

## DEPARTMENT OF ANIMAL AND VETERINARY SCIENCES

<http://asci.uvm.edu/>

Domestic animals play a major role in our lives through agriculture, recreation, biomedical sciences, and companionship. The mission of the Department of Animal and Veterinary Sciences is to provide a high quality, broad-based education emphasizing domestic animals and their interactions with humans.

Graduates enter veterinary or other professional schools, pursue careers in biomedical sciences, agribusiness, companion animal and equine care and management, zoos and aquaria, or education. Students work closely with faculty advisors to tailor their programs toward specific career goals.

The Department of Animal and Veterinary Sciences actively encourages participation in undergraduate research, internships, and study abroad. Students have the opportunity to develop a well-rounded curriculum by complementing their classroom learning with laboratory and hands-on practical experiences.

### MAJORS

#### ANIMAL AND VETERINARY SCIENCES MAJOR

Animal Science B.S. (<http://catalogue.uvm.edu/undergraduate/agricultureandlifesciences/animalscience/animalsciencebs/>)

### MINORS

#### ANIMAL AND VETERINARY SCIENCES MINOR

Animal Science (<http://catalogue.uvm.edu/undergraduate/agricultureandlifesciences/animalscience/animalscienceminor/>)

### GRADUATE

Animal Biosciences M.S.

Animal Biosciences Ph.D.

Cellular, Molecular, and Biomedical Sciences Ph.D.

See the online Graduate Catalogue (<http://catalogue.uvm.edu/graduate/>) for more information

### Courses

#### ASCI 001. Introductory Animal Sciences. 0 or 3 Credits.

An overview of the genetics, nutrition, reproduction, and management of livestock and recreation species; introduction to animal behavior, animal disease, and biotechnology. Prerequisite: Animal Science major or Instructor permission.

#### ASCI 005. Intro to the Horse. 3 Credits.

Starting with evolution and domestication and progressing to current breeds, colors, uses, health, and management of horses, students gain a basic understanding of one of our most beloved domestic animals. No prior horse experience or knowledge is required.

#### ASCI 006. Companion Animal Care & Mgmt. 3 Credits.

Scientific principles of nutrition, breeding selection, health, management practices, pet therapy, and animal bonding. Primary emphasis on cat and dog.

#### ASCI 007. ABCs of Biosecurity. 3 Credits.

Covers the acronyms of relevant agencies, organizations, and preparedness strategies for agrosecurity, biosecurity, and communication to protect food and agriculture from disaster. Introduces food and agriculture threats, vulnerabilities, and disease disaster mitigation strategies.

#### ASCI 021. Horse Barn Cooperative. 1 Credit.

Develops skills in the practical aspects of equine management of individual horses and horses maintained in a group setting using hands-on experiences and peer teaching. Students care for their own horse or an Animal Science horse. Prerequisites: For students currently accepted into the UVM Horse Barn Cooperative Program or currently enrolled in ASCI 121; Instructor permission.

#### ASCI 030. Beginner Horseback Riding. 1 Credit.

Instruction in the basics of balanced seat horseback riding, including both ground skills (grooming, tacking and untacking) and mounted skills (mounting, dismounting, walking, trotting, cantering). Emphasizes safety and control.

#### ASCI 038. Understanding & Speaking Dog. 3 Credits.

With dogs as a model, explores the impact of genetic modification and selection, neonatal to adult development of the brain, the science of how the brain learns, human involvement and its impact, and the factual language of dogs. Prerequisite: Animal Science major or minor, Psychological Science major.

#### ASCI 043. Intro to Animal Nutrition. 3 Credits.

Comprehensive study of specific nutrients in terms of their digestion, availability, function, and utilization in animals. Prerequisite: ASCI 001 or BIOL 001 or BCOR 011.

#### ASCI 079. SU: One Health: an Exploration. 3 Credits.

Explores the interconnection of human, animal, and environmental health, covering topics like pollution, zoonoses, and comparative medicine. Examines the science behind these issues and what can be done about them and the role of other factors such as economics, culture, and the skills needed to tackle them.

#### ASCI 092. Independent Study. 1-18 Credits.

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

#### ASCI 095. Internship. 1-3 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

#### ASCI 097. Introductory Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

**ASCI 098. Introductory Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**ASCI 108. Equine Enterprise Management. 3 Credits.**

Provides guidelines for understanding risks, liabilities and other pertinent topics necessary for running a successful equine-related business. Prerequisite: ASCI 001 or ASCI 005.

**ASCI 110. Animal Nutrit, Metab & Feeding. 0 or 4 Credits.**

Principles of meeting the nutrient requirements of animals, especially as they relate to the practical problems of formulation and production systems. Prerequisite: Minimum Sophomore standing.

**ASCI 111. Animal Anatomy. 0 or 4 Credits.**

A comprehensive study of anatomical structure of vertebrate animals with emphasis on domestic animals. Taught from a systemic anatomy approach and incorporating microscopic and developmental anatomy, comparative vertebrate anatomy, and applied/clinical anatomy. Some physiology will be introduced to reinforce the link between structure and function. Prerequisites: BIOL 001 or BCOR 011 or BCOR 021; CHEM 023 or CHEM 031; or Instructor permission.

**ASCI 117. Horse Health and Disease. 3 Credits.**

After an introduction to equine anatomy and physiology, students are presented with common diseases and their corresponding description, cause, clinical signs, diagnosis, treatment, prognosis and prevention. Weekly small-group case studies highlight core principles. Optional hands-on opportunities at UVM Horse Barn. Prerequisite: ASCI 001 or ASCI 005.

**ASCI 118. Appl Animal Health. 0 or 3 Credits.**

A study of small and large domestic animal diseases. Natural response to disease, methods of diagnosis, control, and treatment. Prerequisite: ASCI 001, a Biology course, or Instructor permission.

**ASCI 119. Equine Training Techniques. 0 or 3 Credits.**

Behavior modification and training of the young horse under saddle and in the cart. Introduction to interdisciplinary directions open to the equine athlete and to conditioning programs associated with these options. Prerequisite: ASCI 001 or ASCI 005.

**ASCI 120. General Physiology. 3 Credits.**

A comprehensive review of the physiology of mammalian animals. Prerequisites: ASCI 111 or ANPS 019 and ANPS 020; BIOL 001, BCOR 011, or BCOR 021.

**ASCI 121. Equus. 2-4 Credits.**

A hands-on equine management experience. Students perform horse duties, recordkeeping, and make financial and management decisions on a horse boarding operation. Prerequisites: ASCI 001 or ASCI 005.

**ASCI 122. Animals in Soc/Animal Welfare. 3 Credits.**

Designed to heighten awareness and understanding of human-animal relationships in society, agriculture, and science. Prerequisites: Animal Science major; Sophomore standing.

**ASCI 125. Equine Instructing Techniques. 0 or 2 Credits.**

Examines philosophies, concepts and teaching-learning strategies needed for the development of sound equine instructing skills. Students gain hands-on horseback riding teaching experience during the second half of the semester in a supported environment. Prerequisite: ASCI 001 or ASCI 005.

**ASCI 129. Horse Barn Coop Exec Committee. 1 Credit.**

Student leaders, chosen by their Horse Barn Cooperative peers and Horse Barn Faculty Advisor(s), oversee the management of the UVM Horse Barn, including facilities, schedule, events, horse care, and student responsibilities. Students are supported by the Horse Barn Faculty Advisor(s). Prerequisites: ASCI 021 and Instructor permission.

**ASCI 130. Intermediate Horseback Riding. 1 Credit.**

Students gain further experience with balanced seat horseback riding, including ground skills (grooming, tacking and untacking) and mounted skills (walking, trotting and cantering). Emphasizes safety and control. Prerequisites: Instructor permission. Student should be able to walk, trot and canter off the lunge line.

**ASCI 134. CREAM. 4 Credits.**

A two-semester course in which students perform the work and make the financial and management decisions associated with the CREAM dairy herd. Prerequisites: Sophomore standing; Instructor permission.

**ASCI 135. CREAM. 4 Credits.**

A two-semester course in which students perform the work and make the financial and management decisions associated with the CREAM dairy herd. Prerequisites: Sophomore standing; Instructor permission.

**ASCI 141. Anat&Physiol Domestic Animals. 0 or 4 Credits.**

A comprehensive review of the structure and function of domestic animals, emphasizing those of economic importance. Differences between mammalian and avian species are discussed. Prerequisite: ASCI 001, BIOL 001, or BCOR 011. BIOL 002 or BCOR 012 recommended.

**ASCI 143. Forage and Pasture Mgmt. 4 Credits.**

Forage crops and grasslands play a central role in sustainable and diversified agriculture. Covers the scientific principles and practical applications of the production, management, and utilization of perennial and annual forage crops used by livestock and equine. Pre/co-requisite: BIOL 001 or BIOL 002 or BCOR 011 or BCOR 012 or PBIO 004 or PBIO 006 or Instructor permission. Cross-listed with: PSS 143.

**ASCI 147. SU:Wildlife Hlth & Consvration. 3 Credits.**

Explores wildlife health in the context of conservation. How is health defined? How does it relate to conservation at the population/species level? What are major threats to wildlife health? What tools can be used to understand, detect, and manage it? What ethical issues arise? What might a career in this field look like? Prerequisites: BCOR 011 and BCOR 012; or BIOL 001 and BIOL 002; or BCOR 021.

**ASCI 154. Canine Behavior. 3 Credits.**

Identify, assess and treat/manage canine behavior issues. Learn bite prevention, interviewing and communication skills. Formulate and implement treatment plan or alternative options. Analyze efficacy of plan. Theoretical hands-on practice. Prerequisite: ASCI 038.

**ASCI 156. Dairy Management Seminar. 2 Credits.**

Seminar course addresses research, policy, and production topics in the dairy industry and develops leadership roles through guest speakers, field trips, and group projects. Prerequisites: Minimum Junior standing or with Instructor permission any student interested in dairy industry.

**ASCI 168. Animal Genetics. 3 Credits.**

The study of DNA with an emphasis in genetics of animal species, included but not limited to livestock and companion animals. Topics include patterns of inheritance, molecular genetics, gene regulation, biotechnology, genomics, population and quantitative genetics. Prerequisite: BIOL 001 or BIOL 002 or BCOR 011 or BCOR 012 or BCOR 021.

**ASCI 171. Zoos, Exotics & Endang Species. 3 Credits.**

From gorillas to golden lion tamarinds, how human attitudes, activities, utilization, and management strategies impact wild and captive animal populations. Prerequisite: ASCI 001 or BIOL 001 or BIOL 002 or BCOR 011 or BCOR 012.

**ASCI 181. Animal Science Career Seminar. 1 Credit.**

Discussion and workshop activities exploring careers in animal and food science. Includes resume preparation and interview training. Prerequisite: Animal Science major.

**ASCI 187. Intro to Biochemistry: Lab. 1 Credit.**

Introduction to techniques used to explore fundamental biochemistry concepts including enzyme kinetics, lipids, carbohydrate chemistry, and gene expression. Includes spectrophotometry, gel electrophoresis, and mass spectrometry. Pre-Co-requisites: PBIO 185, BIOC 201, or NFS 183. Cross-listed with: NFS 187.

**ASCI 191. Intermediate Special Topics. 0.5-15 Credits.**

See Schedule of Courses for specific titles.

**ASCI 192. Intermediate Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**ASCI 193. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ASCI 194. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**ASCI 195. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion. Prerequisite: Instructor permission.

**ASCI 198. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Prerequisites: Junior standing; Department Chair permission.

**ASCI 208. Equine Industry Issues. 3 Credits.**

Case-based course enhances students' abilities to integrate information, use logical thought processes, and produce concise, organized solutions to real problems, from individual horses to industry-wide. Prerequisite: ASCI 108 or ASCI 121 or ASCI 122.

**ASCI 215. Physiology of Reproduction. 3 Credits.**

Fundamental principles of the physiology of reproduction with emphasis on, but not limited to, farm animals. Prerequisite: ASCI 111 and ASCI 120; or ASCI 141; or Instructor permission.

**ASCI 216. Endocrinology. 3 Credits.**

Physiology of endocrine and autocrine/paracrine systems and growth factors. Prerequisites: BIOL 001, BCOR 011, or BCOR 021; ASCI 120, ASCI 141, or Instructor permission.

**ASCI 217. Topics in Applied Reproduction. 1 Credit.**

Laboratory for fundamental principles of the physiology of reproduction with emphasis on, but not limited to, farm animals. Must be taken concurrently with ASCI 215. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisites: ASCI 111 and ASCI 120; or ASCI 141; or Instructor permission. Co-requisite: ASCI 215.

**ASCI 220. Lactation Physiology. 3 Credits.**

Physiological mechanisms that control and affect lactation in domestic and laboratory animals with emphasis on dairy cattle. Includes mammary anatomy, development and health, and milk synthesis. Prerequisite: CHEM 023 or CHEM 031; and ASCI 141 or both ASCI 111 and ASCI 120.

**ASCI 221. Lameness in Horses. 0 or 4 Credits.**

Focuses on normal equine anatomy related to movement and what happens when horses are injured. Students learn common causes of lameness, as well as how to diagnose, treat, and prevent those causes. Labs are hands-on with horses. Prerequisites: ASCI 117.

**ASCI 225. Equus Advising. 1-6 Credits.**

Students are responsible for overseeing the care and health of the 6 Animal Science teaching horses. In addition, these students schedule and teach riding lessons, provide instruction during class time, oversee and coordinate the completion of weekly chores, and share important information between Coop and Equus. Prerequisites: ASCI 108, ASCI 117, ASCI 121, ASCI 125 or Instructor permission.



**ASCI 234. Advanced Dairy Management. 15 Credits.**

An intensive, residential program at the Miner Institute providing an in-depth experiential program in the management of the dairy herd. Prerequisite: Junior standing or Farms 2+2 enrollment.

**ASCI 235. CREAM Advising. 4 Credits.**

Augments learning acquired during previous CREAM experience; students provide technical, logistical, organizational support to the current group of CREAM students. Prerequisite: ASCI 134 or ASCI 135.

**ASCI 242. Advanced Animal Nutrition. 0 or 4 Credits.**

Discusses the principles of meeting the nutrient requirements of animals, including an introduction to feedstuffs, animal metabolism and feed formulation for domestic or captive vertebrate animals. Prerequisites: ASCI 043 and ASCI 111 or Instructor permission. Pre/Co-requisite: ASCI 120.

**ASCI 263. Clin Top: Companion Animal Med. 3 Credits.**

Case studies in companion animal medicine are used to develop clinical, analytical, and diagnostic skills based on a knowledge of anatomy and physiology. This course also explores problem-based learning in medicine. Prerequisites: ASCI 118; and ASCI 141 or both ASCI 111 and ASCI 120; minimum Junior standing.

**ASCI 264. Clin Topics: Livestock Medicine. 3 Credits.**

An advanced study of diseases in cattle, sheep, goats, and pigs, emphasizing disease detection, pathobiology, treatment and prevention. Prerequisites: ASCI 118; ASCI 141 or both ASCI 111 and ASCI 120.

**ASCI 265. Clin Topics Equine Med & Surg. 3 Credits.**

Students work through medical and surgical cases from chief complaint to treatment, prognosis and prevention. Diagnostic techniques and treatment options prioritized. Hands-on opportunities include physical, orthopedic, and neurologic exams, as well as field trips to local equine facilities and the UVM Morgan Horse Farm. Prerequisite: ASCI 117.

**ASCI 272. Adv Top: Zoo, Exotic, Endang Spec. 3 Credits.**

An exploration of modern zoo philosophy and ethics and the extent of human intervention necessary for the preservation of endangered species. Prerequisites: ASCI 171 and Instructor permission.

**ASCI 277. Animal and Human Parasitology. 3 Credits.**

Emphasizes the morphology, life cycles, and pathogenesis of representative taxa from the parasitic protozoa, helminthes, and arthropods of humans and domestic animals. Prerequisite: BIOL 001 or BIOL 002 or BCOR 011 or BCOR 012 or BCOR 021; and ASCI 117 or ASCI 118 or another 100 level ASCI course; or Instructor permission.

**ASCI 278. Molecular Epidemiol Infect Dis. 3 Credits.**

Provides a foundation of knowledge on the use of molecular biology tools to study infectious disease problems; explores how biologists and health scientists link epidemiological methods and molecular biology techniques to address global health issues. Prerequisites: Minimum Junior standing, one 100-level course in BioCore, Biology, Health, Health Sciences, or Microbiology and Molecular Genetics or ASCI 118 or ASCI 177 or Graduate student standing or Instructor permission.

**ASCI 279. One Health: Antimicrob Resist. 3 Credits.**

Provides a foundation of knowledge on the problem of antimicrobial resistance and factors that contribute to the emergence and spread of resistant micro-organisms. Considers antimicrobial resistance from a One Health perspective, integrating animal, environmental and human health. Prerequisites: Minimum Junior standing, one 100-level course in BioCore, Biology, Health, Health Sciences, or Microbiology and Molecular Genetics or ASCI 118 or ASCI 177 or Graduate student standing or Instructor permission.

**ASCI 293. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ASCI 294. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**ASCI 295. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**ASCI 296. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ASCI 297. Advanced Special Topics. 1-18 Credits.**

Written courses, seminars or topics beyond the scope of existing offerings. See Schedule of Courses for specific titles. Prerequisite: Department Chair permission. May enroll more than once for maximum of fifteen hours.

**ASCI 298. Advanced Special Topics. 1-18 Credits.**

Written courses, seminars or topics beyond the scope of existing offerings. See Schedule of Courses for specific titles. Prerequisite: Department Chair permission. May enroll more than once for maximum of fifteen hours.