

# ANSC - ANIMAL SCIENCES

ANSC Class Schedule (<https://courses.illinois.edu/schedule/DEFAULT/DEFAULT/ANSC/>)

## Courses

**ANSC 100 Intro to Animal Sciences credit: 4 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/100/>)

[IAI Code: AG902] Survey of beef and dairy cattle, companion animals, horses, poultry, sheep, and swine. Includes the importance of product technology and the basic principles of nutrition, genetics, physiology, and behavior as they apply to breeding, selection, feeding, and management. Lecture and lab.

**ANSC 101 Contemporary Animal Issues credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/101/>)

Provides an understanding of fundamental issues impacting the care and use of animals, and their role in human welfare. Topics addressed include the fundamental principles of animal domestication and its impact on humans, animal welfare and care, animal-environmental interactions, food safety, diet and health issues, economic and societal issues facing the world today, and bioethical issues.

**ANSC 103 Working With Farm Animals credit: 2 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/103/>)

Introductory course that will provide novice students with the fundamentals of animal-animal and animal-human interactions for domestic farm animals. Emphasizes hands-on experiences to develop a background in the concepts and practice of recognizing and understanding the animal's physiology and behavior, animal well being, and animal responses to human interactions. Prerequisite: ANSC 100. Restricted to students in the Animal Sciences department. Not intended for First Time Freshman students.

**ANSC 110 Animal Exploration: A Global Perspective credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/110/>)

Course explores the biological, cultural, ecological, historical, political, scientific and social aspects of animals and their impact on global agriculture, medicine and industry. The curriculum also addresses biological concepts, animal research, diseases, vaccinations, and a diverse range of species including amphibians, aquatic organisms, companion animals, livestock, primates, reptiles and safari animals. The course intends to cultivate critical thinking, ethical reasoning, scientific literacy, and an understanding of the important interconnection between humans and animals. Credit is not given toward graduation for Animal Science majors. Prerequisite: Not intended for Animal Science majors. This course satisfies the General Education Criteria for: Nat Sci Tech - Life Sciences

**ANSC 120 The Art and Ethics of Animal Documentaries credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/120/>)

With the rise of both social media and documentary films, animal welfare is mainly viewed through the lens of media. This course asks students to critically evaluate information from these pieces of media and better understand the narratives and biases that can be inherent in documentaries, nature films, undercover animal rights investigations, and social media accounts. We will also explore how these media can be used to bring awareness and education about animal industries.

This course satisfies the General Education Criteria for: Humanities - Lit Arts

**ANSC 198 Building Habits for Success in Animal Sciences credit: 2 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/198/>)

This introductory course for students in the Department of Animal Sciences is designed to help improve student achievement in the college classroom by building study habits, improving time management, building community inside and outside the classroom, and overall understanding and exploring the resources and academic environment at the University of Illinois.

**ANSC 199 Undergraduate Open Seminar credit: 0 to 5 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/199/>)

An experimental course on a special topic in animal sciences. Approved for Letter and S/U grading. May be repeated, if topics vary.

**ANSC 201 Principles of Dairy Production credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/201/>)

Surveys the dairy industry; examines principles of breeding, selection, reproduction, feeding, milking and management of dairy cattle. Prerequisite: ANSC 100.

**ANSC 205 World Animal Resources credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/205/>)

Examination of the world's animals, domesticated and wild, and their uses in various climatic, economic and cultural contexts. Exploration of their contemporary management and their future prospects. Provides background for international experiences, such as ACES 298 and ACES 299. Prerequisite: Completion of the campus Composition I general education requirement.

This course satisfies the General Education Criteria for: Advanced Composition

**ANSC 206 Horse Management credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/206/>)

Focus on the principles of managing horses from birth through breeding; topics include reproductive physiology, breeding management, nutrition, diseases, parasites, herd health programs, genetics, facility design and exercise physiology.

**ANSC 207 The Science of Pets and How to Care for Them credit: 3 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/207/>)

Provides students with the knowledge and skills necessary to care for animal species commonly kept as pets. Biological concepts of anatomy, genetics, evolution, nutrition, reproduction, and behavior will provide valuable insight into companion animal husbandry practices for dogs, cats, small mammals, birds, fish, reptiles, and amphibians. Credit is not given for both ANSC 207 and ANSC 307.

This course satisfies the General Education Criteria for: Nat Sci Tech - Life Sciences

**ANSC 210 Grilling and BBQ Science credit: 2 Hours.** (<https://courses.illinois.edu/schedule/terms/ANSC/210/>)

This course will focus on food preparation and safety, product quality, correct cooking methods, endpoint temperatures, and other general grilling-related topics. The objective is to expand student knowledge on how to utilize different cuts of meat and other products to produce meals. Students will work in groups to prepare a dish with a specific product assigned to them and present their results to the class. Grills and cooking equipment will be provided. Additional fees may apply. See Class Schedule.

**ANSC 211 Meat Animal Evaluation credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/211/>)**

This course provides training in the evaluation of market animals and carcasses for value, price, and performance ranking. Students will develop skills in assessing beef, pork, and lamb for key industry traits such as trimness, muscling, and quality. Instruction emphasizes both live animal and carcass evaluation, with applications to real-world marketing and decision-making scenarios. Field trips to farms, processing plants, and meat evaluation competitions are required, offering hands-on experience with current industry standards and practices. Instructor approval is required to enroll in the course.

**ANSC 215 Introduction to Animal Evaluation credit: 1 or 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/215/>)**

The objective of each section is to train students on industry evaluation techniques of animals and/or their by-products. Additionally, students will examine different industry production styles, selection for improvements, and end product marketability. This course is divided into sections that focus on evaluation of animals or animal by-products (meat or dairy) and will develop skills of basic evaluation associated with each section. Travel to production facilities may occur based on the section. For Animal Science majors, only one instance (2 credit hours) taken in this course will count as an Applied Science credit towards their degree requirements. May be repeated in separate semesters, if topics vary to a maximum of 6 credit hours.

**ANSC 221 Cells, Metabolism and Genetics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/221/>)**

Provides an introductory background in basic aspects of cell biology, physiology, and genetics. Topics addressed include cell structure, cell organelles, and different types of cells, protein synthesis and gene expression, chromosome structure, basic mechanisms of chromosome replication, basic principles of quantitative and population genetics, and an introduction to genomics and proteomics. Prerequisite: ANSC 100, CHEM 102 and 103 or concurrent enrollment.

**ANSC 222 Anatomy and Physiology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/222/>)**

Provides an introductory background in basic and fundamental principles of animal anatomy and physiology. The major organ systems (muscle, skeletal, neural, endocrine, cardiovascular, respiratory, and renal) will be presented with an emphasis on comparative anatomy, integrated function, and specific homeostatic mechanisms. Prerequisite: ANSC 100, CHEM 102 and 103 or concurrent enrollment.

**ANSC 223 Animal Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/223/>)**

Provides an introductory background in the fundamental principles of animal nutrition and how nutrition impacts animal well-being and performance. Students will develop comprehensive knowledge in gastrointestinal and digestive anatomy and physiology, nutrient function and requirements, and energy utilization in various species. Specific topics include different classes and properties of nutrients, differences in digestive mechanisms in monogastric vs. ruminant animals, and how carbohydrates, lipids, proteins, minerals, and vitamins contribute to the nutrient requirements of animals. Prerequisite: ANSC 100 and ANSC 221.

**ANSC 224 Animal Reproduction and Growth credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/224/>)**

Study of the basic principles of reproduction, lactation, growth, and hormonal regulation in animals as well as humans, including cell growth and differentiation, processes of reproduction, biotechnological methods of reproductive control, manipulation, performance enhancement of lactation and growth. Prerequisite: ANSC 100, ANSC 221.

**ANSC 250 Companion Animals in Society credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/250/>)**

Explores the current and historical functions and influences of companion animals in American society. Topics include the evolution of animal protection, the use of assistance and service animals, and the growth of the pet supply industry. Controversial issues which are of current concern to society will also be examined.

This course satisfies the General Education Criteria for: Cultural Studies - Western

**ANSC 251 Epidemics and Infectious Diseases credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/251/>)**

Introduces students to the major past and present causes of plague in humans as well as agricultural and companion animals. Smallpox, yellow fever, bubonic plague, polio, SARS, AIDS, West Nile encephalitis, Zika, PRRS, PEDV, foot and mouth disease, bovine spongiform encephalopathy, and others will be discussed. The characteristics of each disease, including, mode of transmission, symptoms, duration of illness, and mortality rates will be presented. History and probability of recurrence will also be explored. Prerequisite: Some knowledge in anatomy and physiology may be helpful.

**ANSC 255 Animal Ethics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/255/>)**

Explores ethical issues raised by human use of animals. Students will be asked to apply philosophical perspectives to historical and current animal issues such as raising animals for food production, the keeping of pets, management and use of wild animals, use of animals in research, animal breeding and biotechnology, and animal control.

This course satisfies the General Education Criteria for: Humanities - Hist Phil

**ANSC 256 Horse's Role in Human History credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/256/>)**

Provides an understanding of the crucial roles that horses have played in the development and expansion of human civilization, including how the role of the horse in culture and society has changed throughout history. Topics addressed include an understanding of the evolution and domestication of horses, use of horses for transportation, sport, warfare and power, and the impact of horses on societal issues facing the world today.

**ANSC 298 Animal Science Careers and Professional Development credit: 1 Hour. (<https://courses.illinois.edu/schedule/terms/ANSC/298/>)**

Designed to help students prepare for and investigate different career options in Animal Sciences. Professional development opportunities like undergraduate research, internships, and study abroad will be discussed. Prerequisite: Sophomore standing.

**ANSC 301 Food Animal Production, Management, and Evaluation credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/301/>)**

Provides an overview of how nutrition, genetics, and environment affect beef cattle, swine, and sheep growth, development, and end-product quality and value. Students get hands-on experience evaluating and determining value of live animals and carcasses. Prerequisite: Credit or concurrent enrollment in ANSC 223 and ANSC 224; or consent of instructor.

**ANSC 305 Human Animal Interactions credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/305/>)**

Animals play a significant role in our society and in the lives of many individuals. This course explores the current and historical interactions of humans with non-human animals in our society from a multidisciplinary approach. Various cultures and historical periods will be examined when discussing these relationships with various non-human animals.

This course satisfies the General Education Criteria for: Social Beh Sci - Soc Sci

**ANSC 306 Equine Science credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/306/>)**

Understand and apply current scientific research and principles of equine science to intensive horse production. An in-depth approach to equine reproductive physiology, nutrition, anatomy and exercise physiology will be followed using a combined lecture and laboratory format. Emphasis on current research and hands-on techniques. Prerequisite: ANSC 222 or equivalent, and credit or concurrent enrollment in ANSC 224 or equivalent.

**ANSC 307 Companion Animal Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/307/>)**

Provides an advanced overview of companion animal biology through consideration of the physical structure, nutrition, behavior, and reproduction of animal species most commonly kept as companions. Course content is applied to discussion of best management practices and basic preventive health care. Course content is largely focused on cats and dogs, although other mammals, birds and reptiles are briefly considered. Legal and economic issues, ethical considerations, and career opportunities associated with companion animals are also incorporated into course discussion. Credit is not given for both ANSC 307 and ANSC 207. Prerequisite: ANSC 221, ANSC 222, ANSC 223, ANSC 224 or consent of instructor.

**ANSC 309 Meat Production and Marketing credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/309/>)**

General approach to meat utilization with emphasis on selecting, grading, cutting, and pricing meat for the retail, restaurant, and food service industry. This course includes laboratory and may use field trips to establishments to highlight course concepts.

**ANSC 310 Meat Selection and Grading credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/310/>)**

Study characteristics associated with the value of carcasses, primal and retail cuts from meat animals; emphasize USDA grading and specifications as well as written communication. Field trips to meat packing plants are required. Prerequisite: ANSC 215, Section A.

**ANSC 312 Advanced Livestock Evaluation credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/312/>)**

Advanced instruction in the selection of breeding animals of beef, sheep, and swine species and in the evaluation of market animals for slaughter. This course requires visits to farms, related companies, and events to observe the latest techniques and scientific principles associated with livestock selection and evaluation. Prerequisite: ANSC 211 or consent of instructor.

**ANSC 313 Horse Appraisal credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/313/>)**

Advanced course for students interested in improving their performance and conformation evaluation skills; provides exposure to the horse show industry and the career opportunities associated with this facet of the horse industry.

**ANSC 314 Adv Dairy Cattle Evaluation credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/314/>)**

Advanced instruction in the selection of breeding dairy animals. Involves visits to farms, related companies and events to observe the latest techniques and scientific principles associated with dairy cattle selection and evaluation. Field trips for cattle judging are required. Prerequisite: ANSC 204 or ANSC 215 or consent of instructor.

**ANSC 322 Livestock Feeds and Feeding credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/322/>)**

Livestock feeds and practical feeding applications for livestock will be addressed. Feed identification and ration formulation will be strongly emphasized. One session of this class will take place at the UIUC Feed Mill. Prerequisite: ANSC 223.

**ANSC 350 Principles of Biochemistry in Animals credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/350/>)**

Comprehensive study of biomolecule structure/function and the metabolism of carbohydrates, lipids, proteins, nucleic acids, vitamins, and coenzymes, with emphasis on energy transformations and metabolic regulation in animals. Prerequisite: CHEM 232 or CHEM 236, or equivalent.

**ANSC 363 Behavior of Domestic Animals credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/363/>)**

Introduction to concepts of animal behavior with emphasis on domestic animals; lecture and discussion. Prerequisite: ANSC 100.

**ANSC 366 Animal Behavior credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/366/>)**

Same as ANTH 342, IB 329, and PSYC 329. See IB 329.

**ANSC 370 Companion Animal Policy credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/370/>)**

This course provides an overview of public policy with respect to the use and treatment of companion animals in the United States. Current and alternative policies are considered in terms of their effectiveness in improving or otherwise altering the treatment of companion animals. The influences of animal protection organizations, consumer groups, politicians, the scientific community, and other stakeholders on the development and enforcement of policies are examined in detail. Prerequisite: ANSC 250.

**ANSC 398 UG Experiential Learning credit: 1 to 5 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/398/>)**

Student-directed experiential learning on special topics directly pertaining to subject matter in animal sciences. Students are required to complete a Memorandum of Agreement prior to enrolling in this course. Additional fees may apply. See Class Schedule. Approved for Letter and S/U grading. May be repeated up to 5 hours per semester, up to a maximum of 12 total hours. Independent Study courses are limited to 12 hours total applying to a degree in ACES.

**ANSC 399 Undergraduate Special Topics credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/399/>)**

Exploration of specialized topics in Animal Sciences not covered in existing courses. Designed for advanced undergraduates seeking deeper engagement in emerging or experimental subject areas. May be repeated in the same term to a maximum of 6 hours if topics vary. May be repeated in separate terms to a maximum of 12 hours if topics vary.

**ANSC 400 Dairy Herd Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/400/>)**

The technology of modern milk production practices; application of principles in nutrition, physiology, economics, health and hygiene, waste management, and facilities design for efficient dairy herd management systems. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 201 or consent of instructor.

**ANSC 401 Beef Production credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/401/>)**

The principles of the management of beef cattle enterprises. Applies science and technology to the breeding, selection, feeding, health and production of beef and beef products. Emphasizes the use of research findings in decision-making. 3 undergraduate hours. 3 graduate hours. Credit is not given for both ANSC 401 and ANSC 213. Prerequisite: ANSC 223 or equivalent.

**ANSC 402 Sheep and Goat Production credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/402/>)**

The objective of this course is to understand the core principles of sheep and goat production. This course covers topics including common breeds, reproduction, breeding and selection, nutrition, health, fiber production, and management. Some lectures will be at the University farms. Other lectures will include demonstrations of sheep and goats evaluation principles, neonatal lamb and kid health, body condition scoring, and lamb and goat cooking. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 223 or equivalent.

**ANSC 403 Pork Production credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/403/>)**

Applies science and technology to the selection, breeding, feeding, housing and management of swine in a production enterprise; emphasizes use of research findings in decision making. 3 undergraduate hours. No graduate credit. Prerequisite: ANSC 223, ANSC 224, ANSC 431 or equivalents or consent of instructor.

**ANSC 404 Poultry Science credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/404/>)**

Basic principles of genetics, physiology, nutrition, and health of avian species; the application of science and technology in solving the breeding, nutrition, disease, housing, and other management problems encountered in commercial egg and poultry meat production. 3 undergraduate hours. 3 graduate hours.

**ANSC 406 Zoo Animal Conservation Sci credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/406/>)**

Topics related to the conservation, physiology and management of exotic animal species in a captive setting will be addressed. These include conservation biology, population genetics, nutrition, reproduction (natural and assisted), behavior, exhibitry, environmental enrichment and veterinary care. Also covers taxonomy, zoo research, the role of zoos in conservations, and the ethics of maintaining captive animals. 3 undergraduate hours. 3 graduate hours. One Saturday field trip may be required. Prerequisite: ANSC 221 or IB 104, or equivalent.

**ANSC 407 Animal Shelter Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/407/>)**

Basic management concepts related to maintaining the physical and behavioral health of companion animals in a shelter setting will be addressed. Population dynamics and management will be heavily emphasized. Utilizes practical resources available through local and national animal welfare organizations. Two class sessions will take place at the Champaign County Humane Society. One Saturday field trip is required. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 207 or ANSC 307.

**ANSC 409 Meat Science credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/409/>)**

Fundamental biological principles that influence composition, processing, preservation, and quality of meat and meat products. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 221, IB 100, or equivalent, and CHEM 102.

**ANSC 420 Ruminant Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/420/>)**

Physiology and microbiology of digestion in the ruminant, and biochemical pathways of utilization of the absorbed nutrients for productive purposes. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 223 or equivalent.

**ANSC 421 Minerals and Vitamins credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/421/>)**

Nutritional implications and metabolic roles of minerals and vitamins in animal metabolism. The course is designed to instill a basic understanding of vitamin and mineral functions, absorption, metabolism, and excretion. Research methodologies used in the study of vitamin and mineral nutrition will also be discussed. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 223 or equivalent, credit or concurrent registration in MCB 450 or ANSC 350, or consent of instructor.

**ANSC 422 Companion Animal Nutrition credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/422/>)**

Digestive physiology and basic nutritional considerations of companion animals, with primary focus on dogs and cats. Topics discussed include nutritional idiosyncrasies of dogs and cats, the importance of nutrition in various physiological states, and nutrient needs during disease. Information on pet food regulations, common ingredients and formulation, manufacturing methods, and trends in the pet food industry will also be covered. Same as NUTR 422. 4 undergraduate hours. 4 graduate hours. Prerequisite: ANSC 223 or equivalent.

**ANSC 424 Pet Food & Feed Manufacturing credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/424/>)**

Integrates principles of animal nutrition with various aspects pertaining to pet food and animal feed manufacturing. Topics discussed in this course include processing technologies (e.g., extrusion, retorting, baking) involved in the manufacturing of pet foods and animal feeds, principles of diet formulation and nutritional guidelines, and an overview of regulatory affairs, quality control, and good manufacturing practices. This course includes two field trips to a pet food manufacturing facility and a food and feed ingredient company. Same as NUTR 424. 3 undergraduate hours. 3 graduate hours. Prerequisite: Required - ANSC 223; Recommended - ANSC 322 and ANSC 422.

**ANSC 431 Advanced Reproductive Biology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/431/>)**

Course is an upper-level undergraduate or entry-level graduate course dealing with reproductive biology. It will include the study of basic cell biology of reproduction, lactation, growth and hormone regulation of domestic and non-domestic animals as well as humans, including biotechnology methods of reproduction control, manipulation, performance enhancement of lactation and growth, and disease control. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 224 or equivalent.

**ANSC 435 Milk Quality and Udder Health credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/435/>)**

An advanced course on the physiological basis of mammary growth, milk secretion, and udder health. Topics covered includes mammary gland anatomy, hormonal control, causes and control of mastitis, milk harvesting, and milk quality. 2 undergraduate hours. 2 graduate hours. Prerequisite: ANSC 221 or a comparable Genetics course.

**ANSC 438 Lactation Biology credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/438/>)**

Examines the structural and functional development of the mammary gland, cell biology, and control of milk synthesis, and composition and biochemistry of milk. Compares and analyzes the physiological processes of lactation in mammals. 4 undergraduate hours. 4 graduate hours. Prerequisite: ANSC 224 or equivalent.

**ANSC 440 Applied Statistical Methods I credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/440/>)**

Same as CPSC 440, FSHN 440, NRES 440, and NUTR 440. See CPSC 440.

**ANSC 441 Human Genetics credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/441/>)**

Same as ANTH 441. See ANTH 441.

**ANSC 442 Introduction to Data Analytics credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/442/>)**

Introduces students to standard approaches commonly used to analyze science and engineering data; to the strengths and limitations of the approaches; and to gain confidence in the interpretation of results. At the end of this course, students will be able to analyze a wide range of datasets using appropriate models, and draw robust conclusions. 2 undergraduate hours. 2 graduate hours. Credit is not given for ANSC 442 and ANSC 445.

**ANSC 444 Applied Animal Genetics credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/444/>)**

Principles of heredity and their application to the problems of animal improvement. 3 undergraduate hours. 3 graduate hours.

**ANSC 445 Statistical Methods credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/445/>)**

Design and analysis of experiments: multiple regression, method of fitting constants, factorial experiments with unequal subclass numbers, analysis of covariance, experimental design; computer applications to agricultural experiments using statistical packages. Same as ABE 445 and NRES 445. 4 undergraduate hours. 4 graduate hours. Prerequisite: CPSC 440, or equivalent.

**ANSC 446 Population Genetics credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/446/>)**

Conceptual and mathematical approach to the genetics of populations: estimation of allele and genotype frequencies; Hardy-Weinberg principle; measures of genetic diversity and distance; selection; non-random mating; genetic drift; mutation; neutral theory; migration and population subdivision; linkage and recombination; coalescence and phylogenetic inference. Applications to animals, plants, human health and wildlife conservation. Same as IB 416. 3 or 4 undergraduate hours. 3 or 4 graduate hours. Students desiring 4 hours credit do additional work in some area of population genetics. Prerequisite: An introductory genetics course (ANSC 221 or IB 204); one of MATH 220, MATH 221, or MATH 234; or consent of instructor.

**ANSC 449 Biological Modeling credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/449/>)**

Same as CPSC 448, GGIS 468, and IB 491. See GGIS 468.

**ANSC 450 Comparative Immunobiology credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/450/>)**

Advanced concepts of immunophysiology and immunogenetics. Immunophysiology with an emphasis on immune-neuroendocrine interactions. The molecular and cellular basis of self-nonself recognition with an emphasis on the major histocompatibility complex in vertebrates and innate immunity in both vertebrates and invertebrates. The mucosal immune system, which requires a complex interplay between innate and acquired immunity to protect mucosal surfaces exposed to the environment. A working knowledge of genetics and cellular and molecular biology is recommended. Same as MCB 442 and PATH 410. 4 undergraduate hours. 4 graduate hours.

**ANSC 451 Microbes and the Anim Indust credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/451/>)**

Fundamental aspects of the ecology of microorganisms and their biochemical activities related to the degradation of organic matter with emphasis on the gastrointestinal tract of production animals. 3 undergraduate hours. 3 graduate hours. Prerequisite: MCB 100, and ANSC 350, MCB 300, MCB 424, or equivalent.

**ANSC 452 Animal Growth and Development credit: 3 or 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/452/>)**

Basic principles of animal growth from early fetal development through typical marketing ages for the major domestic animal species. Topics discussed include molecular and cellular determinants of tissue development and whole animal growth, with coverage of current and future technologies for manipulating growth to enhance animal production. 3 or 4 undergraduate hours. 4 graduate hours. Prerequisite: ANSC 221, ANSC 222, ANSC 223, and ANSC 224.

**ANSC 454 Neuroimmunology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/454/>)**

Provides current information about the fundamental structures and functions of the 'neuroimmune' system. Later sessions address applied and contemporary neuroimmunology through research-focused lectures paired with 'journal club-style' discussions of recent, transformative publications. A working knowledge of basic immunology, anatomy, physiology, and cell and molecular biology is recommended. Same as NEUR 454. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 221, ANSC 222, ANSC 450 or equivalents.

**ANSC 464 Physiology of Animal Stress & Disease credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/464/>)**

Advanced interdisciplinary concepts of animal physiology and behavior during stress and disease. Lectures and discussions will cover multi-system interactions regulating immune, microbial, endocrine, and behavioral responses to external stressors, pathogen infection, and idiopathic disease. Topics include: neuroendocrine regulation of immunophysiology and behavior, pathogenic and behavioral response to disease, bidirectional communication between the microbiome and central nervous system, developmental disruptions during gestation, cancer biology, and metabolic diseases. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 221 or equivalent, and ANSC 222 or equivalent; or consent of instructor.

**ANSC 467 Applied Animal Ecology credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/467/>)**

An in-depth multidisciplinary approach (physiology, behavior, immunology, neuroscience) to understanding animal-environment interactions (including thermal, air, microbic, photic and behavioral factors) as basis for prescribing practical environments for keeping animals. Courses in physiology, biology, nutrition, microbiology, and genetics are recommended. 3 undergraduate hours. 3 graduate hours. Prerequisite: ANSC 221 or equivalent, ANSC 222 or equivalent, and ANSC 223 or equivalent; or consent of instructor.

**ANSC 470 Companion Animal Cruelty Investigations credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/470/>)**

Animal cruelty is an unfortunate reality across the country and around the world. Proper investigation and prosecution of these cases is crucial to the prevention of these acts in the future. This course will teach the concepts and processes of animal cruelty investigations and prosecution, largely focusing on companion animals. 2 undergraduate hours. 2 graduate hours. Prerequisite: ANSC 250 and ANSC 407.

**ANSC 471 ANSC Leaders & Entrepreneurs credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/471/>)**

Designed to familiarize students with the tools and skills necessary for successful business operation in industry and entrepreneurial environments including food animal production farms. The overall aim is to explore how enhanced interpersonal and leadership skills facilitate positive relations in business. Students will design a business plan, an entrepreneurial enterprise, that will be read by an external committee of professors, community members, and business owners and evaluated for its viability and creativity. This course is relevant for leaders as well as future entrepreneurs interested in acquiring valuable skills that may be applied to many careers. 3 undergraduate hours. 3 graduate hours. Prerequisites: Any advanced composition course.

**ANSC 480 Introduction to Coding and Precision Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/480/>)**

Overview of agricultural systems' problems and application of different tools and sensors on problem-solving and efficient systems' design. The course will introduce coding and precision technologies through a hands-on approach. 3 undergraduate hours. 3 graduate hours. Credit is not given toward graduation for ANSC 360 and ANSC 480. Prerequisite: Three years of high school mathematics, or MATH 112, or consent of instructor.

**ANSC 498 Integrating Animal Sciences credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/498/>)**

Introduction to the theoretical basis of and skills associated with leadership, inquiry, and collaborative learning. Capstone experience in integrating knowledge, practicing skills, and applying theory through collaborative projects that address current issues in animal sciences. Projects relate to the impact of animals and animal use on humans and societal issues facing the world today. 2 undergraduate hours. No graduate credit. Prerequisite: ANSC 298. Restricted to Animal Sciences major(s). Restricted to students with Senior class standing.

**ANSC 499 Seminar credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/499/>)**

Group discussion or an experimental course on a special topic in animal sciences. 1 to 4 undergraduate hours. 1 to 4 graduate hours. May be repeated if topics vary.

**ANSC 500 Feeds in Dairy Nutrition and Diet Formulation credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/500/>)**

Students will examine the fundamentals of dairy cattle nutrition, identify common feedstuffs, and describe the basics of forage growth, harvest, insulation, and storage. Energy, carbohydrates, lipids, protein, amino acids, additives, forages, young stock, and transition cow feeding will be discussed. Students will explore common feed processing techniques, formulate diets for young and mature (lactating and non-lactating) dairy animals, and investigate the newest research insights for on-farm applications and evolving trends in dairy feeds and nutrition. Prerequisite: Restricted to Animal Sciences, MANSC, the Dairy Nutrition for Udder Success CERT, and the Livestock Systems Health, MVS. Non-degree graduate students are eligible to enroll in the course.

**ANSC 501 Nutritional Impact on Cow Health and Disorders credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/501/>)**

Explore the holistic impact of nutrition on dairy cattle health and metabolic disorder, and analyze nutrition's role in alleviating stressors. Instructors will discuss profound effects of nutrition on production, physiology, and the immune system. The course includes self-paced learning, case studies, practical insights on dairy nutrition, application of artificial intelligence (e.g., machine learning) for predicting feed intake, and collaborative discussions to address complex issues. Students can also bring and work on their own datasets. Prerequisite: Restricted to Animal Sciences, MANSC, the Dairy Nutrition for Udder Success CERT, and the Livestock Systems Health, MVS. Non-degree graduate students are eligible to enroll in the course.

**ANSC 502 What is Milk and Milk Quality credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/502/>)**

Explore the composition and synthesis of milk, maternal adaptations supporting milk production, and the impact of cow's milk on human nutrition. Students will examine the digestion of dairy products, health disorders (e.g., lactose intolerance), and milk quality. The course includes self-paced learning, current research, on-farm applications, and interactive discussions. Instructors and guest experts will present case studies, share hands-on experience in milk quality and economics, and discuss the economic relevance of milk quality. Prerequisite: Restricted to Animal Sciences, MANSC, the Dairy Nutrition for Udder Success CERT, and the Livestock Systems Health, MVS. Non-degree graduate students are eligible to enroll in the course.

**ANSC 515 Bovine Assisted Reproductive Technologies credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/515/>)**

Acquire knowledge on reproductive technologies and techniques utilized in Bovidae including *Bos taurus* and *Bos indicus* cattle. Topics include general bovine reproductive anatomy and physiology, estrus detection, estrous cycle, estrus synchronization, pregnancy diagnosis, nutrition and disease concerns, collecting oocytes and sperm, semen processing, in vitro and in vivo embryo production, and emerging assisted reproductive technologies such as AI, IVF, MOET. Prerequisite: ANSC 221 and ANSC 222 and ANSC 223 and ANSC 224 are required or equivalent.

**ANSC 520 Protein and Energy Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/520/>)**

Physiological aspects of protein and amino acids, fats and fatty acids, and carbohydrates as applied to higher animals; includes classification, digestion, absorption, utilization, metabolism, and dietary deficiencies and excesses. Same as NUTR 520. Prerequisite: MCB 450 or equivalent and ANSC 222 or equivalent.

**ANSC 521 Regulation of Metabolism credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/521/>)**

Same as FSHN 511, HK 510 and NUTR 511. See NUTR 511.

**ANSC 522 Advanced Ruminant Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/522/>)**

Physiological and microbiological aspects of ruminant digestion and their influence on the metabolism of the extraruminal tissues; interpretation of nutritive requirements in terms of rumen microbial activities; and evaluation of research techniques. Offered in alternate years. Prerequisite: ANSC 420 or equivalent, and ANSC 350, MCB 450, or equivalent.

**ANSC 523 Techniques in Animal Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/523/>)**

Discusses and applies methods of laboratory analysis and animal experimentation frequently used in nutrition research. Same as NUTR 523. Prerequisite: Courses in nutrition, physiology, and biochemistry and consent of instructor.

**ANSC 524 Nonruminant Nutrition Concepts credit: 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/524/>)**

Review of literature in nonruminant nutrition. Emphasizes basic concepts associated with food intake, carbohydrate and fat utilization, protein quality, bioavailability of nutrients, and diet formulation. Same as NUTR 524. Prerequisite: Consent of instructor.

**ANSC 525 Topics in Nutrition Research credit: 1 to 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/525/>)**

Same as FSHN 510 and NUTR 510. See NUTR 510.

**ANSC 526 Adv Companion Animal Nutrition credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/526/>)**

Students will learn how to effectively apply advanced concepts related to pet nutrition and disease, including the metabolism within healthy and diseased dogs and cats, how nutrition may aid in preventing and treating disease, and the science behind pet food formulation and production. Students will develop critical-thinking and problem-solving skills by writing and reviewing grant proposals and delivering an oral presentation. Same as NUTR 526. Prerequisite: ANSC 422 or consent of instructor.

**ANSC 533 Repro Physiology Lab Methods credit: 1 to 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/533/>)**

Laboratory methods used in reproductive physiology studies, such as blood sampling, large animal surgery, collection of tissues and gametes, embryo recovery, in vitro fertilization, tissue culture, hormone measurements, and directed individual research problems. Same as MCB 533 and CB 533. Prerequisite: Consent of instructor.

**ANSC 541 Regression Analysis credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/541/>)**

Same as CPSC 541. See CPSC 541.

**ANSC 542 Applied Bioinformatics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/542/>)**

Introduction to theoretical and applied aspects of bioinformatics. Topics include genomic and proteomic databases, sequence alignment and search algorithms (e.g., BLAST, FASTA, CLUSTAL W), predictive methods in DNA sequence, machine-learning techniques (e.g., Hidden Markov Models) and data mining, biomolecular structure and its prediction, molecular evolution and phylogenetic reconstruction, structural genomics and phylogenomics. Concepts are complemented with hands-on experience with computational biology databases and bioinformatic tools. Same as CPSC 569 and IB 506. Prerequisite: Graduate level status or consent of instructor.

**ANSC 543 Bioinformatics credit: 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/543/>)**

Same as CHBE 571, MCB 571, and STAT 530. See CHBE 571.

**ANSC 580 Artificial Intelligence and Computer Vision for Precision Management credit: 3 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/580/>)**

Use of Artificial Intelligence (AI) in optimizing precision management for agriculture and animal care. Students will explore the application of AI and computer vision techniques to assist decision-making and improve performance in the realm of precision management. Techniques of image analysis, object detection, and real-time monitoring will be covered. Finally, students will develop a hands-on project and investigate ethical considerations and industry case studies on AI-driven precision management systems with a focus on computer vision. Credit will not be given for ANSC 460 and ANSC 580 Prerequisite: ANSC 480, or ANSC 360, or demonstrated basic knowledge in Python coding, or consent of instructor.

**ANSC 590 Animal Sciences Seminar credit: 0 to 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/590/>)**

Discussions of current research and literature. Registration for 0 to 2 hours each term is expected for animal sciences graduate students. Same as NUTR 591. Course Information: Approved for Letter and S/U grading. May be repeated to a maximum of 2 hours for Masters students and 4 hours for PhD students.

**ANSC 591 Grad Bioinformatics Seminar credit: 0 to 2 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/591/>)**

Same as CPSC 591 and INFO 591. See INFO 591.

**ANSC 592 Adv Topics in Animal Science credit: 1 to 4 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/592/>)**

Selected topics associated with teaching, research, and production related to the animal industry. Prerequisite: Consent of instructor.

**ANSC 593 Res Studies in Animal Sciences credit: 1 to 8 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/593/>)**

Directed and supervised study of selected research topics in Animal Sciences. Approved for Letter and S/U grading. May be repeated in the same or separate terms to a maximum of 8 hours. Prerequisite: Consent of instructor.

**ANSC 599 Thesis Research credit: 0 to 16 Hours. (<https://courses.illinois.edu/schedule/terms/ANSC/599/>)**

Approved for S/U grading only. May be repeated in the same term or in separate terms.