Department of Animal Science

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Master of Science in Animal Science

This degree is intended for those who have completed a Bachelor of Science degree in animal science, agricultural, or natural resource related fields. Those with an undergraduate degree in an unrelated field may be considered for admission with approval of a faculty mentor within the department. Undergraduate leveling courses may be required.

Acceptance into the program requires acceptance into the College of Graduate Studies, a minimum of 3.0 undergraduate GPA, and acceptance by a graduate faculty mentor within the department. Conditional acceptance may be granted for students with a GPA less than 3.0 but greater than 2.7. Once accepted, students must maintain a GPA of 3.0 or higher to remain in good standing. For assistance in identifying a faculty mentor and for a required departmental application, contact the Department of Animal Science.

There are two available options within the Master of Science in Animal Science: the research (thesis) track, and professional (non-thesis) track. Both tracks require the student to acquire a graduate faculty committee for advice and guidance through the completion of the MS degree. Both tracks require 36 graduate credit hours. Students in the thesis option will conduct original research and take 6 hours of thesis credit. Students in the professional option will design, implement and complete an independent project and take 6 hours of applied project credits. All students will take an additional 30 hours of coursework, which is flexible to allow the student to meet their individual needs within a subject area and animal species. At the completion of their graduate coursework and project (thesis or applied project), students must complete an oral comprehensive exam and a defense of their project.

Master of Science in Animal Science Program Requirements

ANSC 5185	Animal Science Seminar (Three semesters required for a total of 3 SCH) [1]	3
Total Hours		**3**

[1] ANSC 5185 is one credit hour. Students will take this course three times for a total of three credit hours.

Master of Agriculture in Animal Production

This degree program is designed for individuals who have completed a Bachelor of Science in animal science, agriculture, or related natural resource fields. Through graduate-level coursework and hands-on field experience, students will gain advanced knowledge and specialized skills in their chosen area of emphasis, positioning them to be highly competitive within the animal industry.

Acceptance into the program requires acceptance into the College of Graduate Studies, with a minimum of 2.7 undergraduate GPA.

Students enrolled in the Master of Agriculture program are required to complete 25 credit hours of coursework, with emphasis in a concentration area aligned with their interests. In addition, students must complete a 6-credit-hour internship with a department-approved organization. Upon completion of all coursework and internship requirements, students are expected to successfully pass either the American Registry of Professional Animal Scientists (ARPAS) Exam or the American Meat Science Association (AMSA) Meat Certification Exam.

Master of Agriculture in Animal Production Program Requirements

Program Requirements [1]		
ANSC 5185	Animal Science Seminar	1
Internship Requirement		6
ANSC 5399	Internship	
ANSC 5318	Ethical/Environmental Issues in Animal Agriculture	3
ACRS 5396	Analysis of Social Research Data	3
ACRS 5331	Professional Communication	3
Any 5000-Level ANSC, BIOL, RNRM, AGEC, ACRS Course		6
Total Hours		**22**

[1] Students will also have to pass the ARPAS exam or AMSA Meat Certification exam before the degree is awarded.

Meat Science

Choose 9 Credit Hours from the Following		9
ANSC 5310	Muscle Chemistry, Ultrastructure, and Physiology	
ANSC 5314	Food Quality Assurance	
ANSC 5316	Grant Writing and Funding Aquisition	
ANSC 5338	Value-Added Processed Meats	
Total Hours		**9**

Nutrition

Choose 9 Credit Hours from the Following		9
ANSC 5324	Advanced Equine Nutrition	
ANSC 5303	Rumen Microbiology	
ANSC 5304	Ruminant Nutrition	
ANSC 5350	Laboratory Methods in Animal Research	
ANSC 5356	Non-Ruminant Nutrition	
ANSC 5365	Minerals and Vitamins in Animal Nutrition	
RNRM 5301	Advanced Grazing Management	
Total Hours		**9**

Physiology and Welfare

Choose 9 Credit Hours from the Following		9
ANSC 5308	Measuring Animal Behavior	
ANSC 5309	Animal Welfare Assessments and Audits	
ANSC 5310	Muscle Chemistry, Ultrastructure, and Physiology	
ANSC 5312	Domestic Animal Endocrinology	
ANSC 5316	Grant Writing and Funding Aquisition	
ANSC 5325	Equine Exercise Physiology	
ANSC 5328	Environmental Physiology of Farm Animals	
ANSC 5355	Animal Metabolism	
Total Hours		**9**

Reproduction

Choose 9 Credit Hours from the Following		9
ANSC 5306	Assisted Breeding Technology	
ANSC 5316	Grant Writing and Funding Aquisition	
ANSC 5312	Domestic Animal Endocrinology	
ANSC 5300	Advanced Equine Reproduction	
ANSC 5326	Advanced Physiology of Reproduction	
Total Hours		**9**

Graduate Faculty

- Contreras-Correa, Zully Dr.
- Guay, Kimberly Dr.
- Jones, Trinette Dr.
- Lambert, Barry Dr.
- Leatherwood, Jessica Dr.
- Martinez, Rafael Dr.
- Owsley, Frank Dr.
- Rosiere, Randall Dr.
- Runyan, Cheyenne Dr.
- Webb, Edward Dr.
- Wellmann, Kimberly Dr.

Courses

ANSC 5048. Animal Science Applied Project. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).
Design, implement, and complete an independent project; integrate the knowledge and skills learned in the program; advance the application of scientific principles. Written report and oral communication of the results.

ANSC 5086. Animal Science Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).
Advanced studies in animal science problems and procedures. Problems assigned according to experience, interest, and needs of individual student.

ANSC 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).
Scheduled when the student is ready to complete the thesis. No credit until the thesis is completed. Prerequisite: Approved research methodology course and approval of the instructor of record.

ANSC 5090. Special Topics in Animal Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).
Selected topics in Animal Sciences offered as needed and dependant upon departmental, faculty, and student interests. May be repeated as topics vary. Instructor approval required prior to registration.

ANSC 5175. Journal Club: Topics in Animal Science. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).
Perform critical evaluation of scientific writing and published works, assess the quality of the results, and become familiar with the publication process. This course is intended to provide a multi-specie discussion relevant to animal sciences research. Credit cannot be awarded for both ARSC 6175 and ANSC 5175.

ANSC 5185. Animal Science Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).
Graduate seminar with content varying according to student and curricular needs. May be repeated for a total of three credit hours. Prerequisite: Graduate classification.

ANSC 5300. Advanced Equine Reproduction. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).
Through a comprehensive exploration of current research in equine reproductive health, stallion fertility, mare cyclicity, and pregnancy, students will gain a profound understanding of the physiological processes governing reproduction in horses. Emphasis is placed on bridging the gap between theory and practice, while mastering common assistive breeding technologies, offering students a holistic perspective on equine reproductive science. Credit cannot be awarded for both ARSC 6300 and ANSC 5300.

ANSC 5301. Experimental Design in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Common and anomalous designs encountered in conduct of research in the agricultural and environmental sciences. Proper analysis of these designs and common pitfalls in experimental design. Students are expected to enter with a cursory knowledge of introductory statistics.

ANSC 5302. Forage Biology and Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Biology of forage growth, metabolic pathways of the plant, and physiological response to stressors that contribute to pasture management. Credit will not be awarded for both ANRS 6332 and ANSC 5302.

ANSC 5303. Rumen Microbiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Scientific and practical evaluation of the rumen microbiome, with emphasis on functional classes and substrate preferences, and its impact on animal nutrition and performance. Credit will not be awarded for both ANRS 6303 and ANSC 5303.

ANSC 5304. Ruminant Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Survey of current knowledge and concepts in ruminant physiology and biochemistry, their literature and experimental basis and relation to current and future practice and investigation. Credit will not be awarded for both ANRS 6334 and ANSC 5304. Prerequisites: A course in Animal Nutrition and graduate classification.

ANSC 5306. Assisted Breeding Technology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Reproductive principles and techniques in modern breeding programs for farm livestock and other species. Prerequisites: Graduate Standing.

ANSC 5308. Measuring Animal Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
An advanced course in the principles and methods of quantitative studies of behavior, with an emphasis on techniques of observation, recording, and analysis. Credit will not be awarded for ANRS 6308, ANSC 5308, and WSES 5308.

ANSC 5309. Animal Welfare Assessments and Audits. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Basic components of animal welfare assessments, review of current industry assessment tools and animal welfare audits. Credit will not be awarded for both ANRS 6339 and ANSC 5309. Prerequisite: Graduate status.

ANSC 5310. Muscle Chemistry, Ultrastructure, and Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
A study of muscle development, structure, composition, growth, mechanisms of contraction, and rigor as related to livestock and meat production. Prerequisite: Graduate standing.

ANSC 5311. Data Management & Analysis in Animal Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Data collection practices, organization, and modification in various computer programs suited to the experimental designs used in animal science. Methods of data entry into statistical software, coding, and appropriate analyses. Students are expected to enter with a cursory knowledge of introductory statistics. Prerequisite: Graduate classification and previous coursework in statistics.

ANSC 5312. Domestic Animal Endocrinology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
The study of cell communication through endocrine, autocrine, paracrine, and neuroendocrine secretions. Detailed physiological and biochemical composition of hormones with special reference to domestic animal species. Students who successfully complete this course cannot receive credit for ARSC 6312. Prerequisite: Graduate student standing.

ANSC 5314. Food Quality Assurance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
The basis behind food quality control/assurance is discussed along with its application to various food systems to control and improve the quality and safety of our food supply. Credit will not be awarded for ANSC 4341 and ANSC 5314. Lab fee: $2.

ANSC 5315. Animal Growth and Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
A study of the processes related to animal growth. Emphasis on cellular changes allowing for muscle, bone and adipose tissue growth as well as the role and functions of hormones related to development and age-related adaptation. Composition of muscle, bone, and adipose tissue in market animals will be discussed. Credit will not be awarded for ANRS 6325 and ANSC 5315. Prerequisites: A course in General Animal Science and approval of instructor.

ANSC 5316. Grant Writing and Funding Aquisition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
A course in terminology and processes associated with grant writing and the acquisitions of research funds.

ANSC 5317. Advanced Livestock Production. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Overview of beef, dairy, swine, small ruminant and poultry production systems and their applications. Modern concepts, ideas, and methodology associated with the application of technology to reproduction, breeding, health, nutrition and nutrient utilization, across various management schemes. Prerequisite: Graduate student classification.

ANSC 5318. Ethical/Environmental Issues in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Ethical and environmental issues affecting public policy as related to agrieducation/industry/business. Credit for both ANSC 5218 and AGCR 5318 will not be awarded. Prerequisites: Approval of instructor.

ANSC 5319. Biotechnology in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
A study of modern biotechnology in agriculture today. This course will explore important advancements and tools in fields such as genetics, agronomy, and bioinformatics. It will also examine the legal constraints and ethical debates that surround these technologies. Credit will not be awarded for both ANSC 4319 and ANSC 5319.

ANSC 5324. Advanced Equine Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Principles of digestive physiology and nutrition unique to equine species; integration of scientific principles into feeding management systems of horses; review and evaluation of current research in equine nutrition. Credit cannot be awarded for both ARSC 6354 and ANSC 5324. Prerequisite: Graduate standing; previous coursework in nutrition.

ANSC 5325. Equine Exercise Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Studies of the influence of training and conditioning on muscle physiology, cardiovascular physiology, the biomechanics of locomotion, and energy utilization. Fundamental rehabilitation and treatment of sports injuries. Students can not receive credit for both ANSC 3325 and ANSC 5325. Prerequisite: Instructor approval.

ANSC 5326. Advanced Physiology of Reproduction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
A study of physiology of reproduction with focus on historical and current research in reproductive neuroendocrinology, male fertility, female cyclicity, and pregnancy. This course will discuss research in rodent models, rabbits, sheep, cattle, pigs, and primates. Students who successfully complete this course cannot receive credit for ARSC 6326. Prerequisite: ANSC 5312.

ANSC 5328. Environmental Physiology of Farm Animals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Environmental influence on biological rhythms; body temperature regulation; heat sources and conserving mechanisms; feed intake, behavior, growth and development and reproduction in farm animals. Credit given for only ANSC 5328 OR ANSC 4308. Prerequisite: Graduate classification.

ANSC 5338. Value-Added Processed Meats. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
The application of scientific principles and practices to further processed meat products. Interrelationships among tissue characteristics, ingredients, handling practices, processing technologies and storage conditions as they affect the quality, safety, and stability of muscle foods.

ANSC 5350. Laboratory Methods in Animal Research. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Skill development in laboratory techniques and analysis related to animal science research. Application of live animal data collection. Introduction to institutional animal care and use protocols and ethical use of animals in research. Prerequisites: Graduate standing; instructor approval. Lab fee: $2.

ANSC 5355. Animal Metabolism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
The course is structured to provide an overview of various regulatory mechanisms of metabolism and changes due to exercise, stress, pregnancy, nutrient imbalance, disease and toxic effects. Credit will not be awarded for both ANRS 6345 and ANSC 5355. Prerequisites: Graduate standing; 3 hours of animal or human nutrition AND 3 hours of anatomy and physiology OR department head approval.

ANSC 5356. Non-Ruminant Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Advanced course in nutritional science focusing in advanced topics in intergrated nutrient metabolism; advanced digestive physiology, nutritional requirements and nutritional imbalances and subsequent disease states in non-ruminant animals. Prior coursework in metabolism or biochemistry is recommended. Credit will not be awarded for both ANRS 6356 and ANSC 5356. Prerequisite: ANSC 5355.

ANSC 5360. Lactation Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Systematic overview of lactation physiology using dairy cattle as the main model. Course topics will include mammary gland anatomy, milk secretion, mammary gland development and disease impacts. Credit will not be awarded for both ANRS 6361 and ANSC 5360. Prerequisites: Graduate standing.

ANSC 5365. Minerals and Vitamins in Animal Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
An in-depth study of vitamin and mineral chemistry, metabolism, interrelationships, and requirements for production in livestock animals. Prerequisite: Graduate standing.

ANSC 5380. Research and Writing for Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Preparation of writing samples, technical reviews, and/or professional manuscripts related to various topics in agriculture. Prerequisites: Approved research methodology course and approval of instructor of record.

ANSC 5399. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 8 Hours).
Prepared and supervised work experience in an Animal Science-related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of the student's graduate committee. Field experience fee $50.