Department of Clinical Sciences

Office in Veterinary Teaching Hospital, 300 West Drake Road, Room A201
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cvmbs.colostate.edu/clinsci (http://www.cvmbs.colostate.edu/clinsci)

Professor Christopher Orton, Department Head

Faculty in the Department of Clinical Sciences participate in training professional veterinary medical students and graduate students. For the veterinary medical student curriculum, students are instructed in the diagnosis, medical and surgical treatment, and prevention and management of domestic and exotic animal diseases. Through field service clinical experience, students receive on-the-farm training in livestock herd health management and production medicine. Our major clinical training center is the Veterinary Teaching Hospital, which operates state-of-the-art primary and referral services in all areas of small animal medicine and surgery, equine, and agricultural animal clinical care.

Undergraduate

No undergraduate major is offered.

Graduate

Graduate Programs in Clinical Sciences

Graduate programs offered in the department lead to Master of Science or Doctor of Philosophy degrees. Particular research focus areas within the department include epidemiology, musculoskeletal diseases, cancer biology, cardiovascular diseases, regenerative medicine, and infectious diseases of animals.

The department also offers a three-year combined master’s degree and residency program in large and small animal surgery, anesthesiology, cardiology, internal medicine, neurology, oncology, ophthalmology, dermatology, sports medicine and rehabilitation, and emergency and critical care medicine. These training programs partially fulfill requirements for board certification in these specialties. Students interested in graduate work should refer to the Graduate and Professional Bulletin and the Department of Clinical Sciences (http://www.cvmbs.colostate.edu/clinsci).

Master Programs

• Master of Science in Clinical Sciences

Ph.D.

• Ph.D. in Clinical Sciences*

* Please see department for program of study.

Courses

Clinical Sciences (VS)

VS 313 Prevention and Control of Livestock Diseases Credits: 3 (3-0-0)
Also Offered As: ANEQ 313.
Course Description: Common ailments of livestock; sanitation and disease prevention and control.
Prerequisites: (ANEQ 230 or BMS 300 or ANEQ 305) and (ANEQ 310, may be taken concurrently and ANEQ 320, may be taken concurrently).
Registration Information: Junior or senior standing. Credit not allowed for both VS 313 and ANEQ 313.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

VS 331 Histology Credits: 4 (3-2-0)
Course Description: Analysis of animal cells, tissues, and organs emphasizing light microscopy.
Prerequisite: BMS 300.
Registration Information: Must register for lecture and laboratory. Credit not allowed for both VS 331 and BMS 330. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

VS 333 Domestic Animal Anatomy Credits: 4 (3-3-0)
Course Description: Comparative functional anatomy of the dog, horse, and cow.
Prerequisite: BZ 110 or LIFE 102.
Registration Information: Must register for lecture and laboratory. Credit not allowed for both VS 333 and BMS 305. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

VS 479 Biology and Behavior of Dogs Credits: 3 (3-0-0)
Also Offered As: BZ 479.
Course Description: Interactions of physiology, neurobiology, and genetics on behavior of domestic dogs, and how evolution and domestication influence behavioral traits.
Prerequisite: LIFE 103 or BZ 110.
Registration Information: Credit not allowed for both VS 479 and BZ 479. Sections may be offered: Online.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.
### VS 495 Independent Study
- **Credits:** Var[1-18]
- **Course Description:**
- **Prerequisite:** None.
- **Terms Offered:** Fall, Spring, Summer.
- **Grade Mode:** Instructor Option.
- **Special Course Fee:** No.

### VS 533 Epidemiology of Infectious Diseases/Zoonoses
- **Credits:** 3 (2-0-1)
- **Also Offered As:** MIP 533.
- **Course Description:** Epidemiologic features of infectious and parasitic diseases that have a major impact on community medicine.
- **Prerequisite:** MIP 300.
- **Registration Information:** Must register for lecture and recitation. Credit not allowed for both VS 533 and MIP 533.
- **Term Offered:** Spring.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 562 Applied Data Analysis
- **Credits:** 3 (3-0-0)
- **Course Description:** Data management, application and interpretation of statistical analysis, and reporting of results for students in health science fields.
- **Prerequisite:** STAT 301 or STAT 307.
- **Registration Information:** Credit not allowed for VS 562, EDRM 606 and PBHL 560.
- **Term Offered:** Spring.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 570 Issues in Animal Agriculture
- **Credits:** 2 (2-0-0)
- **Also Offered As:** AGRI 570.
- **Course Description:** Issues that have a major impact on the direction of changes in animal agriculture.
- **Prerequisite:** None.
- **Registration Information:** Credit not allowed for both VS 570 and AGRI 570.
- **Term Offered:** Fall (even years).
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 579 Animal Behavior in Captive Populations
- **Credits:** 3 (3-0-0)
- **Also Offered As:** NSCI 579.
- **Course Description:** How animals learn, perceive their world and behave, and how all of those intersect to alter behavior in captive settings.
- **Prerequisite:** BZ 300.
- **Registration Information:** Enrollment in the M.P.N.S., Zoo, Aquarium, and Shelter Management specialization can substitute for BZ 300. Credit not allowed for both VS 579 and NSCI 579.
- **Terms Offered:** Fall, Spring.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 602 Critical Evaluation of Scientific Literature
- **Credits:** 2 (1-0-1)
- **Course Description:** Method of evaluating scientific literature. Students present critiques of papers they have chosen.
- **Prerequisite:** None.
- **Restriction:** Must be a: Graduate, Professional.
- **Registration Information:** Must register for lecture and recitation.
- **Term Offered:** Fall.
- **Grade Mode:** S/U Sat/Unsat Only.
- **Special Course Fee:** No.

### VS 605 Comparative Anesthesiology
- **Credits:** 2 (2-0-0)
- **Course Description:** Techniques in anesthesia for large and small animals.
- **Prerequisite:** None.
- **Restriction:** Must be a: Graduate, Professional.
- **Term Offered:** Spring (every third year).
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 612 Plastic and Reconstructive Surgery
- **Credits:** 2 (2-0-0)
- **Course Description:** Advances in surgical patient care, surgical instrumentation, and reconstruction.
- **Prerequisite:** None.
- **Restriction:** Must be a: Graduate, Professional.
- **Registration Information:** Concurrent registration in VS 605.
- **Term Offered:** Fall.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 613 Plastic and Reconstructive Surgery Laboratory
- **Credits:** 1 (0-3-0)
- **Course Description:** Techniques in anesthesia for large and small animals.
- **Prerequisite:** None.
- **Restriction:** Must be a: Graduate, Professional.
- **Registration Information:** DVM degree or equivalent professional medicine degree.
- **Term Offered:** Fall.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 626 Infertility and Genital Disease
- **Credits:** 2 (2-0-0)
- **Course Description:** Infectious and noninfectious causes of reproductive failure in food animals.
- **Prerequisite:** None.
- **Restriction:** Must be a: Graduate, Professional.
- **Term Offered:** Fall (every third year).
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

### VS 628 Physiology and Pathophysiology
- **Credits:** 3 (3-0-0)
- **Course Description:** Overview of the normal physiology and pathophysiology of disease states of mammalian organ systems.
- **Prerequisites:** BMS 500 and BMS 501.
- **Restriction:** Must be a: Graduate, Professional.
- **Registration Information:** DVM degree or equivalent professional medicine degree can substitute for BMS 500; BMS 501.
- **Term Offered:** Fall.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.
VS 630 Orthopedic Surgery  Credits: 3 (3-0-0)
Course Description: Techniques, devices, and prosthetic materials in rehabilitating musculoskeletal problems.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 631 Orthopedic Surgery Laboratory  Credit: 1 (0-3-0)
Course Description: Procedures applied to skeletal preparations and living animals.
Prerequisites: (VM 786A or VM 786B) and (VS 630, may be taken concurrently).
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 642 Ophthalmology  Credits: 5 (4-2-0)
Course Description: Instrumentation, ocular therapeutics, and clinical ophthalmology.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

VS 645 Surgery of the Eye  Credits: 3 (2-3-0)
Course Description: Techniques, indications, and complications.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 648 Food Animal Production and Food Safety  Credits: 2 (2-0-0)
Also Offered As: VM 648.
Course Description: Basic orientation to food animal production units, herd health concepts, and issues of food safety from preharvest through processing and distribution.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Enrollment in Food Science/Safety Graduate Interdisciplinary Studies program required. Credit not allowed for both VS 648 and VM 648.
Term Offered: Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 650 Comparative Abdominal Surgery  Credits: 3 (3-0-0)
Course Description: New techniques in surgery of abdominal viscera.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 651 Comparative Abdominal Surgery Laboratory  Credit: 1 (0-3-0)
Course Description: Reparative and reconstructive abdominal surgical procedures.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: DVM degree or equivalent professional medicine degree required.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 655 Echocardiography in Veterinary Medicine  Credits: 3 (2-3-0)
Course Description: Technical proficiency in obtaining echocardiographic images; fundamental understanding of diagnostic criteria for common cardiac disease in dogs and cats.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: DVM degree or equivalent professional medicine degree required. Must register for lecture and laboratory.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

VS 660 Neurology and Neurosurgery  Credits: 3 (3-0-0)
Course Description: Diagnostic and surgical techniques for the nervous system.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 661 Neurology and Neurosurgery Laboratory  Credit: 1 (0-3-0)
Course Description: Production and correction of surgically amenable lesions in central and peripheral nervous system; electrodiagnosis.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: DVM degree or equivalent professional medicine degree required.
Term Offered: Spring (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 673 Thoracic and Cardiovascular Surgery  Credits: 3 (3-0-0)
Course Description: Surgical approaches to the thorax and the central and peripheral cardiovascular system.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: DVM degree or equivalent professional medicine degree required.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 674 Thoracic and Cardiovascular Surgery Laboratory  Credit: 1 (0-3-0)
Course Description: Surgical procedures applied to the chest, heart, and vessels.
Prerequisites: (VM 786A or VM 786B) and (VS 673, may be taken concurrently).
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.
VS 699  Thesis Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 701 Postgraduate Medicine I Credits: Var[1-3]
Course Description: Comprehensive review, update of immunology, emergency medicine, dermatology, and endocrinology.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 702 Postgraduate Medicine II Credits: Var[1-3]
Course Description: Comprehensive review, update of neurology, gastroenterology, and ophthalmology.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 703 Postgraduate Medicine III Credits: Var[1-3]
Course Description: Comprehensive review, update of oncology, cardiology, reproduction, ophthalmology, and radiology.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 704 Postgraduate Medicine IV Credits: Var[1-3]
Course Description: Comprehensive review, update of hematology, nephrology, urology, respiratory, hepatic, and pancreatic.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring (every third year).
Grade Mode: Traditional.
Special Course Fee: No.

VS 716 Advanced Studies in Reproduction Credits: 2 (2-0-0)
Course Description: Biochemical and physiological basis for problems in reproduction.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

VS 718 Cancer Biology Clinical Practicum Credits: 2 (0-0-4)
Course Description: Exposes graduate students engaged in laboratory cancer research to cancer from a clinical perspective, through VTH clinical rotations.
Prerequisite: ERHS 510.
Term Offered: Summer.
Grade Mode: Traditional.
Special Course Fee: No.

VS 733 Advanced Veterinary Epidemiology Credits: 4 (4-0-0)
Course Description: Advanced epidemiological and statistical techniques for the design and analysis of research projects.
Prerequisites: (ERHS 532) and (ERHS 542 or ERHS 544 or STAT 511 or STAT 512 or VS 662).
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

VS 750 Clinical and Applied Pharmacology Credits: 2 (2-0-0)
Course Description: Factors involved in drug dosing and variability of drug response. Applications in veterinary and human medicine.
Prerequisite: BMS 450.
Registration Information: DVM degree or equivalent professional medicine degree can substitute for BMS 450.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

VS 784 Supervised College Teaching Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 792 Seminar Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795A Independent Study: Small Animal Medicine Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795B Independent Study: Large Animal Medicine Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795C Independent Study: Small Animal Surgery Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.
VS 795D  Independent Study: Equine Surgery  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795N  Independent Study: Ophthalmology  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795G  Independent Study: Equine Orthopedics  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795O  Independent Study: Herd Health Management  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795H  Independent Study: Large Animal Reproduction  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795P  Independent Study: Equine Lameness  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795S  Independent Study: Epidemiology  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 795T  Independent Study: Human-Animal Bond  Credits: Var[1-5]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 796  Group Study-Medicine  Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Maximum of 5 credits allowed in course.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

VS 798  Research  Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.
VS 799  Dissertation  Credits: Var[1-18]

Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.