in general emergency duty for large animal hospital.

**CVM 6718. Large Animal Community Based Practice Mentoring.** (1 cr; S-N only. Prereq—2nd yr DVM or #) Large animal veterinary practice. Opportunity to practice new clinical skills with a veterinarian who may serve as a mentor. Students visit the practice four times.

**CVM 6720. Problem Solving in Equine Medicine.** (1 cr; A-F only. Prereq—DVM 1st or 2nd or 3rd yr or #) Diagnosis of a case. Students are given a clinical sign or laboratory finding each week. Generation of differential diagnosis list, diagnostic plan.

**CVM 6721. Neonatology.** (1-2 cr; S-N only) Instruction, emergency duty, and practical application of principles in evaluating and treating sick equine neonates. Seasonal participation in clinically managing hospitalized foals and periodically reviewing past cases.

**CVM 6722. Clinical Anatomy of the Equine Limb.** (1-2 cr; S-N only. Prereq—#; limited registr—1st yr DVM students have priority) Practical limb anatomy. Clinical cases, common surgical procedures. Special diagnostic techniques such as radiology, nerve blocks, joint injections, and ultrasound.

**CVM 6723. Colic Management.** (1 cr; S-N only. Prereq—DVM 1st yr) Principles and techniques for evaluating and treating equine colic cases.

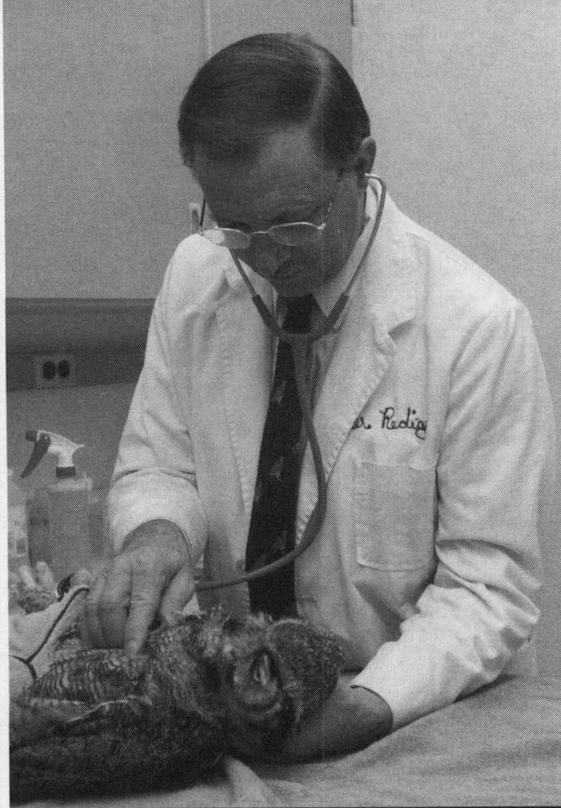
**CVM 6724. Equine Colic Team.** (1 cr; S-N only. Prereq—6723, DVM) Clinically managing equine colic cases and periodically reviewing past cases, success rates, and topics in related fields.

**CVM 6725. Advanced Colic Team.** (1 cr [max 2 cr]; S-N only. Prereq—6724, DVM or #) Clinically managing cases and periodically reviewing past cases, success rates, and topics in related fields. Students act as team leaders during clinical management and assist in lab exercises for 6723.

**CVM 6727. Equine Palpation.** (1 cr; A-F only. Prereq—DVM or #) Hands-on clinical experience in evaluation of equine reproductive status and reproductive disorders.

**CVM 6728. Reproductive Diseases of the Horse.** (1 cr; A-F only. Prereq—3rd yr DVM or #) Reproduction patterns, breeding practices, management, artificial insemination, economics of reproductive performance, and infertility in horses.

**CVM 6730. Advanced Equine Practice Elective.** (2 cr; S-N only. Prereq—3rd or 4th yr DVM or #) Intensive course on equine medicine. Theriogenology content/skills beyond core.



**CVM 6731. 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 6732. Equine Dentistry.** (2 cr [max 2 cr]; S-N only. Prereq—3rd or 4th yr DVM or #) Small group lectures, demonstrations, labs. Hands-on dentistry on client-owned animals.

**CVM 6734. Equine Surgery.** (2 cr [max 16 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Basic surgical principles relating to horses. History taking, diagnostics. Development of therapeutic plan from surgical standpoint.

**CVM 6736. Equine Lameness.** (2 cr [max 16 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Lameness in horses. Clinical cases. Hands-on diagnosis/treatment. Videos, radiographic/other imaging tool exams, Discussions involving diagnosis/treatment. Attend to hospitalized cases before morning rounds.

**CVM 6738. Equine Podiatry.** (2 cr; S-N only. Prereq—DVM 3rd or 4th yr or #) Concepts of equine podiatry. Anatomy and physiology of foot and hoof. Labs to provide experience supporting lessons learned in lectures. Disease seminars and discussion of actual cases. Labs introducing basic techniques and methods of treatment for injuries.

**CVM 6747. Equine Theriogenology Introduction.** (2 cr [max 16 cr]; S-N only. 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 6748. Equine Theriogenology Advanced.** (2 cr [max 8 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Students are in charge of breeding management decisions: select mares from teaching herd, use palpation and ultrasound/pharmacologic aids to ensure timely breeding to frozen semen, which was frozen/assessed by students. Students participate in equine theriogenology cases admitted to Veterinary Medical Center.

**CVM 6750. Equine Sports and Preventive Medicine.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Equine industry, sports-performance activities, role of veterinarian. Thoroughbred racing. Show-horse, English, and Western pleasure-horse activities. Training, physiologic adaptations, diseases, rehabilitation, regulations on drug use, development/institution of preventative-medicine programs. Treadmill evaluation of gait, hoof balance, upper airway function. Imaging techniques. Field trips, guest lectures.

**CVM 6790. Advanced Small Ruminant Practice.** (1 cr; A-F only. Prereq—DVM 3rd or 4th yr) Training beyond core in practice of small ruminants. Lecture.

**CVM 6791. Advanced Small Ruminant Practice: Laboratory Block.** (1 cr [max 4 cr]; S-N only. Prereq—3rd yr or 4th yr DVM or #) Common diagnostic/therapeutic procedures used in treating small ruminants.

**CVM 6792. Small Ruminant Health and Production Rotation.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Sheep, goat, llama, farmed-deer production, medicine, and health. Nutrition/health management, new stock, facility maintenance, husbandry, diagnosis, record keeping, zoonosis, necropsy. Reproductive management. Breeding soundness, body condition, vasectomy, ultrasound, castration, tail docking, disbudding, dehorning, vaccination, parasites, restraint/handling, venipuncture, foot trimming, tuberculin testing. Farm visits.

**CVM 6793. Small Ruminant Reproduction.** (.5 cr; A-F only. Prereq—3rd yr DVM or #) Breeding soundness of males, embryo transfer, artificial insemination semen, cryopreservation. Reproductive management of goat/sheep herds. Sire/dam selection, genetic potential, nutritional affects. Reproductive tracts. Estrus detection, breeding patterns, reproductive pharmacology. Vaginal examination, biopsy/cytology, reproductive microbiology. Camelid progesterone case studies. Captive breeding programs for wild hoof stock.

**CVM 6795. Herd Health.** (2 cr; S-N only. 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. Five day, Intersession course.

**CVM 6796. Advanced Feedlot Herd Health.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr student or #) Beef cattle feedlot production, medicine, health management. Production systems. Receiving protocols, economics. Livestock selection/evaluation, health management, facility evaluation. Pre-conditioning, pre-immunization, environmental pollution monitoring, transportation/vaccine protocols, nutrition, respiratory diseases, epidemics/disease. Evaluation of small/large feedlot operations. Body condition scoring, castration, dehorning/parasite control. Necropsy, field pathology sampling.

**CVM 6797. Cow-Calf Herd Health and Production.** (2 cr [max 4 cr]; S-N only. 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, zoonosis. 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; A-F only. Prereq—DVM or #) Practice in diagnostic evaluation of bovine reproductive tract.

**CVM 6801. Advanced Dairy Production Medicine.** (1 cr; S-N only. 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 6802. Advanced Large Ruminant Clinical Elective.** (3 cr; S-N only. Prereq—DVM 3rd or 4th yr or #) Topics in cattle health/production medicine not included in core. More extensive discussion of conditions introduced in core.

**CVM 6803. Advanced Bovine Practice: Laboratory Block.** (2 cr; S-N only. Prereq—[6802, [DVM 3rd or 4th yr]] or #) Cattle health, production medicine. Topics not included in core, more extensive discussion of conditions introduced in core.

**CVM 6804. Bovine Surgery.** (2 cr; S-N only. Prereq—DVM 3rd or 4th yr or #) Technical/theoretical skills in management of individual cow surgical diseases. Emphasizes abdominal/urogenital surgery of dairy cow. Discussion, labs. Students research topics and prepare for surgery.

**CVM 6805. Food Animal and Exotic Animal Anesthesia.** (.5 cr; S-N only. Prereq—5321 or equiv) Techniques/complications of sedation, local anesthesia, and general anesthesia in ruminants, pigs, and some large exotic species. Cases demonstrate anesthetic management of clinical problems common in veterinary practice.

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*“The best thing about this program is that it is within the College of Veterinary Medicine. Graduate students have the opportunity to design their programs in such a way as to take advantage of the countless opportunities available here.”*

*Eran, B.Sc.Agr., M.S., VMed Graduate Student  
Israel*

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**CVM 6811. Dairy Theriogenology Palpation.** (2 cr [max 20 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Palpating the reproductive tract of the cow per rectum. On-farm reproductive record systems. Evaluating dairy herd reproductive performance through DHI reports. Dairy Comp 305 and DairyCHAMP reports. Farm visits, case discussions, laboratories, student presentations.

**CVM 6812. Dairy Theriogenology Management.** (2 cr [max 8 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Two-week rotation of lecture/laboratory. Embryo transfer. Breeding soundness evaluation of bulls. Health management of bulls. Obstetrics and fetotomy. Reproductive management of dairy herd. Decision cases on herds with infertility problems. Approaches to sire selection, evaluating genetic and nutrition factors on reproduction.

**CVM 6813. Farm Animal Reproduction and Delivery Management.** (2 cr [max 4 cr]; S-N only. Prereq—3rd or 4th yr DVM or #) Two week rotation associated with MVMA's reproduction booth (Birthing Center) at Minnesota State Fair. Students participate in delivery of calves, lambs, and piglets, and assist in public education about processes related to large animal delivery and veterinary care.

**CVM 6814. Mastitis, Milking Machines, and Milk Quality.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Provide tools to evaluate herd mastitis problems, recommendations for solutions, develop mastitis controls programs, evaluate adequacy of milking system function, field surgery of mammary gland and teats, provide therapy for clinical mastitis. Milking equipment, microbiology, mastitis, pharmacology, residue avoidance, records analysis, stray voltage testing, surgery, mastitis control techniques. Decision case studies, labs, and farm visits.

**CVM 6815. Dairy Ruminant Nutrition.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Basic principles of nutritional management of ruminant, including digestive physiology, nutrient requirements, common feed stuffs, forage management, processing and storage systems, laboratory analysis of nutrient composition of feed stuffs, feeding management systems, and nutrition-related health disorders. Develop skills using different techniques (e.g. spreadsheet analysis, Spartan ration balancing software program, DairyComp 305 production and health records) to evaluate nutritional management programs. On-farm investigations include assessment of forage quality, feeding management, environment, facilities, cow comfort, dry matter intakes, ration effective fiber, ration moisture content, urine pHs, body condition scoring, and production records review. Discussion of unique aspects of nutritional management of beef cattle and small ruminants. Highly recommended for students interested in dairy or beef practice. Prerequisite for students considering later enrolling in Applied Dairy Nutrition.

**CVM 6816. Applied Dairy Nutrition.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Practical experience in analysis, formulation, and troubleshooting of rations for dairy cows. Determining quantity/quality of feeds. How cows move through dairy at different stages of production and in dry period. Students work with computerized ration programs. Feeding-management issues, monitoring cattle production, cow comfort, and housing issues. Forage preservation/management.

**CVM 6820. Dairy Record Analysis, Epidemiology, and Economics.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Evaluation of a dairy herd using biological and economic records. Records analysis. Economic basis of dairying. Financial techniques for evaluating producer decisions and veterinary recommendations. Field trips, decision-case evaluation, laboratories.

**CVM 6821. Transition Dairy Cow Management and Clinical Care.** (2 cr [max 12 cr]; S-N only. Prereq—3rd or 4th yr DVM student or #) Students assist in all aspects of routine day-to-day management of facility, write detailed report on practical delivery of standard therapeutic or management protocol. Students live in facility during most of rotation. Care of newborn calf, calving cow, later (first two weeks fresh) post-partum cow. Research projects, housekeeping, miscellaneous tasks.

**CVM 6830. Youngstock and Dairy Production Medicine.** (2 cr [max 6 cr]; S-N only. Prereq—[6815, 6818, DVM yr 4] or #) Heifer management program. Mastitis prevention, reproductive management, housing, nutrition, infectious disease control, biosecurity, parasite control, genetics, economics, business structure. Students evaluate heifer management on client dairies, help develop a heifer-rearing program. Reproductive, udder health, production, and disease records. Record management software.

**CVM 6840. Swine Core.** (2 cr. Prereq—DVM or #) Swine medicine, production, and health management.

**CVM 6841. Swine Behavior.** (.5 cr. Prereq—[3rd or 4th yr] DVM or #) Common considerations in swine behavior.

**CVM 6842. Swine Disease Diagnostics, Therapeutics, and Prevention.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Major diseases and high-health technologies. Field trips of high-/low-health farms, abattoir for slaughter check. Problem solving, discussion of on-farm disease cases. In-clinic diagnostic techniques.

**CVM 6843. Understanding PRRS: A Problem-Based Approach.** (3 cr; A-F only. Prereq—3rd or 4th yr DVM or grad student or practitioner) Students experience real-time cases of Porcine Reproduction and Respiratory Syndrome (PRRS) and devise diagnostic plans/intervention strategies, receiving actual diagnostic/production data to monitor progress. Course is all on-line.

**CVM 6844. Swine Production Systems.** (2 cr [max 4 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Alternative systems of swine production. Didactic lectures, labs, special projects. Information management systems, building and equipment designs, health, genetics nutritional systems, marketing alternatives. Influence of production systems on biological and financial endpoints. Upon completion, present project completed on design of various components of integrated swine production system.

**CVM 6845. Swine Production Training.** (2 cr [max 8 cr]; S-N only. Prereq—3rd or 4th yr DVM or #) Day-to-day management of modern swine farm. Students assist with all techniques, protocols, and practices encountered daily in swine unit, conduct any necessary necropsies or surgical techniques, investigate production/health problems. On final day of rotation, students lead herd visit, summarize findings with producer and course coordinator, and write a herd report.

**CVM 6846. Swine Nutrition.** (2 cr [max 8 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Nutrition and feeding management of pigs. Nutrient requirements. Feeds, feed delivery, and feeding management. Computer laboratories. Farm visits.

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*“The Vet Med Program has provided a great opportunity to deepen my understanding of veterinary sciences and the mechanisms of animal diseases. Additionally, it has strengthened the association of my clinical knowledge in the basic sciences.”*

*Geisa, DVM, VMed Graduate Student  
Brazil*

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**CVM 6818. BioSecurity: Dairy Disease and Treatment Protocols.** (2 cr; S-N only. Prereq—DVM 3rd or 4th yr or #) Students assist a dairy producer with implementing management to control/treat common dairy diseases, designing herd health programs, defining “biosecurity.” Disease testing, vaccination programs. Pharmaceutical products routinely used, issues surrounding judicious pharmaceutical use in food producing animals. Roles/responsibilities of food animal practitioners to ensure food safety.

**CVM 6848. Swine Economics, Financial Management, and Marketing.** (2 cr [max 8 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Basic accounting and financial skills to help analyze simple agricultural problems and communicate findings. Financial statement, budgeting, partial and capital budgets, time value of money, methods for assessing return on investment. Most of examples from pork production, but other scenarios welcome. Second emphasis on gaining understanding on becoming personally financially independent.

**CVM 6850. Swine Records.** (2 cr [max 8 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) How to interpret performance measures, monitor productivity, capture data, and generate reports in managing production in swine industry. Using records to troubleshoot problems and manage production.

**CVM 6852. Swine Virology.** (2 cr [max 8 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Lab techniques for diagnostic virology, serology, and immunology. Research techniques for use of fluorescent antibodies, determination of classes of immunoglobulins, and immunostimulation of lymphocytes.

**CVM 6880. Avian Core.** (2-4 cr; A-F only. Prereq—DVM or #) Avian nutrition, physiology, anatomy, and disease.

**CVM 6882. Companion Birds.** (2 cr; S-N only. Prereq—DVM 3rd or 4th yr or #) Avian medicine/surgery relating to companion birds. Hands-on experience in local aviaries and breeding facilities. Acquisition of basic avian clinical skills in the Raptor Center.

**CVM 6883. Raptor Center.** (2 cr; S-N only. Prereq—6497, DVM 3rd or 4th yr, #) Students participate in all aspects of raptor medicine, surgery, and rehabilitation and gain avian experience. Conservation medicine.

**CVM 6884. Biosecurity in the Poultry Industries.** (2 cr [max 16 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Broiler, layer, and turkey industries, performance analysis, disease diagnosis, management techniques for prevention/control of disease and food safety problems. Emphasizes disease prevention and food safety. Classroom presentations, discussions, on-farm evaluations.

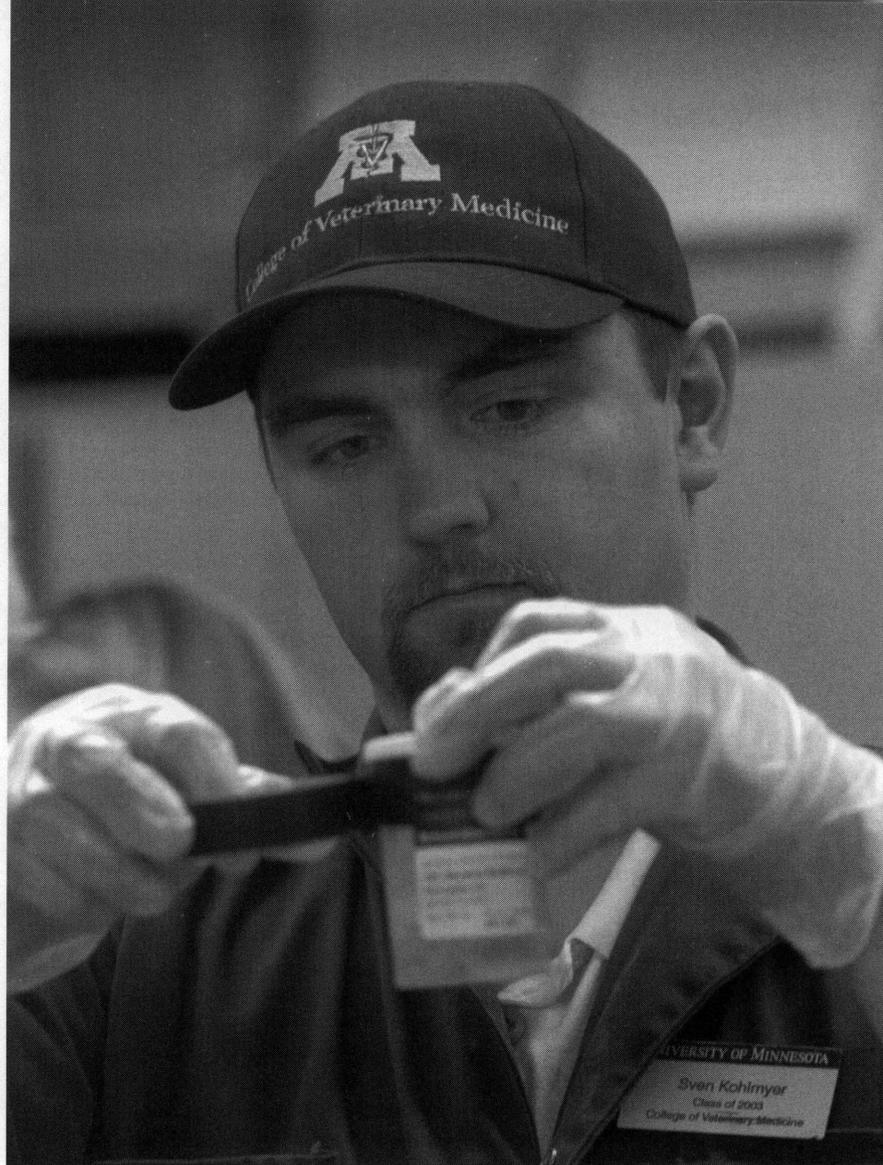
**CVM 6930. Medical Management of Zoo Animals.** (1 cr; S-N only. Prereq—3rd yr DVM or #) Zoo animal handling techniques, including physical/chemical restraint, commonly seen diseases, preventative medicine programs. Adaptation to standard medical practice/management techniques for zoos. Lectures.

**CVM 6931. Diseases of Zoo Animals and Exotic Pets.** (1 cr; S-N only. Prereq—DVM or grad or #) Diseases of and management procedures for zoo animals and exotic pets. Restraint procedures, medication, diagnosis.

**CVM 6932. Advanced Zoo Animal Medicine.** (1 cr; S-N only. Prereq—[6931, [DVM 3rd or 4th yr]] or #) Adapting existing veterinary techniques/principles to zoo animal medicine. Animal management and preventive medicine programs.

**CVM 6933. Zoological Medicine.** (2 cr [max 20 cr]; S-N only. Prereq—DVM 3rd or 4th yr or #) Introduction to all aspects of health care of zoo animals. Housing, nutrition, preventative health programs. Students assist zoo veterinarians with immobilizations, examinations, necropsies, laboratory work, records keeping.

**CVM 6934. Selected Topics in Zoo Animal Medicine.** (5 cr [max 10 cr]; A-F only. Prereq—DVM 1st or 2nd yr or #) Year-long 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/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.



**CVM 6940. Cytogenetic Evaluation of Animal Diseases.** (1 cr. Prereq—[DVM, grad student] or #) Cytogenetics in animal disease diagnosis. Lab preparation/analysis of chromosomes. Preparing prophase spreads of chromosomes, staining and photographing, and preparing karyograms for analysis.

**CVM 6950. Introduction to Aquaculture Medicine.** (.5 cr [max 1 cr]; S-N only. Prereq—DVM or #) General introduction to aquatic medicine. Epidemiology of bacterial, viral, fungal, and parasitic diseases in farmed fish. Emphasizes farmed fish husbandry practices.

## Clinical and Population Sciences (CAPS)

**CAPS 3502. Animal Health and Disease.** (3 cr; A-F only. Prereq—Biol 1009) Common diseases that affect farm animals (especially dairy cattle, swine). Host-agent-environment interactions that cause disease (microbiology, immunology, environmental factors). Incorporating preventive management practices in animal production systems, monitoring health/productivity, recognizing disease. Treatment considerations. Major exotic/zoonotic diseases. In-house labs or field trips.

## Molecular Veterinary Bioscience (MVB)

**MVB 5200. Statistical Genetics and Genomics.** (4 cr; A-F only) Statistical issues in genomics. Gene detection, including statistical analysis/designs for linkage study and for mapping quantitative trait loci. Linkage analysis using pedigree data for codominant/dominant markers. Using radiation hybrid mapping/single cell typing. Design issues in linkage analysis, parentage testing, and marker polymorphism.

**MVB 5594. Directed Research in Molecular Veterinary Biosciences.** (1-4 cr [max 4 cr]; A-F only. Prereq-Jr) Special project, addressing specific issue in veterinary medicine, under guidance of faculty member.

**MVB 8100. Research Rotation in Molecular Veterinary Biosciences.** (4 cr [max 8 cr]; A-F only. Prereq-1st yr MVB grad student) Directed research laboratory rotations. Experimentation, supplemental reading, research presentations under guidance of faculty member who is potential thesis adviser. Taught by program faculty.

**MVB 8134. Ethical Conduct of Animal Research.** (2 cr; A-F only. Prereq-[Grad or professional school] student or #) Ethical considerations in the use of animal subjects in agricultural, veterinary, and biomedical research. Federal, state, and University guidelines relating to proper conduct for acquisition/use of animals for laboratory, observational, epidemiological, and clinical research. Regulatory requirements. Bases for proper conduct. Societal impact on scientific investigations utilizing animal subjects.

**MVB 8201. Mechanisms of Animal Health and Disease I.** (3 cr; A-F only. Prereq-1st yr MVB grad student or approval of crse coordinator) Basic mechanisms of animal health. Innate/acquired immunity. Immune avoidance. Cellular basis for pathogenesis of animal diseases. Molecular/genetic mechanisms of host resistance. Host/pathogen interactions.

**MVB 8202. Mechanisms of Animal Health and Disease II.** (3 cr. Prereq-8201) Multi-perspective approach to critically evaluating journal articles, as done for peer-reviewed journals. Aspects of host/pathogen interactions, including molecular/genetic mechanisms of host resistance and pathogenesis.

**MVB 8333. FTE: Master's.** (1 cr; NGA. Prereq-Master's student, adviser and DGS consent)

**MVB 8335. Molecular Biology Techniques.** (3 cr. Prereq-Biol 5001, Biol 5003 or equiv or #) Basic theory and current methodologies of molecular biology and recombinant DNA technology. Lab work includes DNA and RNA hybridization, gene transfer, and polymerase chain reaction techniques. Primarily for students with limited exposure to molecular biology.

**MVB 8351. Drug-Receptor Interactions.** (2 cr; A-F only. Prereq-[Chem 1011-1012 or equiv, CVM 6055 or equiv, calculus through differential equations] or #) Dynamics of interaction between drugs and their receptors. Historical development of drug-receptor theory, factors affecting drug concentration in receptor compartment, determination of agonist and antagonist activity, pharmacodynamics of recombinant receptors, and functional receptor classification.

**MVB 8361. Neuro-Immune Interactions.** (3 cr. Prereq-[MicB 5218 or equiv], [NSc 5561 or equiv]) Regulatory systems (neuroendocrine, cytokine, and autonomic nervous systems) linking brain and immune systems in brain-immune axis. Functional effects of bidirectional brain-immune regulation. Course is offered fall of even-numbered years.

**MVB 8371. Mucosal Immunobiology.** (3 cr; A-F only. Prereq-MiCa 8001 or equiv or #) Host immune processes at body surfaces. Innate/adaptive immunity at mucosal surfaces. Interactions/responses of various mucosal tissues to pathogens. Approaches to target protective vaccination to mucosal tissues. Lectures, journal.

**MVB 8394. Research in Comparative Biomedical Sciences.** (1-6 cr [max 18 cr]. Prereq-Grad MVB major) Directed research determined by student's interests, in consultation with faculty mentor.

**MVB 8444. FTE: Doctoral.** (1 cr; NGA. Prereq-Doctoral student, adviser and DGS consent)

**MVB 8494. Research in Molecular Mechanisms of Disease.** (1-6 cr [max 18 cr]. Prereq-Grad MVB major) Directed research determined by student's interests, in consultation with faculty mentor.

**MVB 8550. Molecular Veterinary Biosciences Seminar.** (1 cr [max 8 cr]; S-N only. Prereq-Biol sciences grad student) Student and faculty presentations of their own research or a directed topic.

**MVB 8560. Research and Literature Reports.** (1 cr [max 8 cr]; S-N only. Prereq-Grad MVB major or #) Current developments in cellular and molecular mechanisms of animal health and disease.

**MVB 8570. Comparative Biomedical Sciences Seminar.** (1 cr [max 8 cr]; S-N only. Prereq-Biol sciences grad student) Weekly seminar by primarily outside speakers discussing current issues.

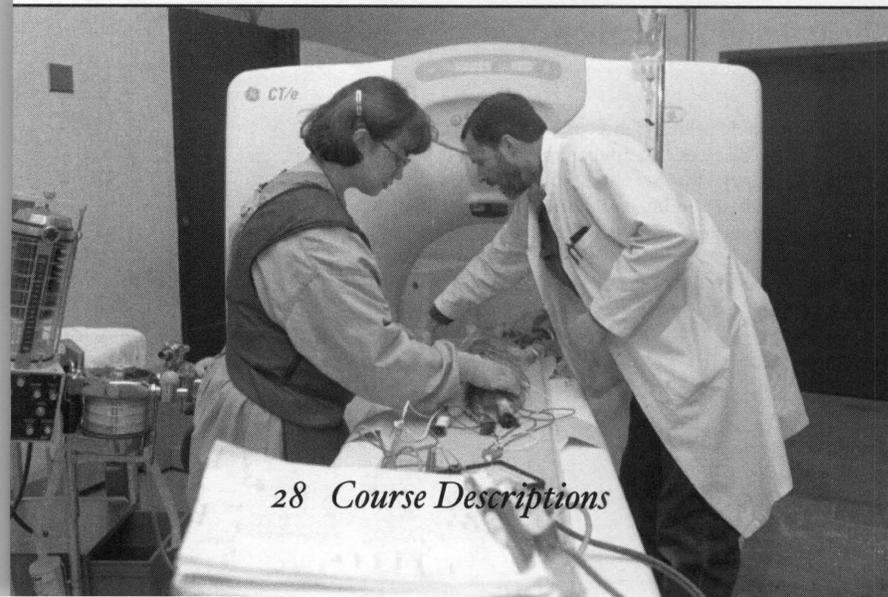
**MVB 8666. Doctoral Pre-Thesis Credits.** (1-18 cr [max 60 cr]; NGA. Prereq-Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**MVB 8777. Thesis Credits: Master's.** (1-18 cr [max 50 cr]; NGA. Prereq-Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**MVB 8888. Thesis Credits: Doctoral.** (1-24 cr [max 100 cr]; NGA. Prereq-Max 18 cr per semester or summer; 24 cr required)

## Small Animal Clinical Sciences (SACS)

**SACS 3050. Perspectives: Interrelationships of People and Animals in Society.** (2 cr) Interrelationships of people/animals. Social, economic, health consequences. Pets/people sharing urban environment, animal rights, influence of cultural differences on animal-human relationships.



## Veterinary Diagnostic Medicine (VDM)

**VDM 5532. Hematology, Cytology, and Microbiology Labs.** (2-4 cr [max 40 cr]; S-N only. Prereq—Grad student or #) Two-week intensive rotation in veterinary clinical laboratory medicine. Cytology (masses, body fluids, lymph nodes), hematology, clinical chemistry, urinalysis, clinical microbiology, endocrinology, virology, parasitology, immunology. Sample submission, laboratory test methodology. Case-based learning, small group discussion, didactic teaching, microscopy.

## Veterinary Medicine, Graduate (VMed)

**VMed 5080. Problems in Veterinary Epidemiology and Public Health.** (1-3 cr; A-F only. Prereq—#) Individual study on problem of interest to epidemiology or public health student.

**VMed 5090. Seminar: Veterinary Epidemiology.** (1 cr [max 3 cr]; S-N only. Prereq—Veterinary Medicine grad student) Each student leads at least one seminar. Reviews of current research, literature reviews, and technique development. Students and participating faculty participate in presentation, discussion, and administration of the seminars.

**VMed 5093. Directed Studies in Population Medicine.** (1-4 cr [max 8 cr]; A-F only. Prereq—Grad student, #) Directed studies arranged between student and instructor.

**VMed 5165. Monitoring and Surveillance of Disease and Production.** (2 cr; A-F only. Prereq—#) Seminars/discussion on techniques to monitor animal disease/production. Distance course format.

**VMed 5193. Dairy Decision Making in a Financial Context.** (2 cr; A-F only. Prereq—Earned DVM, #) Economic/decision making principles applied to commercial dairy farms in North America. Economic techniques, decision making under financially constrained conditions. Financial evaluation of a dairy operation. Modules assignments, written work submitted via the Internet, discussions at online course site.

**VMed 5210. Advanced Large Animal Physiology I.** (1-3 cr [max 6 cr]) Review of large animal physiology at level needed for specialty board certification or beginning research. Students present topics in physiology and supplement reading with clinical case material or journal articles.

**VMed 5211. Advanced Large Animal Physiology II.** (1-3 cr [max 6 cr]; A-F only. Prereq—5210 recommended) Review of large animal physiology at level needed for specialty board certification or beginning research. Students present topics in physiology and supplement reading with clinical case material or journal articles.

**VMed 5212. Large Animal Diagnostic Ultrasonography.** (1 cr; A-F only. Prereq—#) Fundamentals of diagnostic ultrasound in large animal patient. Ultrasonography of the equine limbs/joints, large animal abdomen/thorax. Lectures, lab.

**VMed 5232. Comparative Clinical Veterinary Dermatologic Pathology.** (1 cr; A-F only. Prereq—Grad student, #) Microscopic pathology of basic dermatologic reactions and of variable disease states.

**VMed 5274. Diseases of the Urinary System.** (1 cr; A-F only. Prereq—#) Expands on disorders of small animal urinary system. Introduction to core and to additional disorders.

**VMed 5291. Independent Study in Veterinary Medicine.** (2 cr. Prereq—DVM, #) Arranged independent study in a clinical area of veterinary medicine.

**VMed 5293. Directed Studies in Comparative Medicine and Pathology.** (1-4 cr [max 8 cr]; A-F only. Prereq—Grad student, #) Directed studies arranged between student and instructor.

**VMed 5295. Problems in Large Animal Clinical Medicine/Surgery and Theriogenology.** (1 cr [max 3 cr]; A-F only. Prereq—VMed grad student, possess DVM) Hospital cases using standardized format, audiovisual aids. Review literature pertaining to case. One or two cases presented by enrolled participants per month.

**VMed 5493. Directed Studies in Infectious Disease.** (1-4 cr [max 8 cr]; A-F only. Prereq—Grad student, #) Directed studies arranged between student and instructor.

**VMed 5596. Swine Diseases and Diagnostics.** (2-3 cr) Review of recent advances in swine diseases; farm visits for on-farm disease diagnostics and control programs.

**VMed 5610. Companion Animal Oncology.** (2 cr; S-N only. Prereq—DVM, #) Principles of veterinary oncology. Biologic behaviors, treatments, and prognosis of neoplastic disorders.

**VMed 5691. Independent Research in Veterinary Anesthesiology.** (1-6 cr; A-F only. Prereq—[Biology major or prevet or vet or grad student], #) Independent research supervised by faculty member.

**VMed 5693. Directed Studies in Surgery/Radiology/Anesthesiology.** (1-4 cr [max 8 cr]; A-F only. Prereq—Grad student, #) Directed studies arranged between student and instructor.

**VMed 5720. Small Animal Orthopedic Radiology.** (2 cr. Prereq—#) Roentgen signs of common bone diseases of small animals.

**VMed 5722. Large Animal Orthopedic Radiology.** (1-2 cr. Prereq—#) Roentgen signs of common bone diseases of large animals. Emphasizes the horse.

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*“My reason for coming to Minnesota’s vet school was because my father and I thought it the hidden jewel of the Midwest.”*

*Sarah, Class of 2007  
Albany, NY*

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**VMed 5893. Directed Studies in Theriogenology.** (1-4 cr [max 8 cr]; A-F only. Prereq—Grad student, #) Directed studies arranged between student and instructor.

**VMed 7706. Advanced Epidemiology and Biostatistics.** (2 cr. Prereq—Grad or IV track) Describing data and using statistical testing techniques. Strengths and limitations of statistical methodologies.

**VMed 7709. Advanced Building Design and Environment.** (2-4 cr. Prereq—Grad or IV track) Advanced building design for animal housing. Naturally ventilated and mechanically ventilated buildings. Dairy and swine production.

**VMed 7842. Advanced Swine Diseases.** (2 cr. Prereq—Grad) Lectures and discussion on advances in diseases of swine.

**VMed 7844. Advanced Swine Production Systems.** (2 cr. Prereq—Grad or IV track) Swine production systems. Design, construction, staffing, pig flow, and financial aspects.

**VMed 7848. Advanced Swine Economics, Financial Management, and Marketing.** (2 cr; A-F only. Prereq—Grad or IV track) Economics theories, accounting practices, and marketing issues. Case studies to develop farm plans. Financial analysis techniques for farm production and expansion plans.

**VMed 7850. Advanced Swine Records.** (2 cr. Prereq—Grad or IV track) How to interpret data from computer health management program.

**VMed 8090. Epidemiology of Zoonoses and Diseases Common to Animals and Humans.** (1-4 cr; A-F only. Prereq—Epidemiology and infectious disease course or #) Major human zoonotic diseases, methods of transmission, diagnosis, control, and prevention.

**VMed 8134. Ethical Conduct of Animal Research.** (2 cr; A-F only. Prereq—[Grad or professional school] student or #) Ethical considerations in use of animal subjects in agricultural, veterinary, and biomedical research. Federal, state, and University guidelines relating to proper conduct for acquisition/use of animals for laboratory, observational, epidemiological, and clinical research. Regulatory requirements. Bases for proper conduct. Societal impact on scientific investigations utilizing animal subjects.

**VMed 8195. Pre-Harvest Food Safety and Public Health Aspects of Food Animal Production.** (1-3 cr. Prereq—#) Includes presentations and discussions on on-farm HACCP principles and prudent use of antibiotics.

**VMed 8201. Advanced Small Animal Veterinary Medicine.** (1-5 cr; A-F only. Prereq—#) Discussions of diseases of organs or systems in animals, including degenerative, psychological, anomalous, metabolic, nutritional, neoplastic, immune, inflammatory, toxic, and traumatic disorders.

**VMed 8202. Internal Medicine in Small Companion Animals.** (1-3 cr; A-F only. Prereq—#) Lectures, assigned readings, and discussions on internal medical problems of dogs and cats.

**VMed 8203. Advanced Diagnosis and Therapeutics of Animal Disease.** (1-2 cr; A-F only. Prereq—#) Detailed examination, treatment, and discussions of naturally occurring disease in patients admitted to Veterinary Teaching Hospital.

**VMed 8210. Seminar: Veterinary Medicine.** (1 cr. Prereq—#) Participation and presentations of regularly scheduled seminars about internal medicine.

**VMed 8220. Advanced Nephrology/Urology Clinics.** (1-3 cr. Prereq—#) Clinical investigation of naturally occurring urinary diseases in patients admitted to Veterinary Teaching Hospital.

**VMed 8230. Medical Conference.** (1-3 cr. Prereq—#) Participation in weekly conference about internal medical disorders.

**VMed 8250. Problems in Acid-base, Electrolyte, and Fluid Metabolism.** (2-4 cr; A-F only) Clinical problems and physiology of acid-base, electrolyte, and fluid disorders of dogs and cats.

**VMed 8293. Advanced Studies in Nephrology and Urology.** (1-3 cr; A-F only) Studies of urinary tract disease with goal of generating new knowledge.

**VMed 8294. Research Studies in Nephrology and Urology.** (1-3 cr. Prereq—#) Individual research on selected problems

**VMed 8296. Advanced Large Animal Veterinary Medicine.** (1-3 cr [max 6 cr]; A-F only. Prereq—DVM, grad vet med major, CAPS 7801, #) Discussions of diseases of organs or systems in animals in a clinical setting.

**VMed 8333. FTE: Master's.** (1 cr; NGA. Prereq—Master's student, adviser and DGS consent)

**VMed 8360. Evidence-based Medicine.** (2 cr; A-F only) Use of medicine literature in clinical problem solving.

**VMed 8393. Medical Conference.** (1-3 cr [max 6 cr]; A-F only. Prereq—#) Medical, surgical, or obstetrical cases supported by anatomic, bacteriologic, pathologic, physiologic, pharmacologic, and radiologic evaluations whenever applicable.

**VMed 8394. Research in Veterinary Medicine.** (1-3 cr. Prereq—#) Research problems relating to any aspect of internal medicine or to the various systems in animals.

**VMed 8396. Diagnostic and Therapeutic Techniques of Animal Diseases.** (1-3 cr [max 6 cr]. Prereq—CAPS 7801, DVM, grad vet med major, #) Detailed examination, discussions, and treatments of cases of animal diseases in a clinical setting.

**VMed 8444. FTE: Doctoral.** (1 cr; NGA. Prereq—Doctoral student, adviser and DGS consent)

**VMed 8492. Seminar: Infectious Diseases and Swine Medicine.** (1-2 cr) Students, faculty, and guest speakers present seminars on current research in diagnosis, control, and treatment of infectious diseases.

**VMed 8494. Research in Infectious Diseases.** (1-3 cr) Directed research.

**VMed 8495. Problems in Infectious Diseases.** (1-3 cr) In-depth discussion on specific problems for various infectious diseases of farm animals.

**VMed 8520. Advanced Immunology.** (2 cr) Lectures and case presentations.

**VMed 8530. Advanced Swine Diseases.** (2 cr) Lectures and discussion on advances.

**VMed 8592. Infectious Disease Journals: Critical Thinking.** (1 cr) Reading and critical discussion of journal articles.

**VMed 8593. Advanced Veterinary Virology and Serology.** (1-3 cr) Discussion and laboratory practice.

**VMed 8666. Doctoral Pre-Thesis Credits.** (1-18 cr [max 60 cr]; NGA. Prereq—Max 18 cr per semester or summer; doctoral student who has not passed prelim oral)

**VMed 8681. Advanced Small Animal Surgery.** (1-3 cr) Advanced techniques and procedures.

**VMed 8682. Advanced Large Animal Surgery.** (1-3 cr [max 6 cr]; A-F only. Prereq—DVM or equiv degree, #) Surgery of various systems in large animals, with preoperative and postoperative evaluation and management.

**VMed 8683. Surgery of the Gastrointestinal System.** (2-4 cr; A-F only) Advanced techniques and problems.

**VMed 8684. Surgical Physiology.** (1-3 cr) Discussions on pathophysiology of surgical diseases in dogs and cats.

**VMed 8685. Neurosurgery.** (2-3 cr; A-F only) Advanced neurosurgical diseases of small animals amenable to surgical treatment.

**VMed 8686. Thoracic and Cardiovascular Surgery.** (2-4 cr; A-F only) Advanced thoracic and cardiovascular diseases of small animals amenable to surgical treatment.

**VMed 8687. Plastic and Reconstructive Surgery.** (2-3 cr; A-F only) Advanced techniques in conditions of small animals.

**VMed 8688. New Techniques in Large Animal Surgery.** (1-6 cr [max 6 cr]; A-F only. Prereq—DVM or equiv degree, #)

**VMed 8689. Urogenital Surgery.** (2-3 cr) Advanced techniques in treatment of small animals.

**VMed 8691. Research in Large Animal Surgery.** (1-6 cr; A-F only. Prereq—DVM or equiv degree, #) Independent research projects.

**VMed 8692. Seminar: Small Animal Surgery.** (1 cr; A-F only)  
Discussions of problems and case analysis.

**VMed 8693. Seminar: Large Animal Surgery.** (1 cr [max 6 cr]; A-F only. Prereq—DVM or equiv degree, #) Discussion of current literature and surgery board preparation.

**VMed 8694. Research in Small Animal Surgery.** (1-3 cr; S-N only)

**VMed 8695. Problems in Large Animal Surgery.** (1-3 cr [max 6 cr]; A-F only. Prereq—DVM or equiv degree, #) New techniques and procedures in large animal orthopedic surgery.

**VMed 8696. Research in Critical Care/Emergency Medicine.** (1-3 cr. Prereq—DVM or equiv degree) Special problems course. Controlled study; prospective and retrospective models of evaluation are defined, critiqued, and used for experimental design and data collection to validate research methods.

**VMed 8777. Thesis Credits: Master's.** (1-18 cr [max 50 cr]; NGA. Prereq—Max 18 cr per semester or summer; 10 cr total required [Plan A only])

**VMed 8780. Advanced Avian Critical Care: Principles and Procedures.** (2 cr; A-F only. Prereq—Course each in vet pathology, physiology, pharmacology, anatomy, small animal anesthesia and critical care) Procedures and protocols for managing avian medical emergencies such as starvation, toxicities, respiratory failure, and massive trauma.

**VMed 8781. Seminar: Advanced Veterinary Anesthesiology.** (1-3 cr; A-F only. Prereq—[[CVM 6321, CVM 6322] or equiv], grad student) Active interaction around topics of advanced anesthesiology in veterinary species.

**VMed 8782. Advanced Veterinary Abdominal Imaging.** (1-3 cr) Applications and discussion of basic principles through emerging techniques.

**VMed 8783. Advanced Veterinary Thoracic Imaging.** (1-3 cr) Application and discussion of basic principles through emerging techniques.

**VMed 8784. Veterinary Therapeutic Radiology.** (2-3 cr [max 6 cr]) In-depth discussion of principles, practice, techniques, and complications.

**VMed 8785. Veterinary Nuclear Medicine.** (1-3 cr [max 6 cr]) In-depth discussion of principles, practice, techniques, and complications.

**VMed 8788. Seminar: Veterinary Critical Care/Emergency Medicine.** (1 cr; A-F only. Prereq—DVM or equiv degree) Current topics.

**VMed 8789. Research in Avian Clinical Problems and Procedures.** (1-3 cr; A-F only. Prereq—5330, 8780, 8796, DVM) Students conduct medical and surgical procedures involved in management of avian trauma and critical care patients.

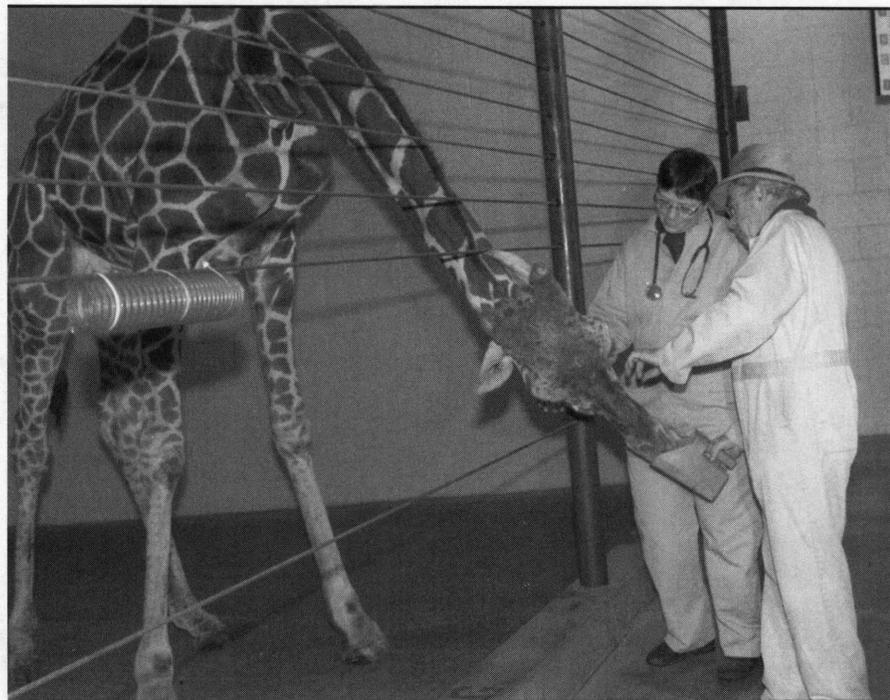
**VMed 8791. Research in Veterinary Anesthesia.** (1-3 cr; A-F only. Prereq—8781 or equiv, SACS 5380 or equiv) Research methodology; controlled prospective and retrospective research studies. Collection and analysis of scientific data.

**VMed 8792. Seminar: Veterinary Radiology.** (1 cr [max 6 cr]) Current topics in veterinary imaging, veterinary radiation therapy, or specific applications.

**VMed 8793. Seminar: Veterinary Anesthesiology.** (1-2 cr; A-F only. Prereq—CVM 6321, CVM 6322 or equiv, DVM degree) Discussion and presentations; for veterinary anesthesiology and surgery residents and graduate students.

**VMed 8794. Research in Veterinary Radiology.** (1-3 cr) Research into an application, development of an application, or prospective/retrospective study of any aspect of veterinary imaging or veterinary radiotherapy.

**VMed 8795. Problems: Veterinary Radiology.** (1-3 cr [max 6 cr]) Discussion of problems associated with veterinary imaging or radiation therapy.



**VMed 8796. Avian Anesthesia and Orthopedic Surgery.** (1-3 cr; A-F only. Prereq—Courses in vet anesthesia, vet small animal orthopedics) Current methods for anesthetizing raptors, psittacine birds, and waterfowl. Lecture and lab on current methods for avian fracture bone fixation.

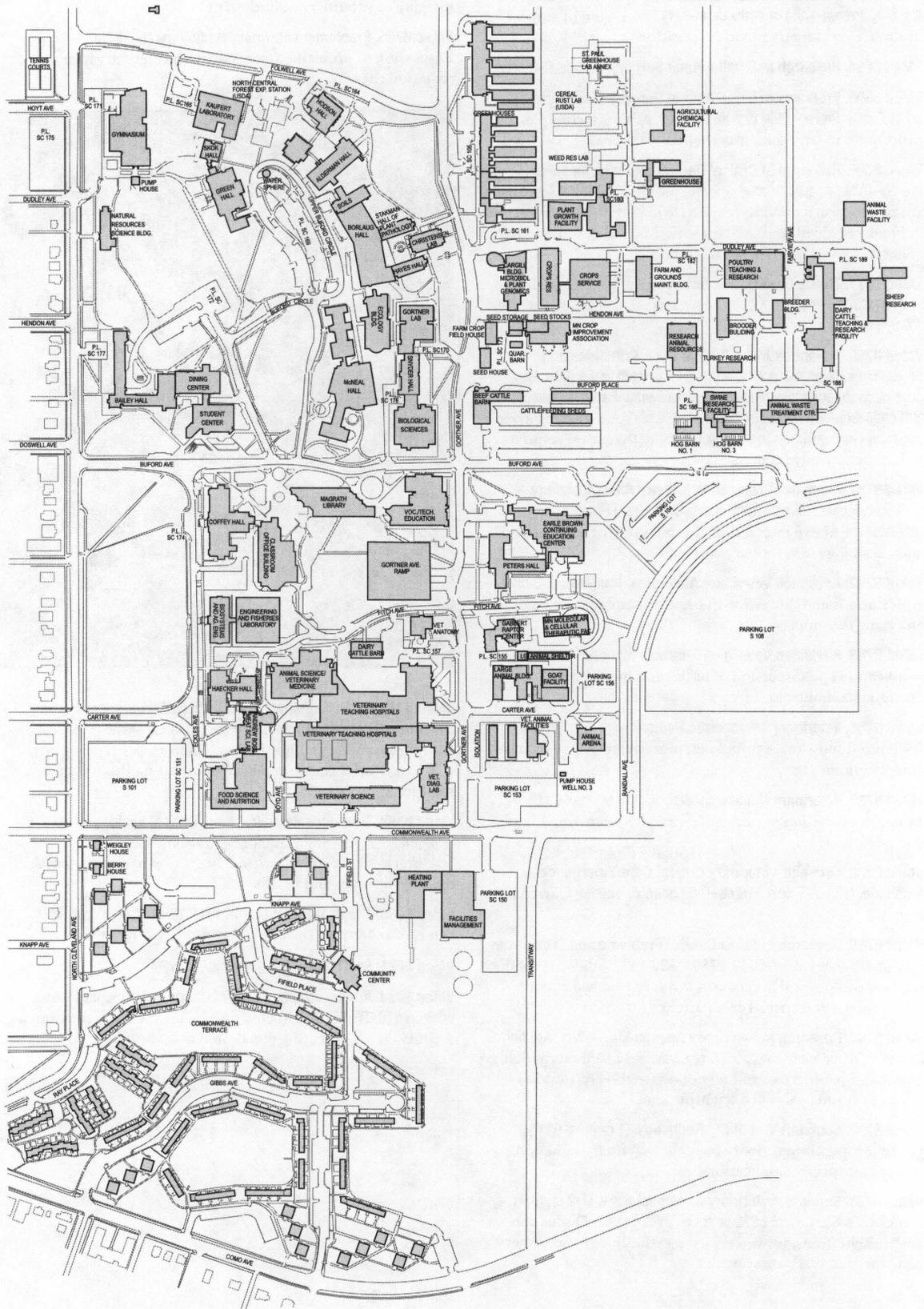
**VMed 8882. Theriogenology Journals: Critical Evaluation.** (1 cr [max 1 cr]) Reading and presentation of selected current research journal articles; critical evaluation of experimental design, methods, and results.

**VMed 8888. Thesis Credits: Doctoral.** (1-24 cr [max 100 cr]; NGA. Prereq—Max 18 cr per semester or summer; 24 cr required)

**VMed 8891. Seminar: Theriogenology.** (1 cr)

**VMed 8893. Advanced Diagnostic Methods in Theriogenology.** (1-3 cr. Prereq—CAPS 5570) Directed research in methods for studying fertility factors affecting female and male animal reproduction.

# St. Paul Campus



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Clyde Allen, Congressional District 7  
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Dallas Bohnsack, Congressional District 2  
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Lakeesha K. Ransom, At Large  
Maureen K. Reed, At Large  
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Charles Muscoplat, Vice President for Agricultural Policy  
Kathleen O'Brien, Vice President for University Services  
Mark B. Rotenberg, General Counsel

### College of Veterinary Medicine Administration

For contact information on our faculty please go to [www.cvm.umn.edu](http://www.cvm.umn.edu)

Jeffrey S. Klausner, D.V.M., M.S., dean  
Bert E. Stromberg, Ph.D., associate dean for research and graduate studies  
Laura K. Molgaard, D.V.M., associate dean for academic and student affairs  
Larry D. Bjorklund, M.S., director of student affairs and admissions  
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## College of Veterinary Medicine Faculty

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Claudia Munoz-Zanzi, D.V.M., M.P.V.M., Ph.D.

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Cynthia B. Wolf, D.V.M.

### Department of Small Animal Clinical Sciences

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Laura Ziegler, D.V.M.

**Department of Veterinary Diagnostic Medicine**

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**Department of Veterinary Pathobiology**

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Anjali Narla, Ph.D.  
Kent M. Reed, Ph.D.  
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Pamela J. Skinner, Ph.D.

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Frank Williams, M.S., Ph.D.

**Department of Animal Science  
(affiliate department of CVM)**

*Professors*

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Brian A. Crooker, Ph.D.  
William R. Dayton, Ph.D.  
Mohamed E. El Halawani, Ph.D.  
Douglas N. Foster, Ph.D.  
Leslie B. Hansen, Ph.D.  
Marcia R. Hathaway, Ph.D.  
Jerry D. Hawton, Ph.D.  
Alan G. Hunter, Ph.D.,  
Dennis D. Johnson, Ph.D.

Lee J. Johnston, Ph.D.  
James G. Linn, Ph.D.  
Sally N. Noll, Ph.D.  
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Alfredo DiCostanzo, Ph.D.  
Scott Fahrenkrug, Ph.D.  
G. Clifford Lamb, Ph.D.

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Yang Da, Ph.D.  
Marcia I. Endres, Ph.D.  
Jacqueline Jacob, Ph.D.  
Laura J. Mauro, Ph.D.  
Deborah L. Roeber, Ph.D.

## Contacts and Resources

Office of Student Finance  
University of Minnesota  
200 Fraser Hall  
106 Pleasant Street S.E.  
Minneapolis, MN 55455  
612-624-1111  
helpingu@umn.edu

Office of Academic and Student Affairs  
University of Minnesota College of Veterinary Medicine  
460 Veterinary Teaching Hospital  
1365 Gortner Avenue  
St. Paul, MN 55108  
612-624-4747  
dvminfo@umn.edu

Resident Classification and Reciprocity Office  
University of Minnesota  
130 Coffey Hall  
1420 Eckles Avenue  
St. Paul, MN 55108  
612-625-4733

or

Resident Classification and Reciprocity Office  
University of Minnesota  
240 Williamson Hall  
231 Pillsbury Drive S.E. Minneapolis, MN 55455  
612-625-6330

Office of the Registrar  
University of Minnesota  
130 Coffey Hall  
1420 Eckles Avenue  
St. Paul, MN 55108  
612-624-1111  
helpingu@umn.edu

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460 VetTchHos  
1365 Gortner Avenue  
St. Paul, MN 55108-6188  
612-624-4747

College of Agricultural, Food  
and Environmental Sciences  
University of Minnesota  
190 Coffey Hall  
1420 Eckles Avenue  
St. Paul, MN 55108-6074  
612-624-3045  
www.coafes.umn.edu

Veterinary Medical College Application Service  
(VMCAS)  
1101 Vermont Avenue N.W.  
Suite 701  
Washington, D.C. 20005-3521  
www.vmcas.org

Disability Services  
230 McNamara Alumni Center  
200 Oak Street S.E.  
Minneapolis, MN 55455  
612-624-4037 (V/TTY)  
www.disserv.stu.umn.edu

Health Careers Center  
2-565 Moos Tower  
420 Delaware Street S.E.  
Minneapolis, MN 55455  
612-624-6767  
www.healthcareers.umn.edu

Center for Health and Interdisciplinary Program  
(CHIP)  
1425 Moos Tower  
515 Delaware Street S.E.  
Minneapolis, MN 55455  
612-625-7100  
www.chip.umn.edu

## World Wide Web Directory

University of Minnesota College of Veterinary Medicine  
[www.cvm.umn.edu](http://www.cvm.umn.edu)

University of Minnesota [www.umn.edu](http://www.umn.edu)

Veterinary Medical College Application Service  
(VMCAS) and the current Veterinary College  
Application <http://aavmc.org/vmcas/vmcas2>

Planning Guide  
For Admission to the  
Doctor of Veterinary Medicine Program

2003-2004



**College of Veterinary Medicine**

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UNIVERSITY OF MINNESOTA

**Introduction** The Doctor of Veterinary Medicine degree (D.V.M.) is a rigorous four-year professional program preceded by three to four years of pre-professional study. During the first three years of the D.V.M. program, students focus on the study of the normal animal, the pathogenesis of diseases and the prevention, alleviation and clinical therapy of diseases. The D.V.M. program concludes with fourteen months of clinical rotations in the Veterinary Teaching Hospital during which time students learn methods of veterinary care and develop skills needed for professional practice. The fourth year includes ten weeks of externship experiences at off-campus sites of the student's choice. Critical to the selection of a career in Veterinary Medicine is the individual's love, concern and compassion for animals.

**High School Preparation** High school students considering a career in veterinary medicine should pursue a strong background in high school science courses, especially in biology and chemistry. A foundation in mathematics and physics is also helpful as students enter their pre-professional studies in college. High school students are also encouraged to become familiar with the veterinary profession by seeking experiences with practicing veterinarians and broadening their experiences with a variety of animal species. These experiences might include volunteering at a veterinary clinic or animal shelter.

**Pre-Veterinary Studies** Pre-veterinary studies include required courses in chemistry, biology, physics, math, English composition and liberal education. Please see the listing of specific requirements enclosed. Students may pursue their pre-veterinary studies at any accredited college or university and pursue any undergraduate major. Many community and junior colleges offer the majority of courses required with the possible exception of some of the more advanced science courses such as genetics and biochemistry. Although a Bachelor's degree is not required for admission to the D.V.M. program, approximately 70% of the students entering the program each year have completed their Bachelor's degree. The most common majors of students entering the D.V.M. program are biology and agriculture but include a variety of majors including engineering, business administration, history and music to name a few.

**Pre-Veterinary Studies at the University of Minnesota** The four primary college units at the University of Minnesota that serve as pre-veterinary programs include the College of Agricultural, Food and Environmental Sciences, the College of Liberal Arts, the College of Natural Resources and the College of Biological Sciences. Students who are planning to take only a limited number of courses at the University of Minnesota to complete their

requirements may also enroll in the College of Continuing Education (evening classes). Below are the phone numbers for these offices:

Undergraduate Admissions 612-625-2008  
240 Williamson Hall, Minneapolis Campus  
Web: <http://admissions.tc.umn.edu>  
College of Agricultural, 612-624-3045  
Food and Environmental Sciences  
190 Coffey Hall, St. Paul Campus  
Web: <http://www.coafes.umn.edu>  
College of Biological Sciences 612-624-9717  
223 Snyder Hall, St. Paul Campus  
Web: <http://biosci.cbs.umn.edu>  
College of Liberal Arts 612-624-6044  
B-18 Johnston Hall Minneapolis Campus  
Web: <http://www.cla.umn.edu/class/natsci/>  
College of Natural Resources 612-624-6768  
235 Nat. Resources Adm., St. Paul Campus  
Web: <http://www.cnr.umn.edu>  
College of Continuing Education  
Information 612-624-4000  
Catalog Request 612-624-2388  
101 Wesbrook, Minneapolis Campus  
Web: <http://www.cce.umn.edu>

**Campus Visits** A special information seminar and tour are held the **2nd and 4th Monday of every month** beginning at **1:30 p.m.** These sessions are intended for any prospective student, including high school students, thinking about a career in Veterinary Medicine. Please call **612-624-4747** to confirm the date and reserve a space at the seminar. Information sessions are held in the Student Affairs Office, Room 460 of the Veterinary Teaching Hospital on the St. Paul campus of the University. Individual appointments can also be arranged.

**Open House** Another excellent opportunity to learn about careers in Veterinary Medicine is during the annual Open House. The Open House is sponsored by the Student Chapter of the American Veterinary Medical Association and will be held on **Sunday, April 4, 2004** from 11:00 a.m. to 5:00 p.m. The Open House includes a variety of exhibits, demonstrations and seminars for people of all ages. Everyone is welcome and no reservation is needed.

**Who May Apply for Admission to the D.V.M. Program?** Residents of all states are considered for admission. Priority for admission is given to residents of Minnesota, South Dakota, North Dakota and Manitoba, Canada. Residency for admission purposes is determined by the Office of the Registrar-St. Paul & must be established by the application deadline for admission, October 1. Applicants must have lived in Minnesota one calendar year prior to the application deadline (as a non-student) to be eligible to submit an application for residency status.

## Required Pre-Veterinary Courses

University of Minnesota

<u>Course</u>	<u>Quarter Credits</u>	<u>Semester Credits</u>	<u>Requirements</u>
ENGLISH	8-12	6-9	English composition (two courses, one course must be English composition or its equivalent). Oral communication or advanced composition may be used as an additional course. This requirement is normally satisfied by the graduation requirement at the college the student is attending.
MATHEMATICS	4	3-5	College algebra or pre-calculus or introductory calculus. The course must have as prerequisite 2 years of high school level algebra.
CHEMISTRY	8-15	8-12	General inorganic chemistry including labs. (3 quarters or 2 semesters)
Organic	10-15	5-10	Organic chemistry non-terminal sequence. (2 quarters or 1 semester <u>including one lab</u> )
Biochem	4	3-5	General biochemistry emphasizing metabolic pathways and regulatory mechanisms. Must have as prerequisite organic chemistry substantially meeting the pre-veterinary organic chemistry requirement.
BIOLOGY	4	3-5	General biology introductory course with lab.
Zoology	4	3-5	Introductory zoology course with lab (2 <sup>nd</sup> semester of a general biology sequence normally covers this requirement, or animal biology, cell biology or animal physiology).
Genetics	4	3-5	Science of genetics, not applied or human genetics.
Microbiology	4	3-5	Introductory microbiology. Must have chemistry prerequisite and must include taxonomy, morphology, physiology and ecology of microorganisms.
PHYSICS	10-15	8-12	Introductory sequence. Topics covered need to include mechanics, heat, sound, electricity, light, magnetism, and atomic physics.
LIBERAL EDUCATION	16-20	12-18	<b>Social Science and History</b> and <b>Arts and Humanities</b> courses. Applicants should list no more than two courses from any one single department. Applicants entering the D.V.M. program without a baccalaureate are required to list two courses (6-9 credits) from the social science and history area and two courses from the arts and humanities area (6-9 credits).*

\* **Social Science and History** usually includes courses from anthropology, economics, geography, history, political science, psychology, social science and sociology. **Arts and Humanities** usually include courses from art, literature, music, philosophy, humanities, theater, religion, and foreign literature. **Please note** that introductory and intermediate language courses are usually counted as communication/language courses and not as arts and humanities courses.

D.V.M. students wishing to receive a **Bachelor of Science in Veterinary Science (B.S.V.S.)** at the end of the second year of the D.V.M. program must meet the Liberal Education requirements for the University of Minnesota. These requirements are slightly greater than those described in the Liberal Education section above. The **Diversified Core Requirements** are as follows: 6 credits Social Science, 3 credits Historical Perspective and 6 credits Humanities. In addition, one course of 3 credits must cover each of the following **Designated Themes** of Liberal Education: 1) Environment, 2) Cultural Diversity, 3) International Perspectives and 4) Citizenship and Public Ethics. One course can fulfill requirements for both the Diversified Core and Designated Themes. Only students entering the D.V.M. program without a Bachelor's degree are eligible for the BSVS degree. Diversified Core requirements for Science and Math are automatically met by your pre-veterinary course requirements.

Each semester hour equals 1 1/2 quarter hours - i.e. 4 semester hours = 6 quarter hours. Required courses 2003 Sm & Qtr

	DEPT. / COURSE #	COURSE TITLE	SEMESTER CREDITS	
<b>ENGLISH COMPOSITION</b>	EngC 1011	Univ. Writing & Critical Rdg	4 or equiv.	
	EngC 3027	Advanced Expository Writing	4	
	<b>or the following courses:</b>			
	Rhet 1101	Writing to Inform & Persuade	4 or equiv.	
	Rhet 3562	Technical & Prof. Writing	3	
<b>MATH</b>	Math 1031	College Algebra	3	
	<b>or any of the following Math Courses</b>			
	Math 1051	Precalculus I	3	
	Math 1142	Short Calculus	3	
	Math 1271	Calculus I	4	
<b>CHEMISTRY</b>	Chem 1021	Chemistry Principles I	4	
	General	Chem 1022	Chemistry Principles II	4
	Organic	Chem 2301	Organic Chemistry I	3
		Chem 2311	Organic Chemistry Lab*	3
	(*note-students must be enrolled in Chem 2302 lecture to take this lab - Chem 2302 will not be included in the evaluation of veterinary applicants)			
	Biochemistry	BioC 3021 / Biol 3021	Biochemistry	3
<b>BIOLOGY</b>	General	Biol 1009	General Biology	4
		<b>or the following sequence for biology majors:</b>		
		Biol 1001 & 1002	Intro to Biology I & II	9 or
		GC 1131	Princ. Of Biol. Science	4
	Zoology	Biol 2012	General Zoology	4
		<b>or one of the following:</b>		
		Biol 3211/2005	Animal Physiology/Diversity Lab	4 or
		AnSc 2301	Systemic Physiology	4
	Genetics	GCD 3022	Genetics	3
		or Biol 4003	Genetics	3
Microbiology	VPB 2032 / Biol 2032	Microbiology w/Lab	4	
	or Biol 3301	Biology of Microorganisms	5	
<b>PHYSICS</b>	Phys 1101	Fundamental Physics I	4	
	Phys 1102	Fundamental Physics II	4	
	<b>or one of the following sequences:</b>			
	Phys 1201 & 1202	General Physics I & II	10	
	Phys 1301 & 1302	Introductory Physics I & II	8	
<b>SOCIAL SCIENCE &amp; HISTORY*</b>	<b>See Requirements on Reverse Side</b>		6-9	
<b>ARTS &amp; HUMANITIES *</b>	<b>See Requirements on Reverse Side</b>		6-9	

**Record of Courses  
Required for Admission**

**University of Minnesota  
College of Veterinary Medicine**

This chart is to assist you in planning your pre-veterinary studies in preparation for seeking admission to the Doctor of Veterinary Medicine program.

Courses Required	College <sup>1</sup>	Term & Yr	Course Number	Course Title	Qtr Hrs	Sem <sup>2</sup> Hrs	Grade Rcvd.	Honor Points
ENGLISH COMP Graduation requirement of your college								
MATH Algebra or Calculus								
CHEMISTRY General Chemistry w/labs 2 semesters or 3 quarters								
ORGANIC CHEMISTRY 1 semester w/lab or 2 quarters w/ 1 lab								
BIOCHEMISTRY 1 term, no lab								
BIOLOGY 2 term sequence in general biology w/labs								
GENETICS 1 term								
MICROBIOLOGY 1 term w/lab								
PHYSICS 2 semesters or 3 quarters w/labs								
SOCIAL SCIENCE Usually 2 courses								
HUMANITIES Usually 2 courses								

Total Credits \_\_\_\_\_  
Total Honor Points \_\_\_\_\_

GPA = Honor Points Divided by the Total Number of Credits \_\_\_\_\_

(Honor Points = The number of credits for the course, times the value of the grade i.e. A=4, A-=3.7, B+=3.3, B=3 etc.)

<sup>1</sup> Indicate college where course was or will be taken.

<sup>2</sup> Utilize either the quarter hour column or semester hour column for recording credit hours; if courses were taken under two systems, you may wish to convert credits to one system. Each semester credit equals 1-½ quarter hours. i.e. 4 semester credits = 6 quarter credits.

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## Evaluation of Applicants / Fall 2004 Entering Class

The College of Veterinary Medicine has added a personal interview to the selection criteria for students seeking admission to the fall 2004 entering veterinary class. The "evaluation of applicants" will be a three-stage process including 1) academic measures, 2) non-academic measures and 3) behavioral interview. Applicants not meeting a specific score on the academic measures, as set by the Admissions Committee, will not be considered further. Applicants that are invited to campus for an interview will have their admissions decision based on stages two and three of the review process. The academic record (grades and GRE results) will not play a role in the final admissions decision.

### 1. Academic Measures – Academic Record and Standardized Test Scores

**A. Grade Point Average - Required Pre-Veterinary Courses -** Based on the completed required courses for admission at the conclusion of summer term 2003. Neither fall 2003 or spring 2004 grades will be utilized in the GPA calculations. Repeated courses are to be averaged if retaken within three years; only the new grade is used if it has been three or more years since the course was taken initially. Applicants with a GPA of 2.75 or below on required courses will not receive any points in this area.

**B. Grade Point Average - Most Recent 45 Semester Credits -** The last 45 semester hour credits (or 60 quarter hour credits, whichever is most relevant) of graded course work, counting back from and including summer term 2003 (if enrolled that term). To calculate most recent GPA, count back 45 semester or 60 quarter credits of graded coursework, and include the entire term in which the last credit falls. Applicants with a GPA of 2.75 or below on recent coursework will not receive any points in this area

**C. Graduate Record Exam –** The new version of the Graduate Record Examination (given after October 1, 2002) is required of all applicants to the veterinary program. The applicant's percentile score on each section will be utilized in calculating the number of points. No points will be awarded for percentile ranks at the 35th percentile and below.

### 2. Non-Academic Measures – Experience and Personal Characteristics

Three faculty members on the Admissions Committee will evaluate the non-academic portion of the applicant's VMCAS application file. The average of the three scores will become the applicant's score on the subjective portion of the evaluation. Applicants must achieve one-half of the points awarded in this stage of the review process to be granted an interview

**A. Knowledge of the Veterinary Profession, Knowledge of and Interest in Animals and Professional Goals**  
Experiences with veterinarians, experiences with and responsibility for the care and management of animals, and goals in the profession.

**B. Maturity and Reliability –** Employment experiences and responsibilities, ability to communicate with others, experiences suggesting leadership, extracurricular activities, academic load and the amount of time devoted to employment and other activities while enrolled in college and after.

**3. Behavioral Interview –** Selected applicants will be asked to visit the campus for a one-hour behavioral interview. The behavioral interview is intended to objectively collect and evaluate information, using a series of questions that focus on the competencies required for success in the veterinary profession. A typical question in a behavioral interview would be "tell me about a time when . . ." This allows the applicant to illustrate knowledge, skills and abilities by giving specific examples from past experiences.

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## Fall 2003 – Entering Class Profile

<b>Seats in Class</b>	<b>90</b>	<b>Required Course GPA Mean</b>	<b>3.59</b>
<b>Applications Received</b>	<b>642</b>	Range 2.80-4.00; mid 50% Range 3.41-3.79	
Resident Applicants *	178	<b>Recent Course GPA Mean</b>	<b>3.74</b>
Non-Resident Applicants	464	Range 3.17-4.00; mid 50% Range 3.58-3.89	
* MN, ND, SD and Manitoba, Canada		<b>GRE Combined Score Mean</b>	<b>1190</b> (verbal & quant.)
		Range 910-1480; mid 50% Range 1120-1260	

Applicants from all other states will be considered for approximately 1/3 of the seats in the class. Citizens of other countries will be considered for admission to the D.V.M. program if their pre-veterinary coursework has been taken at an accredited U.S. college or university. International students should contact the Office of Student Affairs regarding specific application guidelines

**Minority and Disadvantaged Students** Members of racial/ethnic minority groups and disadvantaged students are encouraged to apply for admission, regardless of residency. The college maintains no minority quota and requires that all applicants be evaluated by the same selection criteria and meet the same standards for admission as other applicants.

**Application Deadlines** The application deadline for the University of Minnesota D.V.M. program is **October 1<sup>st</sup>** each year (almost a full year in advance of your anticipated start date). The University of Minnesota is a part of the national Veterinary Medical College Application Service (VMCAS). The VMCAS program allows students to use the same application materials for any college of veterinary medicine that is a part of the service.

VMCAS web site <http://aavmc.org> and click on VMCAS or <https://www.vmcas.org>

Applicants are strongly encouraged to use the Web application. The Web application is available beginning June 1<sup>st</sup> of each year. Students not having access to the Web may request a paper application by writing VMCAS at 1101 Vermont Ave. NW, Suite 710, Washington, DC 20005.

**Evaluation of Applicants** The current evaluation includes **Academic Measures, Non-Academic Measures** and a **Behavioral Interview**. The Academic Measures include: 1) G.P.A. in required pre-veterinary classes, 2) G.P.A. on most recent 45 semester credits of coursework, and 3) results of the General Examinations of the Graduate Record Examination. Non-academic measures include: 1) knowledge of the veterinary profession and experience with animals and 2) maturity and reliability of the individual (work experience, community involvement, extra curricular activities and three personal references). Students meeting a specific score on the "academic" and "non-academic" portions of the evaluation will be invited to campus for an interview. Scores from the non-academic section and the interview will determine admission to the program.

**Required Coursework** Your grade point average is calculated on courses required for admission. All required courses must be evaluated with the letter

grading system (A-F) unless the course is only offered (S-N) or pass-fail. Exemption from courses is honored including AP and CLEP credits. Substitution of advanced courses and experience are *not* normally allowed. Required courses need not be completed by the application deadline (October 1st) but must be completed by the end of spring term prior to fall semester admission to the D.V.M. program. Summer school classes (prior to fall semester enrollment in the D.V.M. program) may not be used to complete required pre-veterinary courses. Students granted admission with courses in progress will be granted provisional acceptance and must complete all remaining courses with a grade of "C" or better by the end of spring term.

**Repeated Coursework** If you repeat a *required* course to improve your grade at the same or another institution, the first and second grades will be averaged together if it has been less than three years since the course was taken the first time. If it has been three or more years since the course was first taken, only the second grade will be used in the evaluation.

**Recent Coursework** This G.P.A. is calculated on the most recent 45 semester credits or 60 quarter credits through summer term of the year in which the application is submitted, whether or not the recent courses are those required for admission. The most recent G.P.A. calculation includes all graded courses (including repeated courses) taken over the last 45 semester hours or 60 quarter hours. Grades for the entire term in which the 45th semester credit falls are used when calculating the average.

Policy change – Fall term grades will NOT be included in the calculation of your required course G.P.A. or your recent G.P.A. calculation.

**GRE General Test** The Graduate Record Examination (GRE) General Test is required for admission. You will need to obtain the annual GRE Information and Registration Bulletin, a free publication, from your College's testing center or by writing Graduate Record Examinations, P.O. Box 6000, Princeton, NJ 08541-6000, or visit their web site at [www.gre.org](http://www.gre.org). The GRE is available only through the computer-based testing (CBT) program. Beginning with fall 2004 admission, the new version of the GRE (available after October 1, 2002) which includes the analytical writing section, will be required and all three sections of the new GRE will be used in the evaluation. Applicants who have taken both the old and new version may use Verbal and Quantitative section scores from the old version of the GRE if those scores are higher than those on the new version and have been taken since September 1998.

Official score reports must be sent to the U of Minnesota, St. Paul, College of Veterinary Medicine, Code # 6904.

Policy Change – GRE results for fall 2004 admission must be received by our office by the general application deadline of October 1, 2003.

For U of MN, Twin Cities Campus students, the University Counseling & Consulting Services (612-624-3323) offers individual appointments for test-taking and relaxation techniques. The College of Continuing Education offers GRE preparation courses. Many commercial vendors also offer similar programs.

**Letters of Evaluation** Letters of evaluation are very important and provide very useful information in assessing the quality of your animal and veterinary medical experience, as well as your maturity and reliability. These letters should be from people who know you well and who are in some position to evaluate character and work habits. At least one letter should come from a veterinarian who can document your veterinary experience. Other choices include employers or people with whom you have volunteered, instructors, counselors who know you well, or members of the community.

**Non-Academic Measures** This portion of the application is divided into two sections:

- 1) Knowledge of the Profession and Experience with Animals - This part of the application details the applicant's experiences with veterinarians and experiences with and responsibility for the care and management of animals.
- 2) Maturity and Reliability - This portion takes into consideration the applicant's work experience, leadership skills, extracurricular activities and community involvement.

**Interviews and Processing Fee** Students meeting the minimum criteria on the academic and non-academic sections of the evaluation will be invited to campus for an interview. Interview invitations will be extended in late fall. A \$50 University of Minnesota processing fee will be required of all applicants. Students not submitting the processing fee will not have the non-academic portion of their application reviewed and will not be eligible for an interview. A supplemental application is no longer required by the University of Minnesota. Re-applicants have no priority in admission, nor are they at any disadvantage.

**Delayed Admission** Admitted students may delay entry into the program. Once you are offered admission you may request a one-year deferment. If the Admissions Committee approves the reason(s) for deferment, a place is reserved in the next class.

### **The Twin Cities and St. Paul Campus Community**

The College of Veterinary Medicine is located on the St. Paul campus of the University of Minnesota. The St. Paul campus is located in the heart of the Twin Cities metropolitan area, equal distance from the two downtown areas. About 4,000 of the 40,000 University of Minnesota students are enrolled in one of the five college units on the St. Paul campus. The Twin Cities of Minneapolis and St. Paul has a combined population of approximately 2.5 million people and represents one of the largest metropolitan areas where a veterinary college is located. The Twin Cities is a cultural center for the region, abounds with outdoor recreational opportunities within easy driving distance, and is repeatedly cited as one of the most livable metropolitan areas in the nation.

### **Tuition and Fees 2003-04 (per academic year)**

(Tuition figures subject to change)

Resident Tuition *	\$15,707
Non-Resident Tuition	\$30,463
Student Services Fees	\$628
Books & Supplies	\$600-1,000
Computer (approx.)	\$2,000

(\* MN, ND, SD & MB residents)

**Financial Aid and Scholarships** Loans for first-year students are administered by the Office of Student Finance at the University of Minnesota, 210 Fraser Hall, 106 Pleasant Street SE, Minneapolis, MN 55455, 612-624-1665. Federal Ford Loans (\$8,500 per year limit) and Health Professions Loans (amount determined by needs analysis) are the major sources of funding. The University of Minnesota utilizes the Free Application for Federal Student Aid (FAFSA) as its needs analysis form. FAFSA forms are available after January 1st each year. The code # for the University of Minnesota is 003969. Scholarships to veterinary students are primarily made in the third and fourth year of the program.

### **More Information** Please call, write or e-mail:

Office of Student Affairs and Admissions  
460 VTH, 1365 Gortner Avenue  
St. Paul, MN 55108  
Phone: 612-624-4747  
E-Mail: [dvminfo@umn.edu](mailto:dvminfo@umn.edu)  
Web: [www.cvm.umn.edu](http://www.cvm.umn.edu)

Our office hours are from 8:00 a.m. to 4:30 p.m. Central Standard Time (daylight time, Apr-Oct).

*This publication is available in alternative formats. Please call the Director of Student Affairs & Admissions at 612-624-4747 for assistance.*

The University of Minnesota is an Equal Opportunity Employer and Educator.

7/03

## University of Minnesota College of Veterinary Medicine

460 Veterinary Teaching Hospital  
1365 Gortner Avenue  
St. Paul, MN 55108  
612-624-4747  
dvminfo@umn.edu

### Our Mission and Values

The college's mission is to improve the health and well-being of animals and people through three core activities: educating future and current veterinarians and biomedical scientists; discovering and disseminating new knowledge and skills; and providing innovative veterinary services to the Twin Cities, Minnesota, and beyond.

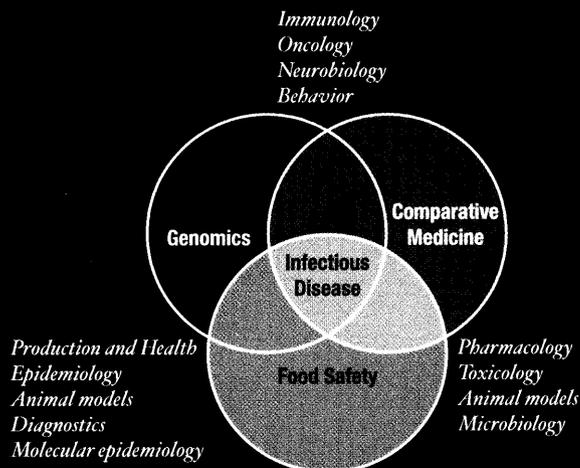
The college's staff and faculty are committed to expressing these values in everything we do:

- **Innovation**—We will enhance animal and human health through novel approaches to discovery and dissemination of knowledge and skills.
- **Learning**—We will be a community of learners offering exceptional lifelong educational opportunities.
- **Professionalism**—We will maintain the highest standards of honesty, integrity, and mutual respect.
- **Service**—We will provide innovative and compassionate service that exceeds our customers' expectations.
- **Communication**—We will facilitate open communication with all constituents to earn and sustain trust and understanding.
- **Collaboration**—We will develop and promote collaborative mission-related efforts.
- **Diversity**—We will have a diverse student body, faculty, and staff and will create a hospitable environment for all.

### Groundbreaking Research

We're proud to claim some of the greatest minds in veterinary research as part of our faculty and staff. The College of Veterinary Medicine is involved in cutting-edge research that has the potential to affect the lives of people across the country and around the globe. Here are our current areas of concentration.

#### Areas of Research



### Collaborating for a Greater Good

College of Veterinary Medicine scientists are committed to advancing the science of veterinary medicine by integrating their research and sharing their findings. Such collaboration is possible through multidisciplinary centers, including the following:

- Advanced Genetic Analysis Center
- Animal Biotechnology Center
- Avian Research Center
- Center for Animal Health and Food Safety
- Center for Dairy Health, Management, and Food Quality
- Minnesota Equine Research Center
- Minnesota Urolith Center
- Raptor Center
- Swine Center
- Swine Disease Eradication Center
- Veterinary Clinical Investigation Center