

**LARGE ANIMAL  
CLINICAL SCIENCES    LCS**

**Department of Large Animal  
Clinical Sciences  
College of Veterinary Medicine**

- 423    Principles of Fish and Wildlife Disease**  
Fall of odd years. 3(3-0) Interdepartmental with Fisheries and Wildlife. Administered by Fisheries and Wildlife. P: (BS 162 and BS 172) or (BS 182H and BS 192H) or LB 144 RB: Additional course work in ecology, zoology, microbiology or environmental science. R: Open to juniors or seniors or graduate students in the College of Agriculture and Natural Resources or in the College of Natural Science or in the College of Veterinary Medicine or approval of department.  
Diseases of fish and wildlife species. Disease detection and diagnosis. Ecological and epidemiological analysis and management of major classes of wildlife diseases. Threatened and endangered species, game species, and fish and wildlife species that serve as vectors or reservoirs of human and domestic animal diseases.
- 423L    Principles of Fish and Wildlife Disease Laboratory**  
Fall of odd years. 1(0-3) Interdepartmental with Fisheries and Wildlife. Administered by Fisheries and Wildlife. RB: Additional laboratory course work in ecology, zoology, microbiology or environmental sciences. C: FW 423 concurrently.  
Tools for diagnosis and assessment of disease in fish and wildlife populations.
- 463    Wildlife Disease Ecology**  
Spring of even years. 3(3-0) Interdepartmental with Fisheries and Wildlife. Administered by Fisheries and Wildlife. P: IBIO 355 or approval of department RB: (FW 423) or additional course work in integrative biology, microbiology and environmental sciences. R: Open to juniors or seniors or approval of department. Not open to students with credit in FW 863.  
Role of wildlife disease in ecological interactions. Factors underlying pathogen emergence. Disease modeling. Conservation medicine.
- 560    Clinical Competencies II**  
Spring. 1(0-2) R: Open to graduate-professional students in the College of Veterinary Medicine.  
Basic diagnostics and therapeutics for application to large animal practice.
- 562    Care and Management of the Neonatal Foal**  
Spring. 1(1-0) RB: Completion of year 1 in the graduate professional curriculum. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Weekly seminars focusing on common diseases. Case presentations.
- 563    Bovine Pregnancy Diagnosis**  
Fall. 1(1-1) RB: Completion of year 2 in the graduate professional curriculum. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Basic reproductive physiology. Farm based laboratories in bovine transrectal palpation and sonography. Field trips required.
- 564    Nutritional Management of Dairy Cow Health**  
Spring. 1(1-1) RB: Completion of year 1 in the graduate professional curriculum. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Diet formulation for promotion of dairy cow health and prevention of peripartum disease.
- 565    Equine Sports Medicine**  
Fall. 1(1-0) RB: Completion of year 2 in the graduate professional curriculum. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Physiologic responses to exercise and discipline specific disorders of equine athletes.
- 566    Current Topics in Food Systems Veterinary Medicine**  
Fall. 1(1-0) R: Open to graduate-professional students in the College of Veterinary Medicine and open to graduate students in the College of Veterinary Medicine.  
Techniques in management, interpretation and application of new knowledge in the scientific literature of food systems veterinary medicine.
- 568    Biological Risk Management for Beef and Dairy Farms**  
Fall. 1(1-0) RB: Completion of year 2 in the graduate professional curriculum. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Principles and methods used to reduce the introduction and spread of infectious disease agents on beef and dairy farms. Field trip required.
- 569    Sport Horse Evaluation, Rehabilitation and Therapy**  
Spring. 1(1-0) RB: Completion of year 1 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Hands-on diagnostic evaluation and treatment of the equine athlete. Traditional medical approaches, acupuncture, and chiropractic manipulation.
- 590    Selective Topics in Large Animal Clinical Sciences**  
Fall, Spring. 1(1-0) RB: Year 1 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Important field of study in Large Animal Clinical Sciences.
- 610    Clinical Problems in Large Animal Clinical Sciences**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Approval of department.  
Advanced clinical training in a problem related to large animal clinical sciences.
- 611    Research Problems in Large Animal Clinical Sciences**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Approval of department.  
Research related to a large animal specialty.
- 613    Special Problems in Large Animal Clinical Sciences at Off-Campus Sites**  
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Approval of department.  
Advanced clinical-phase training in large animal clinical sciences for which on-campus training is not available. Individualized problems and training objectives.
- 614    Equine Clinical Proficiency Clerkship**  
Spring. 3 credits. P: VM 553 RB: Completion of semester 5 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Field and practitioner-based clinical techniques, training, and hands-on experience for future equine practitioners.
- 615    Equine Emergency and Critical Care Clerkship**  
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Lectures, laboratories, seminars, and emergency on-call clinical case evaluation, treatment, and management.
- 616    Large Animal Medicine and Surgery**  
Fall, Spring, Summer. 6(6-0) RB: Completion of semester 5 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Diagnosis and management of individual medical and surgical cases, as part of a veterinary patient care team, in the large animal veterinary teaching hospital and at the Training Center for Dairy Professionals.
- 621    Practice Based Ambulatory Clerkship**  
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Supervised, off-campus experience in an assigned veterinary practice. Regular equine and food animal farm calls. After-hours emergencies. Veterinary practice management.

## Large Animal Clinical Sciences—LCS

- 622 Advanced Equine Clinical Clerkship**  
Fall, Spring, Summer. 3 credits. P: LCS 616 or concurrently RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Advanced general training in equine medicine and surgery.
- 623 Equine Musculoskeletal Diseases Clerkship**  
Fall, Spring, Summer. 3 credits. P: (LCS 616 or concurrently) and (LCS 622 or LCS 615) RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Techniques and procedures used for the diagnosis and management of equine musculoskeletal diseases. Hospital and field cases.
- 624 Equine Theriogenology Clerkship**  
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Diagnostic methods used in equine reproduction.
- 625 Equine Primary Care Clerkship**  
Fall, Spring. 3 credits. A student may earn a maximum of 0 credits This course is not reenrollable RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Establishment and maintenance of equine herd health programs. Reproduction, parasite control, immunization, and diagnostic medicine and surgery in the field.
- 626 Advanced Equine Surgery Clerkship**  
Fall, Spring, Summer. 3 credits. P: LCS 616 or concurrently RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Advanced, in-depth training in overall surgical management of equine surgical patients. Breeds used for racing or sport.
- 627 Advanced Equine Medicine Clerkship**  
Spring. 3 credits. P: LCS 616 or concurrently RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Advanced, in-depth training in the medical management of equine patients. Emphasis on neonates.
- 628 Techniques in Equine Anesthesia and Surgery**  
Fall, Spring, Summer. 3 credits. P: (LCS 616 and LCS 622) or LCS 615 RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Advanced equine anesthesia and surgery. Preoperative care of University-owned equids, induction of anesthesia, and performance of minor surgical procedures.
- 631 Food Animal Practice Clerkship**  
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Supervised, off-campus experience in an assigned veterinary practice. Regular food animal farm calls. After-hours emergencies. Veterinary practice management.
- 632 Advanced Food Animal Medicine and Surgery Clerkship**  
Fall, Spring, Summer. 3 credits. P: LCS 616 or concurrently RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Principles of diagnostic treatment and prevention of diseases in food animals. Self-directed and in-depth on-farm experience.
- 635 Swine Production Medicine Clerkship**  
Fall. 3 credits. RB: Completion of year 2 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Swine production medicine and herd problem-solving topics. Participation in the swine medicine clinical course at Iowa State University. Field trips required.
- 638 Beef Production Medicine Clerkship**  
Fall. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.  
Veterinary management of production and health of beef cattle. Optional visits to out-of-state facilities may be offered.
- 639 Small Ruminant Medicine and Management Clerkship**  
Spring, Summer. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.  
Health care to small ruminants on an individual and flock or herd basis. Emphasis on sheep.
- 640 Large Animal Anesthesia Clerkship**  
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. A student may earn a maximum of 0 credits 6 credits RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Concepts and supervised practice in large animal anesthesiology.
- 641 Food Animal Theriogenology Clerkship**  
Summer. 3(3-0) P: LCS 679 RB: Completion of Semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Techniques for evaluating the reproductive performance of individual food animals and populations, primarily on cattle, but other species including swine and small ruminants.
- 646 Equine Neonatal Medicine Clerkship**  
Summer. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Principles of breeding farm management. Diagnosis and treatment of equine neonatal disorders. Supervised, in-clinic experience. Elective clerkship.
- 647 Concepts of Agricultural Practice Clerkship**  
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.  
Fundamentals of animal agriculture practice and food systems. Etiology, diagnosis, and prevention of common food animal diseases.
- 660 Wildlife Disease Ecology and Management**  
Fall, Spring. 3 credits. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Principles of investigations and management of pathogens at the wildlife, livestock, and human interface. Multidisciplinary teamwork skill and communication, research, management of emerging and re-surgent wildlife-borne diseases.
- 677 Veterinary Preceptorship**  
Fall, Spring, Summer. 3 credits. RB: (LCS 620 or LCS 621 or LCS 630 or LCS 631) or Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Applied large animal clinical science in private practices. Supervised off-campus experience.
- 678 Government and Corporate Veterinary Practice**  
Spring. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
Government veterinary practice issues including state, federal and international regulatory medicine, state and federal public health, state and federal wildlife, military veterinary medicine, food safety, and animal control. Study of corporate veterinary practice pertaining to the pharmaceutical and chemical industries.

- 679 Food Animal Production Medicine I**  
 Spring. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine R: Open to graduate-professional students in the College of Veterinary Medicine.  
 Entry-level principles of production medicine as applied to food animal practice.
- 682 Food Animal Production Medicine II**  
 Fall, Spring, Summer. 3 credits. P: LCS 679 or concurrently RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
 Farm evaluations and group problem-solving. Application and further development of skills and concepts learned in LCS 679.
- 685 Ruminant Health Problem Solving Clerkship**  
 Spring. 3 credits. P: LCS 682 or concurrently RB: Completion of semester 5 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
 The North American dairy industry and the role of veterinarians in health management programs on large versus small dairy herds. Students are required to spend one week at the University of Guelph.
- 690 Veterinary Public Health Field Experience Clerkship**  
 Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine or approval of department.  
 Advanced public health training with individualized problems and training objectives at off campus locations.
- 691 Veterinary Public Health Research Clerkship**  
 Fall, Spring, Summer. 3(3-0) RB: Completion of semester 5 of the graduate professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.  
 Advanced public health research. Individualized problems and training objectives.
- 809 Special Problems in Large Animal Surgery**  
 Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to graduate students in the Large Animal Clinical Sciences major. Approval of department.  
 Elective work in surgical research problems student's interest.
- 811 Special Problems in Large Animal Medicine**  
 Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to graduate students in the Department of Large Animal Clinical Sciences. Approval of department.  
 Elective work in medicine-related research problems.
- 813 Seminar**  
 Fall, Spring. 1(1-0) A student may earn a maximum of 4 credits in all enrollments for this course. R: Open to graduate students in the College of Veterinary Medicine.  
 Presentation and discussion of current topics in large animal clinical sciences by departmental graduate students, faculty, or outside speakers.
- 821 Conservation Medicine**  
 Fall of even years. 3(3-0) Interdepartmental with Fisheries and Wildlife. Administered by Fisheries and Wildlife. RB: Prior course work in vertebrate ecology, epidemiology and/or animal disease management. R: Open to graduate students or approval of department. SA: FW 823  
 Ecological and epidemiological principles of wildlife disease impacts and management. Critical review of selected case studies.
- 829 Design and Conduct of Epidemiological Studies and Clinical Trials**  
 Spring. 3(2-2) Interdepartmental with Epidemiology. Administered by Large Animal Clinical Sciences. P: (VM 533 or EPI 810) and (EPI 808 or EPI 808B)  
 Applied analytical methods in experimental design. Assessment of health and disease status of animal and human populations. Risk assessment and interpretation of clinical trials.
- 840 Advanced Equine Internal Medicine Topics I**  
 Spring. 2(2-0) R: Approval of department.  
 Body system approach to disease with emphasis on physiology and pathophysiology of the respiratory, cardiovascular, musculoskeletal and nervous systems.
- 841 Advanced Equine Internal Medicine Topics II**  
 Fall, Spring. 2(2-0) R: Approval of department.  
 Body system approach to disease with emphasis on physiology and pathophysiology of the gastrointestinal, urinary, hematopoietic, and endocrine systems.
- 863 Wildlife Disease Ecology**  
 Spring of even years. 3(3-0) Interdepartmental with Fisheries and Wildlife and Integrative Biology. Administered by Fisheries and Wildlife. RB: Additional course work in ecology, zoology, microbiology and environmental sciences. R: Open to graduate students. Not open to students with credit in FW 463.  
 Role of wildlife disease in ecological interactions, factors underlying pathogen emergence, mathematical modeling of infectious diseases, conservation medicine.
- 899 Master's Thesis Research**  
 Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 18 credits in all enrollments for this course. R: Open only to graduate students in the Department of Large Animal Clinical Sciences.  
 Master's thesis research.
- 999 Doctoral Dissertation Research**  
 Fall, Spring, Summer. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open only to doctoral students in the Department of Large Animal Clinical Sciences.  
 Doctoral dissertation research.