

# ANIMAL AND FOOD SCIENCES

Animal science focuses on the science and business of the production of beef cattle, dairy cattle, horses, poultry, sheep, goats, swine, and pet/companion animals. An animal scientist is concerned with the application of the principles of the biological, physical, and social sciences associated with domestic animal production and management. Sustainability of livestock production systems is critical to feed the world safe, high-quality protein. Thus, meat production is a critical component of animal sciences.

The food industry is one of the largest and most important industries in the United States. Food scientists are concerned with the processing, safety, quality, and marketing of food, as well as the research and development of new products or improved processes to feed the continued growing world's population.

Undergraduate students may elect to pursue a Bachelor of Science degree in the department by majoring in either animal science or food science. Internship programs providing one to six months of off-campus work experience are available in all animal science options and are part of the curriculum for food science. Participation in undergraduate organizations (Leaders of Excellence in Animal and Food Sciences, Block and Bridle, Dairy Science, Horsemen's Association, Food Science Club, Meat Science Association, Oklahoma Collegiate Cattlewomen, Oklahoma Collegiate Cattlemen, Pre-Vet Club, Swine Club), judging teams (dairy cattle, horses, livestock, meat, or meat animal evaluation) and academic programs (honors, undergraduate research scholars, and academic quadrathlon) improve social, communication, leadership and academic skills and abilities.

## Animal Science

Within the Animal Science major undergraduate students elect one of four options (predefined emphasis areas) of study: 1) General Animal Science, (2) Business/ Pre-Law, 3) Pre-Veterinary/ Pre-Medical, 4) Production and Operations. In addition, students have an opportunity to concentrate their studies on one or more animal species.

Students interested in veterinary medicine may complete the pre-veterinary medicine requirements at the same time they are working toward a BS degree in Animal Science. In addition, pre-vet students gain valuable insight into the care and management of domestic animals throughout the Animal Science curriculum.

Undergraduate students follow a similar curriculum during the first two years which includes basic courses in the physical, biological, and social sciences, and a series of introductory courses in agriculture and business. Upper-class students take a basic core of advanced Animal Science courses, including anatomy and physiology, genetics, reproductive physiology, and nutrition. As seniors, students complete a series of advanced Animal Science courses designed to apply knowledge obtained in previous courses to livestock systems. Every opportunity is taken to utilize the excellent herds and flocks owned or operated by the department.

Students completing an Animal Science degree have a wide choice of challenging careers, including ownership or management of farms, ranches or feedlots; employment with state and federal agencies concerned with inspection, grading or regulation; banking and financial activities, sales and service positions with companies involved with feeds, pharmaceuticals or other animal products; biotechnology; opportunities in Agricultural Extension or teaching; and work in the

processing, distributing and merchandising of dairy, poultry and meat products. In addition, students have an opportunity to pursue advanced degrees in animal science or other professional degrees, including veterinary medicine, human medicine, dentistry, pharmacy, and law.

## Minor in Animal Science

As a supplement to their chosen major, Animal Science coursework required for the minor will provide students with the knowledge to be competitive and succeed in the animal agriculture industry. The requirements include ANSI 1023 and ANSI 1021 Introduction to the Animal Sciences and 18 additional hours of Animal Science courses the student can select to personalize their programs. The basic core of advanced Animal Science courses includes anatomy and physiology, genetics, reproductive physiology, and nutrition. Students can then take advanced Animal Science courses designed to apply knowledge obtained in previous courses to animal systems.

## Food Science

Food Science is an applied field. A food scientist is someone who applies the basic sciences: biology, physics, chemistry, and mathematics to further their understanding of the factors that affect food quality, safety, and nutrition. Food science is applied to the selection, preservation, processing, packaging, distribution, and use of safe, nutritious, and wholesome foods.

There are four study emphasis areas within the food science major: Science, Industry, Meat Science and Food Safety.

The Science emphasis gives students a well-rounded background in chemistry, physics, mathematics, and biology as well as Food Science. Students who elect this emphasis area usually have a primary interest in science and will be prepared to enter graduate education programs in Food Science.

This Science emphasis is also an excellent choice for students interested in professional schools such as medical school, dental school, pharmacy, or physical therapy. Students who elect not to pursue a graduate degree or a professional degree are prepared to work in any facet of the food industry, especially those jobs focused on research, product development and food analysis.

The Industry emphasis provides a basic understanding of the chemical and physical processes of food processing. Students pursuing this option are prepared to enter food plant management, quality assurance, quality control, product development and sales.

The Meat Science emphasis provides a background knowledge and understanding in live animal production, slaughter and fabrication, and meat processing, along with a basic understanding of chemical and physical processes of meat production. Students pursuing this option are prepared to enter the meat industry working in quality assurance, slaughter/fabrication, meat processing, product development and sales.

The Food Safety emphasis provides knowledge and experience in food safety issues and practices affecting all sectors of the food industry from production agriculture to wholesale and retail distribution channels. Students pursuing this option are prepared to enter the food industry with expertise in food safety programs, auditing, and quality assurance.

## Minor in Food Science

The minor includes the core courses in Food Science. Requirements include FDSC 1133 Fundamentals of Food Science and 17 additional

hours of Food Science courses the student can select from to personalize their programs. The core of Food Science courses includes food chemistry, food microbiology, quality control and food analysis. There are also courses in specialized areas (e.g., meat science, dairy products) for students interested those industries. Students can complete their program with advanced courses in these areas.

## Undergraduate Certificates

Undergraduate students in any OSU major can participate in our Equine Enterprise Management Certificate Program. This certificate program gives students an education focused on equine while preparing them to be knowledgeable professionals in the horse industry through advanced training and hands-on learning. The program is designed to ensure students are career-ready by equipping them with the knowledge and skills necessary to enter the horse industry.

Students from any OSU major can complete our Food Safety Certificate Program. The certificate program participants receive hands-on regulatory and customer-driven food safety programs training to prepare them for careers in the food industry. Students will have the opportunity to receive six internationally recognized certificates on HACCP, FSMA, and audit programs as part of their coursework. The program is designed to provide the food industry well-trained, qualified quality assurance professionals.

## Courses

### ANSI 1021 Introduction to the Animal Sciences Lab

**Prerequisites:** Concurrent enrollment in ANSI 1023.

**Description:** Laboratory to accompany ANSI 1023 - species adaptability, product standards and requirements areas and types of production, processing and distribution of products, includes meat animals, dairy and poultry.

**Credit hours:** 1

**Contact hours:** Lab: 2 Contact: 2

**Levels:** Undergraduate

**Schedule types:** Lab

**Department/School:** Animal & Food Sciences

### ANSI 1023 Introduction to the Animal Sciences

**Prerequisites:** Concurrent enrollment in ANSI 1021.

**Description:** Species adaptability, product standards and requirements areas and types of production, processing and distribution of productions, includes meat animals, dairy and poultry. Previously offered as ANSI 1124.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Animal & Food Sciences

### ANSI 1124 Introduction to the Animal Sciences

**Description:** Species adaptability, product standards and requirements, areas and types of production, processing and distribution of products, includes meat animals, dairy and poultry.

**Credit hours:** 4

**Contact hours:** Lecture: 3 Lab: 2 Contact: 5

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Animal & Food Sciences

### ANSI 1401 Equine Behavior and Handling

**Description:** Equine management techniques - understanding equine behavior and anatomy. Basic equine handling, management principles, hoof care, dental care, first aid and wound care. Introduction to behavior and training of the horse, techniques of safe handling based on the principles of equine behavior.

**Credit hours:** 1

**Contact hours:** Lab: 2 Contact: 2

**Levels:** Undergraduate

**Schedule types:** Lab

**Department/School:** Animal & Food Sciences

### ANSI 2111 Animal and Food Science Professional Development

**Description:** Student development through study of career goals specific to animal or food science, eventual career development through resume building, internships, and networking. Previously offered as ANSI 1111.

**Credit hours:** 1

**Contact hours:** Lecture: 1 Contact: 1

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Animal & Food Sciences

### ANSI 2112 Live Animal Evaluation

**Prerequisites:** ANSI 1124.

**Description:** Using tools for selection including performance records, pedigree information and visual appraisal, in the evaluation of cattle, swine, sheep, horses and poultry.

**Credit hours:** 2

**Contact hours:** Lab: 4 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab

**Department/School:** Animal & Food Sciences

### ANSI 2123 Livestock Feeding

**Description:** Nutrients and their functions, nutrient requirements of the various classes of livestock; composition and classification of feed stuffs and ration formulation. Not required of animal science majors.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Animal & Food Sciences

### ANSI 2233 The Meat We Eat

**Description:** Overview of all animal, poultry, and fish protein sources used for human consumption, but focusing on red meat. Examination of each phase of production, inspection, safety, grading, processing, preparation, and current issues of the industries. Development of an understanding of the importance of meat in the diet and part of global agriculture. Same course as FDSC 2233.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Animal & Food Sciences

### ANSI 2253 Meat Animal and Carcass Evaluation

**Description:** Evaluation of carcasses and wholesale cuts of beef, pork, and lamb. Factors influencing grades, yields and values in cattle, swine and sheep. Same course as FDSC 2253.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Animal & Food Sciences

**ANSI 3123 Livestock Health and Diseases****Prerequisites:** ANSI 1124.**Description:** Diseases of farm animals, both infectious and noninfectious, parasites, parasitic diseases, and the establishment of immunity through the use of biological products, prevention and/or treatment.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3212 Advanced Dairy Cattle Evaluation****Description:** Advanced evaluation of type traits as they relate to longevity and profitability in the dairy cow.**Credit hours:** 2**Contact hours:** Contact: 4 Other: 4**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 3222 Advanced Equine Evaluation****Description:** Advanced evaluation of halter and performance horses.

Includes both Western and English disciplines.

**Credit hours:** 2**Contact hours:** Lab: 4 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences**ANSI 3232 Advanced Meat Evaluation****Description:** Advanced evaluation of carcasses and wholesale cuts of beef, pork and lamb. Same course as FDSC 3232.**Credit hours:** 2**Contact hours:** Lab: 4 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences**ANSI 3242 Advanced Livestock Evaluation****Prerequisites:** ANSI 2112.**Description:** Advanced evaluation of beef cattle, sheep, and swine.**Credit hours:** 2**Contact hours:** Lab: 4 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences**ANSI 3252 Advanced Wool Evaluation****Description:** Advanced instruction in wool grading.**Credit hours:** 2**Contact hours:** Lab: 4 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences**ANSI 3310 Advanced Competitive Evaluation****Prerequisites:** Consent of instructor.**Description:** Advanced instruction in animal and/or product evaluation. For students competing on collegiate judging teams. Same course as FDSC 3310. Offered for fixed credit, 2 credit hours, maximum of 6 credit hours.**Credit hours:** 2**Contact hours:** Lab: 6 Contact: 6**Levels:** Undergraduate**Schedule types:** Clinical**Department/School:** Animal & Food Sciences**ANSI 3312 Advanced Meat Animal Evaluation****Description:** Advanced evaluation and pricing of meat animals. For students competing on the Meat Animal Evaluation Team.**Credit hours:** 2**Contact hours:** Contact: 4 Other: 4**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 3322 Applied Meat Animal Selection****Prerequisites:** ANSI 3310 and consent of instructor.**Description:** Applied selection of meat animals using principles of genetics, animal breeding, and phenotypic evaluation in real world selection scenarios to predict the value of breeding and market livestock.**Credit hours:** 2**Contact hours:** Contact: 6 Other: 6**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 3333 Meat Science****Description:** Anatomical and basic chemical and physical characteristics of meat animals studied. The application of scientific principles to the processing and economical utilization of meat animals, as well as in the manufacture of meat products emphasized in the laboratory. Same course as FDSC 3333. May not be used for degree credit with ANSI 5433.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3402 Equine Training Methods****Description:** Basic techniques of equine training. Performance of various maneuvers including halter breaking, saddling, longing, driving, and riding. Course previously offered as ANSI 3202.**Credit hours:** 2**Contact hours:** Lab: 4 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences

**ANSI 3410 Peer-Led Team Learning in Animal Science****Prerequisites:** Consent of instructor.**Description:** Selected undergraduate students work as peer leaders for learning teams for Animal Science courses. Development of oral and written communication skills of technical concepts in animal science. Duties include meeting regularly with discussion and laboratory sessions, participating in instructional activities and evaluating class performance. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours. Lab 1-5.**Credit hours:** 1-6**Contact hours:** Lecture: 1 Lab: 2-10 Contact: 3-11**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3414 Form and Function of Livestock and Poultry****Prerequisites:** ANSI 1124 and BIOL 1114 or (BIOL 1113 and BIOL 1111) or consent of instructor.**Description:** Form and function of livestock and poultry. Major systems (muscle, skeletal, neural, endocrine, cardiovascular, respiratory and gastrointestinal) with emphasis on comparative anatomy and integrated function related to livestock in agricultural production systems.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 2 Contact: 5**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3420 Undergraduate Research in Animal and Food Science****Description:** Designed for students participating in undergraduate research in Animal and Food Sciences. Students actively participate in research methodologies, including foundational research theories and protocols. Previously offered as ANSI 1223. Offered for variable credit, 1-4 credit hours, maximum of 4 credit hours.**Credit hours:** 1-4**Contact hours:** Contact: 1-4 Other: 1-4**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 3423 Animal Genetics****Prerequisites:** Undergraduate level BIOL 1114 or (BIOL 1113 and BIOL 1111), minimum grade of C.**Description:** The basic principles of heredity including: kinds of gene action, random segregation, independent assortment, physical and chemical basis of heredity, mutations, sex-linkage, chromosome mapping, multiple alleles and chromosomal abnormalities. Also a brief introduction to quantitative inheritance and population genetics.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3433 Animal Breeding****Prerequisites:** ANSI 3423.**Description:** The application of genetic principles to livestock improvement; study of the genetic basis of selection and systems of mating; development of breeding programs based on principles of population genetics.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3444 Animal Reproduction****Prerequisites:** Introductory biology.**Description:** Physiological processes of reproduction in farm animals including male and female anatomy, gonad function, endocrine relationships, fertility, and factors affecting reproduction efficiency. In the laboratory, emphasis on artificial insemination, estrous synchronization, embryo production via multiple ovulation embryo transfer (MOET) and in vitro fertilization (IVF), cryopreservation of gametes or embryos, and pregnancy determination. Previously offered as ANSI 3443.**Credit hours:** 4**Contact hours:** Lecture: 3 Lab: 2 Contact: 5**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3453 Canine and Feline Genetics****Prerequisites:** BIOL 1114 or (BIOL 1113 and BIOL 1111) or consent of instructor.**Description:** Overview of fundamental genetic principles and the control of genetic variation in coat color, various disorders and other inherited feline and canine characteristics. Inherited conditions, the underlying genetic mutation if known, genomic technologies used to identify the mutations if unknown, and development of genetic tools to assist in canine and feline genetic testing and selection programs.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3463 Equine Genetics****Description:** Basic Mendelian genetics with direct application to horses. Genetic principles and inheritance of particular equine characteristics and common genetic disorders.**Credit hours:** 3**Contact hours:** Contact: 3 Other: 3**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 3533 Equine Management and Production****Description:** Current topics and trends in the horse industry. Basic principles of equine nutrition, reproduction, marketing, exercise physiology, health care, coat-color genetics, behavior and welfare.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences

**ANSI 3543 Principles of Animal Nutrition****Prerequisites:** CHEM 1215 or equivalent.**Description:** Basic principles of animal nutrition including digestion, absorption, and metabolism of the various food nutrients; characteristics of the nutrients; measure of body needs; ration formulation.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3623 Livestock Behavior and Environmental Interactions****Prerequisites:** ANSI 1124.**Description:** Animal behavior and animal-environment interactions related to health, productivity, and overall well-being of food animals. Concepts to improve housing accommodations, management strategies for animals to improve animal and human well-being and to use behavior as a tool for assessing welfare and improving human-animal interactions.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3633 Equine Sales Preparation****Description:** Discussion and application of equine behavior modification and training techniques. Sale preparation, marketing techniques. Students will be responsible for completing safe and successful groundwork and riding of an OSU 2-year-old. Riding experience required.**Credit hours:** 3**Contact hours:** Lab: 6 Contact: 6**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences**ANSI 3643 Equine Breeding and Foaling****Description:** Discussion and application of current management practices in horse reproduction. Breeding methods and foaling procedures, safety and biosecurity, health and nutrition, reproductive anatomy and hormones, behavior and handling.**Credit hours:** 3**Contact hours:** Lecture: 1 Lab: 4 Contact: 5**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3651 Applied Animal Nutrition Lab****Prerequisites:** ANSI 3543 and ANSI 3653 (or concurrent enrollment in ANSI 3653).**Description:** Basic nutritional calculations and ration formulation for various classes of livestock; Formulation of rations and supplements to meet specific requirements using spreadsheet based formulators.**Credit hours:** 1**Contact hours:** Lab: 2 Contact: 2**Levels:** Undergraduate**Schedule types:** Lab**Department/School:** Animal & Food Sciences**ANSI 3653 Applied Animal Nutrition****Prerequisites:** ANSI 3543.**Description:** Composition, characteristics, and nutritive value of feeds and feed additives; feed labeling and regulation; qualitative and quantitative nutrient requirements of various classes of livestock; theory of feeding and supplementing various classes of livestock to meet specific nutrient requirements.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3703 Animal Management Techniques****Description:** Animal handling and management practices. Basic husbandry procedures for domestic animals in farm, ranch, and/or other production settings or environments. Emphasis on practical handling, restraint, health evaluation, medication and treatment practices.**Credit hours:** 3**Contact hours:** Lecture: 1 Lab: 4 Contact: 5**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 3753 Basic Nutrition for Pets****Description:** Nutrients, nutrient requirements, feeding practices, food sources, and diet management for pets and companion animals as well as exotic animals and birds.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 3903 Agricultural Animals of the World (I)****Description:** The production and utilization of agricultural animals by human societies.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**General Education and other Course Attributes:** International Dimension**ANSI 4023 Poultry Science****Prerequisites:** ANSI 1124 or (ANSI 1023 and ANSI 1021) and ANSI 3543.**Description:** Application of poultry physiology to the management and production of commercial broilers, layers, and turkeys using a science-based approach to evaluate industry practices, compare economic factors, and welfare standards between breeds and housing systems.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal Science



**ANSI 4132 Welfare Assessment and Audit of Farm Animals****Prerequisites:** ANSI 3623.**Description:** Reliable, science-based, on-farm and slaughter welfare assessment systems for cattle, pigs and poultry as well as a methodology to convey welfare measures into understandable product information.**Credit hours:** 2**Contact hours:** Lecture: 2 Contact: 2**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 4203 Rangeland and Pasture Utilization****Description:** Investigation of livestock and forage interactions that impact productivity in the utilization of rangeland and improved pastures. Same course as NREM 4603. May not be used for Degree Credit with ANSI 5203.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4213 Advances in Meat Science****Prerequisites:** ANSI 3333 or FDSC 3333.**Description:** Development of muscle and its transformation to meat. Properties of meat and their influence on water-binding, pigment formation, texture and fiber characteristics. Same course as FDSC 4213.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 4333 Processed Meat****Prerequisites:** ANSI 3033 or ANSI 3333.**Description:** Meat and meat product composition. Techniques in the molding and forming of meat; sausage formulation; curing; quality control; and cost analysis. Same course as FDSC 4333. May not be used for Degree Credit with ANSI 5833.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4423 Horse Science****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Current concepts and production principles related to the horse industry including nutrition, reproduction, herd health, functional anatomy and implications, social behavior, and applying principles of psychology in horse management and training.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4523 Pet and Companion Animal Management****Prerequisites:** ANSI 1124.**Description:** Current concepts, management principles related to pet and companion animal species and their roles in society. Discussion of the human-animal bond, service animals, kennel and cattery management, anatomy, internal and external parasites, toxins, restraint and handling, reproduction, nutrition, genetics, and breeding. Previously offered as ANSI 3523.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 4543 Dairy Cattle Science****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Current concepts and production principles of the dairy cattle industry including value of milk products, milk marketing, physiology of lactation, reproduction, nutrition, mastitis, and housing. Analysis and active learning of dairy production systems using farm visits and field techniques laboratories. May not be used for Degree Credit with ANSI 5543.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4553 Sheep Science****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Breeding, feeding, management, and marketing of commercial and purebred sheep. May not be used for degree credit with ANSI 5653.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4613 Beef Cow-Calf Management****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Application of farm and ranch land procurement and management principles with beef cattle acquisition, breeding, nutrition, reproduction, health, life cycle management, marketing, and economic analysis of the commercial cow-calf enterprise. Same course as ANSI 4612. May not be used for Degree Credit with ANSI 5813.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4633 Stocker and Feedlot Cattle Management****Prerequisites:** ANSI 3612, ANSI 3653.**Description:** Application of scientific knowledge, management principles, and research advances to modern stocker and feedlot cattle operations. Same course as ANSI 4632. May not be used for Degree Credit with ANSI 5633.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences

**ANSI 4643 Swine Science****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Application of genetic, physiological, microbiological, nutritional, and engineering principles to the efficient production of swine. May not be used for Degree Credit with ANSI 5643.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4703 Equine Enterprise Management****Prerequisites:** ANSI 3433 and ANSI 3443 and ANSI 3653.**Description:** Principles of equine enterprise management including ethical and legal issues, marketing, facility management, business structures, economic analysis and careers. May not be used for Degree Credit with ANSI 5703.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 4713 Beef Seedstock Management and Sales****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Principles of beef cattle seedstock acquisition, breeding, nutrition, reproduction, health, life cycle management and economic analysis. Special emphasis on advertising, promotion, marketing and sales. Course previously offered as ANSI 4632.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4803 Animal Growth and Performance****Prerequisites:** An upper-division course in animal science.**Description:** Physiological and endocrine factors affecting growth and performance of domestic animals. May not be used for Degree Credit with ANSI 5803.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 4823 Animal Genomics****Prerequisites:** ANSI 3423 or equivalent.**Description:** Introduction to analyzing genomes of common livestock species. Understanding the theory of next generation sequencing methods, and how these are applied in the field of livestock genomics, genome resequencing, analysis of genomic variant data, annotating a genome sequence using transcriptomics and proteomics and epigenomics. An introduction to assigning function to genes and genomic regions, exposure to the principles in molecular, comparative and evolutionary genetics/genomics and the application of these principles to livestock genomics.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 4843 Applications of Biotechnology in Animal Science****Prerequisites:** ANSI 3423 and BIOC 3653.**Description:** Training in current biotechniques used in protein, hormone, and molecular genetic research in food and animal science. Theory and applications of the various techniques.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4863 Capstone for Animal Agriculture****Prerequisites:** Senior standing.**Description:** Examination of the role of animal agriculture in society and the importance of research and current issues. Oral and written reports.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Undergraduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 4900 Special Problems****Prerequisites:** Consent of instructor.**Description:** A detailed study of an assigned problem by a student wishing additional information on a special topic. Offered for variable credit, 1-6 credits, maximum of 6 credit hours.**Credit hours:** 1-6**Contact hours:** Contact: 1-6 Other: 1-6**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 4910 Animal Industry Internship****Prerequisites:** Consent of instructor.**Description:** Full-time internship at an approved production, processing or agribusiness unit or other agency serving animal agriculture. Maximum credit requires a six-month internship in addition to a report and final examination. Graded on a pass-fail basis. May not be used for degree credit with ANSI 5910. Offered for variable credit, 1-12 credit hours, maximum of 12 credit hours.**Credit hours:** 1-12**Contact hours:** Contact: 1-12 Other: 1-12**Levels:** Undergraduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 4913 Animal Waste Management****Prerequisites:** SOIL 2124.**Description:** Aspects of animal waste management related to animal nutrition, system design, land application, socioeconomic issues and environmental impacts. Same course as SOIL 4913, ENVR 4913. May not be used for Degree Credit with ANSI 5913.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences

**ANSI 4973 Rangeland Resources Planning****Prerequisites:** NREM 3613.**Description:** Inventory or ranch resources, survey and evaluation of ranch practices, and economic analysis. Development of a comprehensive ranch management plan. Managing rangeland and ranch resources in a social context. Written and oral reports. Field trips required. Same course as NREM 4613.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Undergraduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5000 Master's Research and Thesis****Prerequisites:** MS degree.**Description:** Independent research planned, conducted, and reported in consultation with a major professor. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.**Credit hours:** 1-6**Contact hours:** Contact: 1-6 Other: 1-6**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 5010 Special Problems****Description:** Special problems in areas of animal science other than those covered by the individual graduate student as a part of his/her research and thesis program. Offered for variable credit, 1-3 credit hours, maximum of 6 credit hours.**Credit hours:** 1-3**Contact hours:** Contact: 1-3 Other: 1-3**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 5102 Ethics and Professionalism in Animal and Food Science****Description:** Discussion of regulations, laws, and resources; insights on complex ethical issues, including but not limited to research misconduct, how to address, report and find resources during cases of misconduct, conflicts of interest, and authorship; communication of research and accurately and objectively to different audiences. Same course as FDSC 5102.**Credit hours:** 2**Contact hours:** Lecture: 2 Contact: 2**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5110 Seminar****Description:** A critical review and study of the literature; written and oral reports and discussion on select subjects. Same course as ANSI 6110. Offered for 1 credit hour, maximum of 3 credit hours.**Credit hours:** 1**Contact hours:** Contact: 1 Other: 1**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 5113 Basic Reproductive Physiology****Prerequisites:** ANSI 3443 or equivalent.**Description:** Female and male reproductive processes, endocrine control of reproductive functions, and the application of reproductive physiology to animal production.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5123 Functional and Molecular Endocrinology****Prerequisites:** An upper division physiology course.**Description:** Endocrine regulation of growth, stress, metabolism, and reproduction in domestic farm animals including commercial applications. Focus on the influence of hormones at the systemic and cellular level.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5203 Rangeland and Pasture Utilization****Prerequisites:** NREM 3613.**Description:** Investigation of livestock and forage interactions that impact productivity in the utilization of rangeland and improved pastures. May not be used for Degree Credit with ANSI 4203.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5213 Advances in Meat Science****Prerequisites:** ANSI 3333 or FDSC 3333.**Description:** Development of muscle and its transformation to meat. Properties of meat and their influence on water-binding, pigment formation, texture and fiber characteristics. Same course as FDSC 5213.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5303 Advanced Animal Breeding****Prerequisites:** ANSI 3433 or equivalent and STAT 4013.**Description:** Basic concepts of population genetics as related to theoretical animal breeding, including heritability, genetic correlations, selection methods, inbreeding and heterosis.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences



**ANSI 5313 Marker Assisted Selection in Livestock****Prerequisites:** ANSI 3433 or equivalent and STAT 4013.**Description:** Use of molecular genetics information to capture variation of quantitative traits in farm animals and to enhance selection improvement programs. Discussion of current DNA based technologies, such as detecting, locating and measuring effects of quantitative trait loci (QTL), genetic markers, gene mapping methods and whole genome selection. Examination of emerging genomics technologies.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5333 Carcass Value Estimation Systems****Prerequisites:** Graduate classification.**Description:** Analysis of scientific literature regarding carcass composition, quality and palatability. Overview of technology used to evaluate carcass quality factors. Same course as FDSC 5333.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5423 Animal Stress and Environmental Physiology****Description:** Interrelationship between the stress axis and other biological systems that can impact health and well-being of animals. General concepts of stress physiology, brain mechanisms, cellular pathways, and intercommunication of physiology, behavior, immunology, growth and development, reproduction/lactation, health, and disease.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5433 Meat Science****Description:** Anatomical and basic chemical and physical characteristics of meat animals studied. The application of scientific principles to the processing and economical utilization of meat animals, as well as in the manufacture of meat products emphasized in the laboratory. May not be used for degree credit with ANSI 3333 and FDSC 3333.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5543 Dairy Cattle Science****Prerequisites:** ANSI 3433, ANSI 3443 and ANSI 3653.**Description:** Current concepts and production principles of the dairy cattle industry including value of milk products, milk marketing, physiology of lactation, reproduction, nutrition, mastitis, and housing. Analysis and active learning of dairy production systems using farm visits and field techniques laboratories. May not be used for degree credit with ANSI 4543.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 3 Contact: 5**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5553 Interpreting Animal and Food Science Research****Prerequisites:** STAT 5013 or concurrent enrollment.**Description:** Critical evaluation and knowledgeable communication on the design, analyses, and reporting of animal science and food science research. Same course as FDSC 5553.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5573 Techniques in Animal Molecular Biology****Prerequisites:** BIOC 4113.**Description:** Principles of major basic animal molecular biology techniques in gene cloning and expression. Hands-on experience with basic molecular biology techniques, including DNA cloning and quantitative measurement of mRNA and protein expression in eukaryotic cells.**Credit hours:** 3**Contact hours:** Lecture: 1 Lab: 4 Contact: 5**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5613 Advanced Beef Production****Description:** Beef cattle breeding, nutrition, reproduction, health and disease prevention, life cycle management of the calf crop, as well as marketing alternatives for the producer. Farm and Ranch acquisition, management, including the stocker and/or feedlot phase.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5623 Livestock Behavior and Environmental Interaction****Description:** Integrated approach to animal behavior and animal-environment interactions as it relates to health, productivity, and overall well-being to food animals. Concepts related to practical ways to improve housing accommodations, management strategies for animals that improve animal and human well-being use of behavior to assess the adaptability of animals in their environments. ANSI 5623 was used to denote Exp Methods Animal Res prior to Fall 1995. May not be used for degree credit with ANSI 3623.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5633 Stocker and Feedlot Cattle Management****Prerequisites:** ANSI 3653.**Description:** Application of scientific knowledge, management principles, and research advances to modern stocker and feedlot cattle operations. May not be used for degree credit with ANSI 4633.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences

**ANSI 5643 Swine Science****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Application of genetic, physiological, microbiological, nutritional, and engineering principles to the efficient production of swine. May not be used for degree credit with ANSI 4643.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5653 Sheep Science****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Breeding, feeding, management, and marketing of commercial and purebred sheep. May not be used for degree credit with ANSI 4553.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5703 Equine Enterprise Management****Prerequisites:** ANSI 3433 and ANSI 3443 and ANSI 3653.**Description:** Principles of equine enterprise management including ethical and legal issues, marketing, facility management, business structures, economic analysis and careers. May not be used for degree credit with ANSI 4703.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5733 Advanced Ruminant Nutrition****Prerequisites:** ANSI 3653.**Description:** Factors influencing nutrient requirements of ruminants for maintenance, growth, reproduction and lactation, and their implications with regard to husbandry practices and nutritional management of livestock. Application of current concepts of ruminant livestock nutrition; use of microcomputer programs in diet evaluation and formulation, beef gain simulation and problem solving.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5743 Rumenology****Prerequisites:** ANSI 3653 or equivalent.**Description:** Physiology of development of the ruminant digestive tract; the nature of, and factors controlling digestion and absorption from the tract to include the relative nature and roles of the rumen bacteria and protozoa. Same course as ANSI 5743.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5753 Animal Nutrition Techniques and Laboratory Methods****Prerequisites:** CHEM 3015 or equivalent.**Description:** Collection, handling, and processing of biological materials. Record keeping, pipetting, preparation of reagents, and conducting routine nutritional analysis. Theory of operation of major laboratory equipment. Application of current techniques to problem solving in animal nutrition research.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5763 Advanced Nonruminant Nutrition****Prerequisites:** BIOC 3653.**Description:** An in-depth study of the digestion, absorption, and metabolism of nutrients in nonruminant domesticated farm animals. Unique metabolic characteristics of nonruminant species contrasted with ruminant animals. Fundamentals of energetics as related to animal performance. Same course as ANSI 5762.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5773 Protein Nutrition****Prerequisites:** BIOC 3653.**Description:** Nutritional, biochemical and clinical aspects of protein metabolism as it relates to nutritional status. Same course as ANSI 5772.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5783 Vitamin and Mineral Nutrition****Prerequisites:** BIOC 5753.**Description:** Development of the concept of dietary essential minerals and vitamins. Individual minerals and vitamins discussed for animal species from the standpoint of chemical form, availability, requirements, biochemical systems, deficiencies and excesses and estimation in foods and feed. Same course as ANSI 5782.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5803 Animal Growth and Performance****Prerequisites:** An upper-division course in animal science.**Description:** Physiological and endocrine factors affecting growth and performance of domestic animals. May not be used for degree credit with ANSI 4803.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences

**ANSI 5813 Beef Cow-Calf Management****Prerequisites:** ANSI 3423 and ANSI 3543.**Description:** Application of farm and ranch land procurement and management principles with beef cattle acquisition, breeding, nutrition, reproduction, health, life cycle management, marketing, and economic analysis of the commercial cow-calf enterprise. May not be used for Degree Credit with ANSI 4613.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5823 Animal Genomics****Prerequisites:** ANSI 3423 or equivalent.**Description:** Introduction to analyzing genomes of common livestock species. Understanding the theory of next generation sequencing methods, and how these are applied in the field of livestock genomics, genome resequencing, analysis of genomic variant data, annotating a genome sequence using transcriptomics and proteomics and epigenomics. An introduction to assigning function to genes and genomic regions, exposure to the principles in molecular, comparative and evolutionary genetics/genomics and the application of these principles to livestock genomics. Same course as ANSI 4823.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 5833 Processed Meat****Prerequisites:** ANSI 3033 or ANSI 3333.**Description:** Meat and meat product composition. Techniques in the molding and forming of meat; sausage formulation; curing; quality control; and cost analysis. May not be used for degree credit with ANSI 4333.**Credit hours:** 3**Contact hours:** Lecture: 2 Lab: 2 Contact: 4**Levels:** Graduate**Schedule types:** Lab, Lecture, Combined lecture and lab**Department/School:** Animal & Food Sciences**ANSI 5910 Animal Industry Internship****Prerequisites:** Consent of instructor.**Description:** Full-time internship at an approved production, processing or agribusiness unit or other agency serving animal agriculture. Maximum credit requires a six-month internship in addition to a report and final examination. Graded on a pass-fail basis. May not be used for degree credit with ANSI 4910. Offered for variable credit, 1-12 credit hours, maximum of 12 credit hours.**Credit hours:** 1-12**Contact hours:** Contact: 1-12 Other: 1-12**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 5913 Animal Waste Management****Prerequisites:** SOIL 2124.**Description:** Aspects of animal waste management related to animal nutrition, system design, land application, socioeconomic issues and environmental impacts. May not be used for degree credit with ANSI 4913.**Credit hours:** 3**Contact hours:** Lecture: 3 Contact: 3**Levels:** Graduate**Schedule types:** Lecture**Department/School:** Animal & Food Sciences**ANSI 6000 Doctoral Research and Dissertation****Prerequisites:** MS degree.**Description:** Independent research planned, conducted and reported in consultation with, and under the direction of, a major professor. Open only to students continuing beyond the level of the MS degree. Offered for variable credit, 1-10 credit hours, maximum of 30 credit hours.**Credit hours:** 1-10**Contact hours:** Contact: 1-10 Other: 1-10**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 6010 Special Topics in Animal Breeding****Prerequisites:** Consent of instructor.**Description:** Advanced topics and new developments in animal breeding and population genetics. Offered for variable credit, 1-3 credit hours, maximum of 3 credit hours.**Credit hours:** 1-3**Contact hours:** Contact: 1-3 Other: 1-3**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences**ANSI 6110 Seminar****Description:** A critical analysis of the objectives and methods of research in the area of animal science. Review of the literature, written and oral reports and discussion on select topics. Same course as ANSI 5110. Offered for variable credit, 1-6 credit hours, maximum of 6 credit hours.**Credit hours:** 1-6**Contact hours:** Contact: 1-6 Other: 1-6**Levels:** Graduate**Schedule types:** Independent Study**Department/School:** Animal & Food Sciences

## Undergraduate Programs

- Animal Science: Business/Pre-Law, BSAG (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/business-pre-law-bsag/>)
- Animal Science: General Option, BSAG (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/animal-science-bsag/>)
- Animal Science: Pre-Veterinary/Pre-Medical, BSAG (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/pre-veterinary-pre-medical-bsag/>)
- Animal Science: Production and Operations, BSAG (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/production-operations-bsag/>)
- Food Science, BSAG (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/food-science-bsag/>)

## Graduate Programs

The Department of Animal and Food Sciences offers programs leading to the Doctor of Philosophy and Master of Science degrees in Animal Science and contributes to the interdepartmental Food Science graduate program. Research areas of emphasis are available in breeding (quantitative and molecular genetics), behavior, nutrition, grazing, management, immunology, reproduction, physiology, biotechnology, and meat science.

## Prerequisites

Admission to the Animal Science graduate program requires an undergraduate major in Animal Science or a related field (such as Dairy Science, Poultry Science, Biology, Biochemistry, etc.). In addition, students with a major in Dairy Manufacturing, Microbiology, Human Nutrition, Food Science or Food Technology can qualify for the Food Science program. To be admitted, prospective students must have an agreement from an Animal and Food Sciences faculty member to serve as their graduate advisor. In all cases, the student's graduate advisor or committee may identify specific undergraduate deficiencies and require measures to attain proficiency.

## Certificates

- Equine Enterprise Management, UCRT (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/equine-enterprise-management-ucrt/>)
- Food Safety, UCRT (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/food-safety-ucrt/>)

## Minors

- Animal Science (ANSI), Minor (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/animal-science-minor/>)
- Food Science (FDSC), Minor (<http://catalog.okstate.edu/ferguson-college-agriculture/animal-food-sciences/food-science-minor/>)

## Faculty

Richard Coffey, PhD—Professor and Head

**Professors:** Paul Beck, PhD; Udaya DeSilva, PhD; Gerald Q. Fitch, PhD; Mark Z. Johnson, PhD; David L. Lalman, PhD; Gretchen Mafi, PhD; Peter Muriana, PhD; Ranjith Ramanathan, PhD; Ryan Reuter, PhD; Guolong Zhang, PhD

**Associate Professors:** Scott Carter, PhD; Steven Cooper, PhD; Ravi Jadeja, PhD; Darren Hagen, PhD; Kris Hiney, PhD; Janeen Salak-Johnson, PhD; Adele Pezeschki, PhD; Dan Stein, PhD; Blake Wilson, PhD

**Assistant Professors:** Andrew Foote, PhD; Mellissa Crosswhite, PhD; Parker Henley, PhD; Khursheed Iqbal, PhD; João Moraes, PhD; Morgan Pfeiffer, PhD

**Teaching Instructors:** Meaghan Meyer, PhD; Jason White, MS

**Senior Extension Specialist:** Barry Whitworth, PhD, DVM

**Assistant Extension Specialist:** Justin Crosswhite, MS