

# VETERINARY CLINICAL SCIENCES

## Professional Program of Study

For the professional curriculum in veterinary medicine leading to the degree doctor of veterinary medicine, see Veterinary Medicine, Curriculum.

The curriculum of veterinary clinical sciences explores the preventive health care, and diagnosis and treatment of diseases of companion and competitive athletic animals. Veterinary specialists lead didactic and laboratory based learning in the clinical sciences. Experiential based courses conducted through the Veterinary Medical Center during the fourth year provide the student an opportunity to participate in the application of clinical skills and knowledge.

## Graduate Study

The department offers work for the degree master of science with major in veterinary clinical science, and minor work for students majoring in other departments. Within the veterinary clinical sciences major, the student may specialize in veterinary medicine, surgery, or theriogenology. The D.V.M. degree or equivalent is prerequisite to a major graduate work.

Both thesis and nonthesis options are available and require the completion of a minimum of 30 graduate credits and a final examination.

World languages and cultures requirements may be established by the student's program of study committee.

### Courses primarily for professional curriculum students:

#### V C S 305: Shelter Medicine

Cr. 1. S.

*Prereq: Vet Med Classification*

An elective course designed to educate the veterinary student about issues of relevance to companion animal population and shelter medicine and welfare.

#### V C S 311: Veterinarian in Society I

Cr. R. F.

*Prereq: Vet Med Classification*

Introduction to the veterinary profession and the various career opportunities available.

#### V C S 313: Veterinarian in Society III

(1-1) Cr. 1. F.

*Prereq: Vet Med Classification*

A continuation of the Veterinarian in Society series. The course covers selected topics on moral and ethical issues affecting the practice of veterinary medicine. Offered on a satisfactory-fail basis only.

#### V C S 314: Veterinarian in Society IV

(1-0) Cr. 1. F.

*Prereq: Vet Med Classification*

A continuation of the Veterinarian in Society series. This course will focus on helping students develop their communication, leadership, team building and conflict resolution skills.

#### V C S 315: Veterinarian in Society V

(1-0) Cr. 1. S.

*Prereq: Vet Med Classification*

A continuation of the Veterinarian in Society series. This course will emphasize veterinary law. Offered on a satisfactory-fail basis only.

#### V C S 318: Advanced Small Animal Oncology

Cr. 1. S.

*Prereq: Vet Med 3 Classification; V C S 444*

Provide advanced instruction in medical oncology, radiation oncology, and surgical oncology. General learning objectives include demonstrating the ability to utilize information from the physical exam and historical findings to direct appropriate diagnostics and staging based on a specific cancer diagnosis. Offered on a satisfactory-fail basis only.

#### V C S 339: Clinical Foundations I

(Cross-listed with B M S). (0-2) Cr. 1. F.

*Prereq: First-year classification in veterinary medicine*

Canine physical examination; basic behavior, animal handling and restraint; medical record keeping.

#### V C S 385: Grand Rounds

Cr. R. Repeatable. F.S.

*Prereq: Vet Med Classification*

Seminars and case presentations on selected clinical subjects by fourth-year students of the College of Veterinary Medicine. Attendance is required for a passing grade. Offered on a satisfactory-fail basis only.

#### V C S 391: Clinical Imaging

(1-0) Cr. 1. F.

*Prereq: Vet Med Classification*

Evaluation of morphologic anatomy of the dog and cat utilizing clinical imaging methods - radiography, ultrasonography, computed tomography, magnetic resonance imaging and nuclear imaging. Emphasis will be placed on normal radiographic anatomy.

#### V C S 393: Principles of Surgery

(2-2) Cr. 3. F.

*Prereq: Vet Med Classification*

General principles of surgery of companion animals.

**V C S 394: Principles of Surgery Laboratory**

(0-3) Cr. 1. S.

*Prereq: Vet Med Classification*

General principles of surgery of companion animals.

**V C S 395: Small Animal Surgery**

(2-0) Cr. 2. S.

*Prereq: Vet Med Classification*

Small animal surgery.

**V C S 396: Fundamentals in Equine Practice**

(2-0) Cr. 2. S.

*Prereq: Vet Med Classification*

This elective course is an introduction and overview of the clinical aspects of common conditions in horses and related conditions, including pathogenesis, clinical manifestations, diagnosis, treatment and prognosis. It is not designed to teach the student how to perform specific procedures, but rather to improve knowledge base of students interested in equine or mixed animal practice. Class will include lecture, photos, video presentations, and other formats.

**V C S 398: Anesthesiology**

(2-0) Cr. 2. S.

*Prereq: Vet Med Classification*

Anesthetic equipment, agents and procedures, including pain management for core species.

**V C S 399: Ophthalmology**

(1-0) Cr. 1. S.

*Prereq: Vet Med Classification*

Principles and techniques of medical and surgical ophthalmology.

**V C S 402: Clinical Cardiology I**

(1-0) Cr. 1. F.

*Prereq: Vet Med 3 or 4 Classification*

Elective course in diagnosis and management of cardiac diseases. Emphasis on interpretation of electrocardiography.

**V C S 403: Clinical Cardiology II**

Cr. 1. S.

*Prereq: Vet Med 3 Classification*

Elective course in clinical cardiology. Emphasis on common congenital and acquired cardiac diseases of companion animals. Builds on foundation of basic clinical cardiac knowledge obtained in V C S 444; expands to cover additional diseases in greater depth (e.g. infective endocarditis, systemic and pulmonary hypertension, heartworm disease, feline arterial thromboembolism, bradyarrhythmias and cardiac pacing, congenital heart diseases and interventional correction). Offered on a satisfactory-fail basis only.

**V C S 404: Topics in Emergency and Critical Care**

Cr. 2. S.

*Prereq: Vet Med 3 Classification*

Introduction of common topics in emergency and critical care in companion animals. General learning goals for students in this course include developing the ability to utilize physical exam skills and historical findings to triage patients and assess stability.

**V C S 405: Pet Bird and Exotic Species Medicine**

(1-3) Cr. 2. S.

*Prereq: Vet Med 3 Classification*

Elective course in management and diseases of pet birds and exotic species.

**V C S 406: Introduction to Captive Wild Animal Medicine**

Cr. 1. S.

*Prereq: Vet Med 3 Classification*

Topics covering the health and welfare of non-domestic animals in captivity. Regulations specific to exotic animal ownership and exhibition will be covered. Students will discuss diseases which affect multiple taxon groups, and learn about interface diseases. Specific topics regarding the veterinary care of exotic canids, felids, ungulates, primates, Old-World Camelids, exotic equids and avian species will be discussed. Laboratories will introduce remote-delivery and restraint devices, dangerous animal handling techniques (including venomous snake handling techniques), contraception for non-domestic animals, and extra-label use of medications and vaccines in non-domestic species.

**V C S 407: Feline Internal Medicine**

(1-0) Cr. 1. F.

*Prereq: Vet Med 3 Classification*

Elective course in feline internal medicine.

**V C S 409: Oncology**

Cr. 2. Repeatable, maximum of 4 credits.

*Prereq: Vet Med 4 Classification*

Elective clinical assignment in oncology.

**V C S 414: Companion Animal Nutrition**

(1-0) Cr. 1. S.

*Prereq: Vet Med 3 or 4 Classification*

Elective course in small animal and equine nutrition.

**V C S 415: Advanced Small Animal Dermatology**

(1-2) Cr. 2. F.S.

*Prereq: Vet Med 4 Classification*

Elective course in dermatology. Offered on a satisfactory-fail basis only.

**V C S 419: Preceptorship in Companion Animal/Equine Veterinary Medical Practice**

Cr. 2-6. Repeatable, maximum of 6 credits. F.S.SS.

*Prereq: Vet Med 4 Classification*

Elective course in veterinary practice under the guidance of veterinarians in approved practice settings. Maximum of 6 credits in 2 credit increments. Instructor Permission needed if not a VM4 classification.

**V C S 420: Practicum**

Cr. R. Repeatable.

*Prereq: Vet Med 4 Classification*

External practical experiences in the fourth year curriculum for additional professional development of the veterinary student. Instructor Permission needed if not a WM4 classification. Offered on a satisfactory-fail basis only.

**V C S 423: Zoo Preceptorship**

Cr. 2-12. Repeatable, maximum of 12 credits. F.S.SS.

*Prereq: (V C S 405 or V C S 406); Permission of Instructor*

Elective course in veterinary practice under the guidance of trained zoo veterinarians in approved practice settings. Maximum of 12 credits.

**V C S 436: Small Animal Internal Medicine**

(3-0) Cr. 3. F.

*Prereq: Vet Med 3 Classification*

Clinical diagnosis and treatment of diseases of small animals.

**V C S 437: Small Animal Shelter Medicine**

(2-0) Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

A 2-week elective rotation at an animal shelter/humane society that works with the public to place pets in homes. This rotation will encompass population medicine (medicine, surgery, intake, adoption, behavior and temperament, neglect and cruelty) that animal shelters deal with on a daily basis. The selected animal shelter/humane society must have a veterinarian(s) on staff and be approved by the course coordinator. More than one VCS 437 may be taken upon approval of the course coordinator.

**V C S 440: Introduction to Clinics**

Cr. R. S.

*Prereq: Vet Med Classification*

Rotating assignments through multiple sections within the Veterinary Medical Center.

**V C S 441: Canine Rehabilitation**

Cr. 2.

*Prereq: Vet Med 4 Classification*

Elective clinical assignment in rehabilitation.

**V C S 443: Equine Lameness**

(1-2) Cr. 2. S.

*Prereq: Vet Med 2 or 3 Classification*

Orthopedic diseases of the equine.

**V C S 444: Small Animal Medicine**

(4-0) Cr. 4. F.S.

*Prereq: Vet Med Classification*

Clinical diagnosis and treatment of diseases of small animals.

**V C S 445: Equine Medicine**

(2-0) Cr. 2. F.

*Prereq: Vet Med Classification*

Clinical diagnosis and treatment of diseases of equine.

**V C S 446: Clinical Neurology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical rotation in neurology with an emphasis on neurolocalization, disease processes, use of diagnostics in medical and surgical neurology and treatment options. Exposure to neurosurgical techniques.

**V C S 447: Equine Veterinary Diagnostic Skills**

(3-0) Cr. 2. S.

*Prereq: Vet Med 4 Classification*

Hands on experience with equine veterinary diagnostic skills related to theriogenology, medicine, surgery, radiology, and ophthalmology. Preference to equine track student.

**V C S 448: Diagnostic Imaging and Radiobiology**

(2-2) Cr. 3. F.S.

*Prereq: Vet Med Classification*

Essentials of diagnostic image interpretation. Essentials of radiobiology, radiation therapy and protection from radiation.

**V C S 449: Junior Surgery Laboratory**

(1-6) Cr. 3. F.

Pre-laboratory presentations and laboratories introduce the student to anesthetic and surgical principles and techniques that can be applied to all animal species.

**V C S 449B: Junior Surgery Laboratory: Traditional Curriculum**

(1-6) Cr. 3. F.

*Prereq: Vet Med Classification*

This laboratory introduces the student to anesthetic and surgical principles and techniques that can be applied to all animal species. Provides a broader range of surgical experiences throughout the laboratory.

**V C S 451: Advanced Junior Surgery Laboratory**

(1-6) Cr. 2. S.

*Prereq: Vet Med 3 Classification*

8 weeks. Continuation of surgical laboratory experience. Techniques and advanced principles learned are applicable to all animal species.

**V C S 451B: Advanced Junior Surgery Laboratory: Traditional Curriculum**

(1-6) Cr. 2. Repeatable. S.

*Prereq: Vet Med 3 Classification*

8 weeks. Continuation of surgical laboratory experience. Techniques and advanced principles learned are applicable to all animal species. Exposure to more advanced surgical techniques with most surgical principles.

**V C S 451C: Advanced Junior Surgery Laboratory: Traditional Curriculum**

(1-6) Cr. 2. S.

*Prereq: Vet Med 3 Classification*

8 weeks. Continuation of surgical laboratory experience. Techniques and advanced principles learned are applicable to all animal species. A second repeat for students with a special interest in small animal surgery.

**V C S 452: Clinical Dermatology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Study of clinical dermatological problems via computer-aided instruction, case simulations, and/or lectures. Clinical management of cases presented to Veterinary Medical Center. Instructor Permission needed if not a VM4 classification.

**V C S 453: Small Animal Medicine I**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in small animal medicine.

**V C S 455: Small Animal Soft Tissue Surgery**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in soft tissue surgery.

**V C S 456: Small Animal Orthopedic Surgery**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in orthopedic surgery.

**V C S 457: Equine Medicine**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in equine medicine.

**V C S 458: Equine Surgery**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in equine surgery.

**V C S 459: Small Animal Overpopulation Medicine and Surgery**

Cr. 2.

*Prereq: Vet Med 4 Classification*

A 2-week surgical emphasis, elective rotation at a humane society that addresses the issues facing veterinarians and non-veterinary humane society personnel who deal with small animal overpopulation issues. Each section can be taken for credit once.

**V C S 459A: Small Animal Overpopulation Medicine and Surgery :Nebraska Humane Society, Omaha NE**

Cr. 2.

*Prereq: Vet Med 4 Classification*

A 2-week surgical emphasis, elective rotation at a humane society that addresses the issues facing veterinarians and non-veterinary humane society personnel who deal with small animal overpopulation issues. Each section can be taken for credit once.

**V C S 459C: Small Animal Overpopulation Medicine and Surgery: WaySide Waifs, Kansas City MO**

Cr. 2.

*Prereq: Vet Med 4 Classification*

A 2-week surgical emphasis, elective rotation at a humane society that addresses the issues facing veterinarians and non-veterinary humane society personnel who deal with small animal overpopulation issues. Each section can be taken for credit once.

**V C S 459D: Small Animal Overpopulation Medicine and Surgery: Boulder Humane Society, Boulder, CO**

Cr. 2.

*Prereq: Vet Med 4 Classification*

A 2-week surgical emphasis, elective rotation at a humane society that addresses the issues facing veterinarians and non-veterinary humane society personnel who deal with small animal overpopulation issues. Each section can be taken for credit once.

**V C S 459E: Small Animal Overpopulation Medicine and Surgery: ASPCA Spay/Neuter Alliance, Asheville, NC**

Cr. 2.

*Prereq: Vet Med 4 Classification*

A 2-week surgical emphasis, elective rotation at a humane society that addresses the issues facing veterinarians and non-veterinary humane society personnel who deal with small animal overpopulation issues. Each section can be taken for credit once.

**V C S 460: Radiology**

Cr. 2.

*Prereq: Vet Med 4 Classification*

Clinical assignment in veterinary radiology.

**V C S 463: Primary Care**

Cr. 2. Repeatable, maximum of 4 credits.

*Prereq: Vet Med 4 Classification*

Clinical experience in hospital based general practice.

**V C S 464: Equine Field Services**

Cr. 2.

*Prereq: Vet Med 4 Classification*

Clinical assignment in equine ambulatory practice.

**V C S 465: Farrier**

Cr. 2.

*Prereq: Vet Med 4 Classification*

Elective clinical assignment on the principles and practices of normal and therapeutic horseshoeing and equine foot care.

**V C S 466: Anesthesiology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in small animal and large animal anesthesiology.

**V C S 468: Intensive Care**

Cr. 4. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment to provide supervision of hospital cases requiring intensive care and including emergency cases.

**V C S 469: Ophthalmology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Clinical assignment in ophthalmology.

**V C S 475: Cardiology Rotation**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Elective clinical assignment in cardiology.

**V C S 476: Veterinary Anesthesiology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Assignments in equine, small animal, and large animal anesthesiology. Experience includes case work-up, management and recovery. Understanding of the unique physiology and potential complications of anesthetized patients. Pharmacology of commonly used drugs. Specific protocols and management for both field and general anesthesia.

**V C S 476E: Equine Anesthesiology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Assignments in equine, small animal, and large animal anesthesiology. Experience includes case work-up, management and recovery. Understanding of the unique physiology and potential complications of anesthetized patients. Pharmacology of commonly used drugs. Specific protocols and management for both field and general anesthesia.

**V C S 476S: Small Animal Anesthesiology**

Cr. 2. Repeatable.

*Prereq: Vet Med 4 Classification*

Assignments in equine, small animal, and large animal anesthesiology. Experience includes case work-up, management and recovery. Understanding of the unique physiology and potential complications of anesthetized patients. Pharmacology of commonly used drugs. Specific protocols and management for both field and general anesthesia.

**V C S 478: Intensive and Critical Care**

(2-0) Cr. 2. Repeatable, maximum of 4 credits. F.S.SS.

*Prereq: Vet Med 4 Classification*

Elective clinical assignment in intensive care.

**V C S 480: Veterinary Dentistry**

Cr. 1. F.

*Prereq: Vet Med 3 or 4 Classification*

All aspects of veterinary dentistry, prophylaxis, endodontics, and orthodontics. This course is an on-line course. Offered on a satisfactory-fail basis only.

**V C S 481: Advanced Equine Dentistry**

Cr. 2. S.

*Prereq: Vet Med 4 Classification*

Clinical rotation in equine dentistry with an emphasis on routine equine dental examinations, specialized equipment, and corrective procedures. Offered only offered for one 2-week rotation. Enrollment is limited.

**V C S 490: Independent Study**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

Independent Study in veterinary medicine focusing on basic / translational research or learning issues. Enrollment in this course is not appropriate for clinical experiences in the Veterinary Medical Center or extramural experiences in clinical veterinary practice (i.e., preceptorships).

**V C S 492: Orientation for International Experience**

(2-0) Cr. 1. Repeatable. S.

*Prereq: Vet Med Classification*

8 weeks. Predeparture orientation for group study abroad. Cultural considerations for the study abroad experience and a conversational language introduction. Out of class work may be assigned.

**V C S 495: Grand Rounds Presentations**

Cr. R. S.

*Prereq: Vet Med 4 Classification*

Seminars and case presentations on selected subjects by fourth year students of the College of Veterinary Medicine. Completion of a seminar presentation is required for graduation. Offered on a satisfactory-fail basis only.

**V C S 496: International Experience**

Cr. 1-12. Repeatable.

*Prereq: Vet Med Classification*

International Preceptorships and Study Abroad Group programs. Opportunities for students to be involved in applied clinical, production, and/or research experiences in international locations. The course consists of 40 hour per week experiential learning opportunities.

**Courses primarily for graduate students, open to qualified undergraduates:**

**V C S 590: Special Topics**

Cr. 1-3. Repeatable.

*Prereq: Permission of Instructor*

**V C S 590A: Special Topics: Medicine**

Cr. 1-3. Repeatable.

*Prereq: Permission of Instructor*

**V C S 590B: Special Topics: Surgery**

Cr. 1-3. Repeatable.

*Prereq: Permission of Instructor*

**V C S 590C: Special Topics: Theriogenology**

Cr. 1-3. Repeatable.

*Prereq: Permission of Instructor*

**V C S 590D: Special Topics: Radiology**

Cr. 1-3. Repeatable.

*Prereq: Permission of Instructor*

**V C S 590E: Special Topics: Anesthesiology**

Cr. 1-3. Repeatable.

*Prereq: Permission of Instructor*

**V C S 590F: Special Topics - Ophthalmology**

Cr. 1-3. Repeatable, maximum of 3 credits. F.S.

*Prereq: Permission of Instructor*

Special topics in Ophthalmology.

**V C S 596: International Preceptorship**

Cr. 1-12. Repeatable. F.S.SS.

*Prereq: Admission to Graduate college*

International Preceptorships and Study Abroad Group programs. Provides opportunities for students to be involved in applied clinical, production, and/or research experiences in international locations. The course consists of 40 hour per week experiential learning opportunities.

**V C S 599: Creative Component**

Cr. arr.

*Prereq: Permission of Instructor*

**Courses for graduate students:**

**V C S 604: Seminar**

Cr. 1. Repeatable. F.S.

**V C S 640: Advanced Radiology**

(2-0) Cr. 2.

*Prereq: V C S 448*

Detailed principles of clinical radiology with particular reference to radiographic interpretation.

**V C S 676: Advanced Medicine**

(2-0) Cr. 2.

*Prereq: V C S 445*

Principles of general medicine. A study in depth of factors that contribute to the development of clinical signs as related to the pathogenesis of disease.

**V C S 677: Advanced Medicine**

(2-0) Cr. 2.

*Prereq: V C S 445*

An advanced study of metabolic diseases.

**V C S 699: Research**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

**V C S 699A: Research: Medicine**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

**V C S 699B: Research: Surgery**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

**V C S 699C: Research: Theriogenology**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

**V C S 699E: Research: Anesthesiology**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

**V C S 699F: Research: Ophthalmology**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

Graduate Level Research.

**V C S 699G: Research: Cardiology**

Cr. arr. Repeatable.

*Prereq: Permission of Instructor*

Graduate Level Research.