Animal Science (ANSC)

Courses

ANSC 1001L. Introductory to Animal Sciences Laboratory. 1 Hour.
Study of facilities used in production, processing, and management in animal agriculture. Identification, selection evaluation and testing of livestock, meat, and milk. Laboratory 3 hours per week. (Typically offered: Fall and Spring)

ANSC 1033. Introductory Animal Sciences. 3 Hours.
Students will be introduced to biological sciences associated with modern systems of care and management of livestock. Foundation sciences include topics in genetics, nutrition, reproduction, and animal health. The importance of livestock, equine, and companion animals and their allied industries will also be discussed. (Typically offered: Fall and Spring)

ANSC 1033H. Honors Introductory Animal Sciences. 3 Hours.
Students will be introduced to biological sciences associated with modern systems of care and management of livestock. Foundation sciences include topics in genetics, nutrition, reproduction, and animal health. The importance of livestock, equine, and companion animals and their allied industries will also be discussed. Prerequisite: Honors standing. (Typically offered: Fall and Spring)

This course is equivalent to ANSC 1033.

ANSC 1062. Sustainable Integrated Small Animal Farming. 2 Hours.
Practical information on small scale animal production, including practical strategies for farm planning, issues of economic and environmental sustainability, best management practices, biosafety, disease prevention, and farm safety will be presented. (Typically offered: Spring)

This course is cross-listed with POSC 1062.

ANSC 1781. Career Preparation and Development. 1 Hour.
Course will cover concepts necessary for preparing for a career in the animal sciences and allied industries. Concepts of goal setting, effective written and verbal communications, interpersonal skills, professional behaviors, presentation skills, portfolio and resume development will be presented. (Typically offered: Spring)

This course is cross-listed with POSC 1781.

ANSC 2003. Introduction to Equine Industry. 3 Hours.
Examination of careers and business opportunities in the equine industry. Students will gain the opportunity to identify high quality horses through evaluation of conformation and locomotion. Students will also gain skill at oral presentation and be knowledgeable of costs and responsibilities associated with horse ownership. (Typically offered: Spring)

ANSC 2111L. Introduction To Animal Evaluation and Handling Lab. 1 Hour.
Laboratory component stressing fundamental concepts of animal structure, composition, and behavior, and animal handling as they relate to animal production, safety, well-being, and handler safety. One 3-hour lab weekly. Corequisite: ANSC 2113 (only for students majoring in Animal Science). Pre- or Corequisite: ANSC 1033. (Typically offered: Fall and Spring)

ANSC 2113. Introduction to Animal Evaluation and Handling. 3 Hours.
Fundamental concepts of the interrelationship of animal growth, structure, function, and animal handling as they relate to animal production, safety, well-being, and handler safety. Corequisite: ANSC 2111L (only for students majoring in Animal Science). Pre- or Corequisite: ANSC 1033. (Typically offered: Fall and Spring)

ANSC 2252L. Introduction to Livestock and Meat Evaluation. 2 Hours.
Develop an understanding between live animal evaluation and carcass composition. Comparative judging including meat evaluation, classification and selection of beef, cattle, sheep and swine. (Typically offered: Spring)

ANSC 2303L. Introduction to Horsemanship. 3 Hours.
A study of modern horsemanship training techniques involving the psychology and ethology (reason for the behavior) of equine social behavior and how it pertains to learning patterns; application of fundamental behavioral concepts in training of horses, and modification of desirable and undesirable behavioral patterns. Prerequisite: Instructor consent. (Typically offered: Fall and Spring)

ANSC 2333. Introduction to Animal Health. 3 Hours.
This course will cover the fundamental principles of animal health and disease prevention. Course discussion will include sanitation, disinfection, immunization, nutrition, housing and husbandry, causes of diseases, parasitism, clinical signs of disease, prevention and treatment options for diseases. Prerequisite: BIOL 1543 and sophomore standing. (Typically offered: Fall)

ANSC 2411L. Domestic Animal Microbiology Laboratory. 1 Hour.
This course is designed for students working on their Poultry Science, Animal Science, and/or Food Science degrees. Students enrolled in this course will learn how to collect samples aseptically from live birds and meat samples, transport samples, and culture samples on a variety of different microbiological media. In addition, students will have the opportunity to visit one of the microbiology labs in the local poultry production facilities. Students will learn how to handle samples, stain bacterial cells, and identify unknown bacteria from field samples. A lab period will be assigned to teaching students on how to use bacteria in food production by teaching students how to prepare and sample yogurt. Corequisite: ANSC 2413. (Typically offered: Fall)

This course is cross-listed with POSC 2411L.

ANSC 2413. Domestic Animal Microbiology. 3 Hours.
Basic concepts of domestic animal and poultry microbiology including diversity, genetics, metabolism, growth, control of growth, pathogenesis, and immunology. Corequisite: ANSC 2411L. Prerequisite: (BIOL 1543 and BIOL 1541L) and (CHEM 1073 and ((CHEM 1071L or CHEM 1103) or (CHEM 1123 and CHEM 1121L)). (Typically offered: Fall)

This course is cross-listed with POSC 2413.

ANSC 3003. Applied Animal Parasitology. 3 Hours.
The economically important parasites of domestic animals with emphasis on their host relationships and management considerations. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. (Typically offered: Fall Even Years)

ANSC 3013. Parasitisms of Domesticated Non-Herbivores. 3 Hours.
Course will provide applied instruction and appreciation for the parasitisms of our domesticated swine, chickens, turkeys, dogs and cats. (Typically offered: Fall Odd Years)

ANSC 3033. Animal Physiology. 3 Hours.
Fundamental aspects of central nervous, muscularkeletal, reproductive, digestive, immune, cardiovascular, respiratory and renal systems will be covered. The normal structure and function of these systems will be emphasized. Lecture 3 hours per week. Prerequisite: BIOL 1543 and (CHEM 1123 or CHEM 1073). (Typically offered: Spring)

ANSC 3072. Equine Selection and Evaluation. 2 Hours.
Students will learn criteria for evaluation and selection of breeding and show animals and will gain expertise in the evaluation of breed types and show ring characteristics. Includes field trips to various breed operations. Students in this class will be well prepared to participate in equine judging team activities. Prerequisite: Instructor consent. (Typically offered: Spring)

ANSC 3123. Principles of Genetics. 3 Hours.
Fundamentals of heredity, with special emphasis on the improvement of farm animals. Lecture 3 hours per week. Prerequisite: BIOL 1543 and MATH 1203 or higher. (Typically offered: Fall)

This course is cross-listed with POSC 3123.
ANSC 3133. Animal Breeding and Genetics. 3 Hours.
Application of the principles of genetics to the breeding of farm animals. Lecture 3 hours per week. Corequisite: Drill component. Prerequisite: MATH 1203 or higher. (Typically offered: Spring)

ANSC 3141L. Animal Nutrition Laboratory. 1 Hour.
Animal Nutrition Laboratory (FA) Practical and quantitative approach to animal nutrition; use of various methods of feedstuff evaluation including ration balancing for domestic animals. Laboratory 2 hours per week. Corequisite: ANSC 3143 for ANSC majors only. Prerequisite: MATH 1203. (Typically offered: Fall)

ANSC 3143. Principles of Animal Nutrition. 3 Hours.
Scientific approach to animal nutrition involving the mechanisms through which feed nutrients are utilized by farm animals. Lecture 3 hours per week. Corequisite: ANSC 3141L (only a corequisite for students majoring in Animal Science). Prerequisite: ANSC 1033. (Typically offered: Fall)

ANSC 3213. Behavior of Domestic Animals. 3 Hours.
Behavior associated with domestication. Effects of selective breeding, physical and social environments, and developmental stage on social organization, aggressive behavior, sexual behavior, productivity, and training of domestic animals. (Typically offered: Fall)

ANSC 3282. Livestock Judging and Selection. 2 Hours.
Comparative judging, including grading, classification, and selection of beef cattle, swine, sheep and horses. Oral and written discussion. Laboratory 6 hours per week. Prerequisite: ANSC 1033 or ANSC 2252L. (Typically offered: Fall)

ANSC 3291. Livestock Junior Judging Team Activity. 1 Hour.
Training for membership on judging teams, through participation. (Typically offered: Spring)

ANSC 3333. Diseases of Livestock. 3 Hours.
Introductory study of the diseases of farm animals with emphasis on fundamental principles of disease, body defense mechanisms, hygiene, and sanitation. Prerequisite: BIOL 1543 and ANSC 2333. (Typically offered: Spring)

ANSC 3433. Fundamentals of Reproductive Physiology. 3 Hours.
Principles of mammalian reproductive physiology with emphasis on farm animals. Lecture 3 hours per week. Pre- or Corequisite: ((CHEM 1073 and CHEM 1071L) or (CHEM 1123 and CHEM 1121L) or (CHEM 2613 and CHEM 2611L) or (CHEM 3603 and CHEM 3601L)) and junior standing. Prerequisite: BIOL 1543. (Typically offered: Fall)

ANSC 3491L. Artificial Insemination in Cattle. 1 Hour.
Experience with artificial insemination technique in cattle including estrus detection, semen storage and handling, insemination equipment maintenance and technique. Laboratory 4 hours per week. The course is offered the second 8 weeks of the spring semester. Pre- or Corequisite: ANSC 3433 or instructor consent. (Typically offered: Fall)

ANSC 3513H. Honors Current Approaches in Agricultural Laboratory Research. 3 Hours.
A laboratory course to introduce students to current laboratory research techniques used in agricultural and life sciences. Hands-on laboratory exercises will emphasize current cellular and molecular research techniques, laboratory notebook keeping, data interpretation, and presentation of results. Prerequisite: BIOL 1543 and honors standing. (Typically offered: Spring Even Years)
This course is cross-listed with POSC 3513H.

ANSC 3613. Meat Science. 3 Hours.
The study of meat science and muscle biology. Topics will include animal/tissue growth and development and the relationship to meat quality. Meat processing, preservation, and meat safety concerns will also be considered. Lecture 3 hours per week. (Typically offered: Spring)

ANSC 3723. Horse and Livestock Merchandising. 3 Hours.
Various types of merchandising programs for specific livestock enterprises will be presented. Students will evaluate the effectiveness of merchandising programs including how to organize, advertise, and manage a purebred auction sale of livestock. (Typically offered: Fall)

ANSC 3753. Equine Assisted Activities and Therapies. 3 Hours.
Animal Science 3753 introduces students to the field of equine assisted activities and therapies. A variety of approaches, therapeutic settings and client populations will be addressed with an emphasis on equine behavior. Students will gain experience in the practical application of an equine assisted therapy program. (Typically offered: Fall)

ANSC 3761L. Ranch Horse Riding. 1 Hour.
This course is designed for students to have the opportunity to practice and/or compete in ranch horse competition as well as experience horseback ranch work. The class will consist mostly of hands-on participation at the Whitaker Arena as well as various competition and ranch sites around the region and country. Students will learn the value of the horse in livestock production as well as the competition portion of the equine industry. The Ranch Horse Team is a flagship for the University of Arkansas, Bumper’s College Department of Animal Science. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ANSC 3773. Equine Behavior. 3 Hours.
Students will be introduced to equine behavior and its application to equine management and training. Course will cover identifying behaviors, senses and memory of the horse, horse-human interaction, how horses learn, the application of classical conditioning and equine welfare. (Typically offered: Summer)

ANSC 400V. Special Problems. 1-6 Hour.
Special problems in the animal sciences for advanced undergraduate students. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANSC 401V. Internship in Animal Sciences. 1-6 Hour.
Supervised work experience with private or government organizations. Prerequisite: Junior standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANSC 4072. Advanced Equine Selection and Evaluation. 2 Hours.
Advanced evaluation and selection of breeding and show animals, evaluation of breed types and show characteristics. Field trips to breeding operations. Competitive Judging team members come from this course and participation in competitive events will be required. Prior equine evaluation is not necessary, but instructor consent is required. Some Saturday activities. Prerequisite: ANSC 3072 or instructor consent. (Typically offered: Fall)

ANSC 410V. Special Topics in Animal Sciences. 1-4 Hour.
Topics not covered in other courses or a more intensive study of specific topics in animal sciences. (Typically offered: Irregular) May be repeated for degree credit.

ANSC 410VH. Honors Special Topics in Animal Sciences. 1-4 Hour.
Topics not covered in other courses or a more intensive study of specific topics in animal sciences. Prerequisite: Honors standing. (Typically offered: Irregular) May be repeated for degree credit.
This course is equivalent to ANSC 410V.

ANSC 4123. Legal Issues in Animal Agriculture. 3 Hours.
An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues. The wide range of regulation-from local to state to federal, depending on the issue- will be studied and discussed. (Typically offered: Spring Odd Years)
This course is cross-listed with AGEC 4123, POSC 4123.
ANSC 4142. Advanced Animal Handling Techniques. 2 Hours.
This course is designed to familiarize students with handling techniques of a variety of animals, including cattle, sheep, horses, pigs, dogs, and others. Students will learn and practice handling, restraint, and common husbandry procedures with a variety of domestic species. The course will provide valuable preparation for careers in livestock management, vet medicine, animal-based research, and other fields in animal science. Prerequisite: Junior standing or consent. (Typically offered: Fall and Spring)

ANSC 4163. Companion Animal Nutrition. 3 Hours.
This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring)

ANSC 4173. Thoroughbred Horse Industry. 3 Hours.
This course is designed to give you an overview of the Thoroughbred breed and industry. Students will gain an understanding of the Thoroughbred industry, its history, and modern practices. Students will also gain an understanding of career potential in the Thoroughbred industry. Prerequisite: Instructor consent and Junior or Senior standing. (Typically offered: Spring Odd Years)

ANSC 4181. Kentucky Thoroughbred Tour. 1 Hour.
An overview of the Thoroughbred industry in central Kentucky through visiting major racetracks, world-class Thoroughbred breeding facilities, major equine veterinary practices, world class equine sales facilities, equine rehabilitation and retirement facilities, equine nutritional research facilities, and visit with horse trainers, veterinarians and farm managers. Successful completion of all course requirements and the tours will enable students to obtain 1 credit in animal science, network in the equine industry and critically assess potential careers. Prerequisite: Instructor consent. (Typically offered: Summer Odd Years)

ANSC 4252. Cow-Calf Management. 2 Hours.
Systems of cow-calf management including the practical application of the principles of breeding, feeding, and management to commercial and purebred beef cattle under Arkansas conditions. Prerequisite: Must be a student in the Bumpers College of Agricultural, Food and Life Sciences, ANSC 1033 and Junior standing or higher. (Typically offered: Fall)

ANSC 4262. Swine Production. 2 Hours.
Methods in producing purebred and commercial swine with specific emphasis on the management programs needed for profitable pork production in Arkansas. Prerequisite: Must be a student in Bumpers College of Agricultural, Food and Life Sciences, ANSC 1033 and Junior standing or higher. (Typically offered: Fall)

ANSC 4272. Sheep Production. 2 Hours.
Purebred and commercial sheep management emphasizing the programs of major importance in lamb and wool production in Arkansas. Prerequisite: Must be a student in Bumpers College of Agricultural, Food and Life Sciences, ANSC 1033 and Junior standing or higher. (Typically offered: Fall)

ANSC 4282. Horse Production. 2 Hours.
Production, use and care of horses and ponies including breeding, feeding, handling, and management. Lecture 1 hours, laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: Junior standing or higher. (Typically offered: Spring)

ANSC 4291. Livestock Senior Judging Team Activity. 1 Hour.
Training for membership on judging teams, through participation. (Typically offered: Fall)

ANSC 4303. Comparative Veterinary Anatomy. 3 Hours.
Study of structures and principles of anatomy of major domestic species. The dog, horse, and cow will be used as models for anatomical structures and the application of anatomical knowledge in animal science; focus on veterinary applications. 3 hours of lecture each week. Spring semesters. Corequisite: Lab component. Prerequisite: ANSC 1033 or BIOL 1543, junior standing or instructor consent. (Typically offered: Fall and Spring)

ANSC 4452. Milk Production. 2 Hours.
Principles of breeding, feeding, and management of dairy cattle will be studied. Prerequisite: Must be a student in the Bumpers College of Agricultural, Food and Life Sciences, ANSC 1033 and Junior standing or higher. (Typically offered: Fall Odd Years)

ANSC 4482. Companion Animal Management. 2 Hours.
The study and application of principles of domestication, nutrition, reproduction, parasitology, diseases, behavior, and husbandry management to companion animals. Dogs, cats, and exotic animals will be the species of primary interest. Practical problems of care and management of these species will be solved. Prerequisite: BIOL 1543 or equivalent or consent of instructor. (Typically offered: Spring)

ANSC 4553. Forage-Ruminant Relations. 3 Hours.
Chemical, physical, and botanical characteristics of forage plants, the dynamics of grazing, intake, digestion, behavior, and nutrient cycling at the plant-animal interface. CSES 1203 recommended. Corequisite: Lab component. Prerequisite: ANSC 3143. (Typically offered: Fall Even Years)

ANSC 4613. Muscle Growth and Development. 3 Hours.
This is an undergraduate level course offering detailed insights into skeletal muscle morphological, physiological, cellular, and molecular factors affecting muscle structure and function, with special emphasis on cellular and molecular regulation of muscle growth and development, such as myo-, fibro-, and adipogenesis. And the relationship between the properties of skeletal muscle and meat quality. ANSC 3033 and(or) CHEM 3813 are recommended as a prerequisite(s). (Typically offered: Fall)

ANSC 4613. Muscle Growth and Development. 3 Hours.
This is an undergraduate level course offering detailed insights into skeletal muscle morphological, physiological, cellular, and molecular factors affecting muscle structure and function, with special emphasis on cellular and molecular regulation of muscle growth and development, such as myo-, fibro-, and adipogenesis. And the relationship between the properties of skeletal muscle and meat quality. ANSC 3033 and(or) CHEM 3813 are recommended as a prerequisite(s). (Typically offered: Fall)

An experiential-learning course with an embedded trip to Panama designed to give students an overview of the agricultural industry and the impact of Panamanian history, culture and geography on agriculture and how this contrasts with practices in the US. Students will participate in a study tour to Panama where they will engage in learning experiences that explore the agriculture, history, and culture of this country. They will have the opportunity to visit and learn from successful producers of livestock and agricultural staples as well as tour the Panama canal and learn about Panamanian culture and history. Prerequisite: Instructors consent and approval from Study Abroad office. (Typically offered: Spring)

ANSC 4923. Brain & Behavior. 3 Hours.
Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory systems and the autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with POSC 4923.
ANSC 4993. Animal Science Capstone. 3 Hours.
The purpose of this course is to provide students with an opportunity to apply and integrate knowledge from previous coursework in general education and animal science. This course is a multiple experience/exercise capstone course and is designed for students to demonstrate mastery of a particular subject within Animal Science. Students will provide evidence of integrated knowledge through a variety of means including oral presentations, creation of a 1250-word reflective essay, writing a research abstract and applying problem solving and critical thinking skills. Prerequisite: Senior standing. (Typically offered: Fall and Spring)

ANSC 500V. Special Problems. 1-6 Hour.
Work in special problems of animal industry. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANSC 5013. Domestic Animal Energetics. 3 Hours.
Physical, physiological and biochemical aspects of energy metabolism of domestic animals and their applications to livestock production. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

ANSC 5023. Legal Issues in Animal Agriculture. 3 Hours.
An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues. The wide range of regulation-from local to state to federal, depending on the issue-will be studied and discussed. Graduate degree credit will not be given for both ANSC 4123 and ANSC 5023. (Typically offered: Spring Odd Years)

ANSC 5052. Cow-Calf Management. 2 Hours.
Systems of cow-calf management including the practical application of the principles of breeding, feeding, and management to commercial and purebred beef cattle under Arkansas conditions. Graduate degree credit will not be given for both ANSC 4252 and ANSC 5052. (Typically offered: Fall)

ANSC 510V. Special Topics in Animal Sciences. 1-4 Hour.
Topics not covered in other courses or a more intensive study of specific topics in animal sciences. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

ANSC 5123. Advanced Animal Genetics. 3 Hours.
Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: ANSC 3123. (Typically offered: Fall Even Years) This course is cross-listed with POSC 5123.

ANSC 5143. Biochemical Nutrition. 3 Hours.
Interrelationship of nutrition and physiological chemistry; structure and metabolism of physiological significant carbohydrates, lipids, and proteins; integration of metabolism with provision of tissue fuels; specie differences in regulatory control of tissue and whole body metabolism of nutrients. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years) This course is cross-listed with POSC 5143.

ANSC 5152. Protein and Amino Acid Nutrition. 2 Hours.
Students will be introduced to the basic processes of protein digestion, amino acid absorption, transport, metabolism, and utilization along with how biochemical function of proteins and their dynamic state affect nutritional status for animals and man. Prerequisite: CHEM 3813. (Typically offered: Spring Even Years) This course is cross-listed with POSC 5152.

ANSC 5163. Companion Animal Nutrition. 3 Hours.
This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring) This course is cross-listed with POSC 5163.

ANSC 5262. Swine Production. 2 Hours.
Methods in producing purebred and commercial swine with specific emphasis on the management programs needed for profitable pork production in Arkansas. Graduate degree credit will not be given for both ANSC 4262 and ANSC 5262. (Typically offered: Fall Even Years)

ANSC 5272. Sheep Production. 2 Hours.
Purebred and commercial sheep management emphasizing the programs of major importance in lamb and wool production in Arkansas. Graduate degree credit will not be given for both ANSC 4272 and ANSC 5272. (Typically offered: Spring)

ANSC 5283. Horse Production. 3 Hours.
Production, use and care of horses and ponies including breeding, feeding, handling, and management. Lecture 2 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both ANSC 4282 and ANSC 5283. Corequisite: Lab component. (Typically offered: Spring)

ANSC 5452. Milk Production. 2 Hours.
Principles of breeding, feeding, and management of dairy cattle will be studied. Graduate degree credit will not be given for both ANSC 4452 and ANSC 5452. (Typically offered: Fall Odd Years)

ANSC 5482. Companion Animal Management. 2 Hours.
The study and application of principles of domestication, nutrition, reproduction, parasitology, diseases, behavior, and husbandry management to companion animals. Dogs, cats, and exotic animals will be the species of primary interest. Practical problems of care and management of these species will be solved. Graduate degree credit will not be given for both ANSC 4482 and ANSC 5482. Prerequisite: BIOL 1543 or equivalent or consent of instructor. (Typically offered: Spring)

ANSC 5553. Forage-Ruminant Relations. 3 Hours.
Advanced chemical, physical, and botanical characteristics of forage plants, the dynamics of grazing, intake and digestion, and techniques of measuring forage utilization and systems analysis at the plant-animal interface. Lecture 3 hours per week. CSES 1203 recommended. Corequisite: Lab component. Prerequisite: ANSC 3143. (Typically offered: Fall Even Years)

ANSC 5613. Muscle Growth and Development. 3 Hours.
This is a graduate level course offering detailed insights into skeletal muscle morphological, physiological, cellular and molecular factors affecting muscle structure and function, with special emphasis on cellular and molecular regulation of muscle growth and development, such as myo-, fibro-, and adipo-genesis. And the relationship between the properties of skeletal muscle and meat quality. Graduate students will focus on the scientific reading, problem solving, and generating research ideas. ANSC 3033, CHEM 3813 or ANSC 5143 or an equivalent course are recommended as a prerequisite. (Typically offered: Fall) This course is cross-listed with POSC 5613.

ANSC 5652. Stocker-Feedlot Cattle Management. 2 Hours.
Production and management systems for stocker and feed-lot cattle including practical applications of forage systems, feeding, health management and economics of production of these livestock. Graduate degree credit will not be given for both ANSC 4652 and ANSC 5652. (Typically offered: Fall)
An experiential-learning course with an embedded trip to Panama designed to give students an overview of the agricultural industry and the impact of Panamanian history, culture and geography on agriculture and how this contrasts with practices in the US. Students will participate in a study tour to Panama where they will engage in learning experiences that explore the agriculture, history, and culture of this country. They will have the opportunity to visit and learn from successful producers of livestock and agricultural staples as well as tour the Panama canal and learn about Panamanian culture and history. Prerequisite: Instructor consent and approval from Study Abroad office. (Typically offered: Spring)

ANSC 5743L. Advanced Analytical Methods in Animal Sciences Laboratory. 3 Hours.
Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. (Typically offered: Fall)
This course is cross-listed with POSC 5743L.

ANSC 5853. Advanced Meats Technology. 3 Hours.
An intensive study of processed meats, relating the science, technology, and quality of further processed meat and poultry products. Product development, sensory and chemical analysis, microbiology, nutritional aspects, and product labeling are covered. Prerequisite: POSC 4314 or ANSC 3613. (Typically offered: Spring Even Years)

ANSC 5901. Seminar. 1 Hour.
Critical review of the current scientific literature pertaining to the field of animal science. Oral reports. Lecture 1 hour per week. Prerequisite: Senior standing. (Typically offered: Fall)

ANSC 5923. Brain & Behavior. 3 Hours.
Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory systems and the autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)
This course is cross-listed with POSC 5923.

ANSC 5932. Cardiovascular Physiology of Domestic Animals. 2 Hours.
Cardiovascular physiology, including mechanisms of heart function and excitation, and blood vessel mechanisms associated with the circulatory system in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component.
Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)
This course is cross-listed with POSC 5932.

ANSC 5943. Endocrine Physiology of Domestic Animals. 3 Hours.
Endocrine physiology, including mechanisms of hormone secretion, function, and regulation. Mechanisms associated with the endocrine system will be discussed for domestic animals and poultry. Prerequisite: POSC 3033 or ANSC 3033. Pre- or Corequisite: CHEM 3813. (Typically offered: Spring Even Years)

ANSC 5952. Respiratory Physiology of Domestic Animals. 2 Hours.
Respiratory physiology, including mechanisms of lung function and gas exchange. Mechanisms associated with the interaction of the respiratory system with other bodily systems in domestic animals and poultry will be discussed. Lecture 3 hours; drill 1 hour per week for first 8 weeks of semester. Pre- or Corequisite: CHEM 3813. Corequisite: Drill component.
Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Spring)
This course is cross-listed with POSC 5952.

ANSC 5962. Gastrointestinal/Digestive Physiology of Domestic Animals. 2 Hours.
Gastrointestinal and hepatic physiology, including mechanisms of digestion, absorption of nutrients with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component.
Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)
This course is cross-listed with POSC 5962.

ANSC 5972. Renal Physiology. 2 Hours.
Renal physiology, including mechanisms of renal clearance with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Spring)

ANSC 600V. Master's Thesis. 1-6 Hour.
Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall and Summer) May be repeated for degree credit.

ANSC 6143. Minerals in Animal Nutrition. 3 Hours.
Mineral nutrients, their sources and functions, as related to nutrition of domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Fall; Spring Even Years)

ANSC 6243. Ruminant Nutrition. 3 Hours.
Anatomy and physiology of the rumen. The nutrient requirements of microbial organisms and the relation of microbial digestion in the rumen to the nutrition of cattle, sheep and other ruminants. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

ANSC 6343. Vitamin Nutrition and Metabolism. 3 Hours.
The vitamins required for humans and domestic animals for a healthy life with emphasis on absorption, transport, metabolism, biopotency, mechanism of action, tissue retention and turnover. Prerequisite: CHEM 3813. (Typically offered: Fall Odd Years)
This course is cross-listed with FDSC 6343, POSC 6343.

ANSC 6833. Reproduction in Domestic Animals. 3 Hours.
Comprehensive review of current theory of reproductive function in domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3433. (Typically offered: Spring Even Years)

ANSC 700V. Doctoral Dissertation. 1-18 Hour.
Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.