
Animal Science (ANSC)

Head of Department: Professor Steven Zinn

Department Office: Room 107, George White Building (Animal Science)

For major requirements, see the College of Agriculture, Health and Natural Resources section of this *Catalog*.

For 2-year program course listing, refer to Ratcliffe Hicks School of Agriculture (SAAS).

1001. Introduction to Animal Science

~~(120)~~ Three credits. Two class periods and one 2-hour discussion or laboratory period. Taught concurrently with SAAS 101. *Darre*

The biological, physical, and social factors that influence animal production and utilization.

1111. Principles of Animal Nutrition and Feeding

Three credits. Two class periods and one 2-hour discussion and laboratory period. Taught concurrently with SAAS 113. Not open for credit to students who have passed ANSC 2111. *Safran*

Digestive anatomy of various species and the classes of nutrients including their digestion, metabolism and sources. Nutrient requirements and feeding standards for livestock, companion animals, exotics and aquatics for purposes of reproduction, lactation, growth, work and maintenance. Classes of feedstuffs, their characteristics, proper utilization, formulating rations and nutritional programs for animal enterprise.

1602. Behavior and Training of Domestic Animals

~~(125)~~ Three credits. Two class periods and one 2-hour laboratory. Taught concurrently with SAAS 202. *Darre*

Application of behavior of cattle, horses, sheep, goats, swine and poultry to their management, training and welfare. Basic principles of genetics and physiology of behavior, perception, training, learning, motivation, and stress with consideration of integrated behavioral management and animal welfare.

1645. The Science of Food

~~(160)~~ (Also offered as NUSC 1645.) Three credits. *Mancini*

An introductory level course for students interested in the application of science to food. Nutritional and functional attributes of various food constituents are discussed. Issues concerning food processing and food safety are covered. CA 3.

1676. Introduction to Companion Animals

~~(127)~~ Three credits. Taught concurrently with SAAS 276. ~~Prereq:~~ *Safran*

Basic concepts of the nutrition, physiology, health and management of companion animals.

1693. Foreign Studies in Animal Science

~~(193)~~ Variable credits (1-15). Hours by arrangement. Prerequisite: Open only by instructor consent. May be repeated for credit.

Variable topics.

1695. Special Topics Lecture

~~(195)~~ Credits, prerequisites, and hours as determined by the Senate Curricula and Courses Committee. May be repeated for credit with a change in topic.

2251. Horse Science

~~(235)~~ Three credits. Two class periods and one 2-hour laboratory or discussion period. Taught concurrently with SAAS 251. *Nadeau*

Valuable to animal science majors. Includes horse types and breeds and their nutrition, breeding, evaluation, behavior, care and management with attention given to detailed studies of the problems and practices of horse production and use.

2271. Principles of Poultry Science

~~(254)~~ Three credits. Two class periods and one 2-hour laboratory period. *Darre*

The application of the basic scientific principles to the management of poultry, egg and meat production systems.

Field trips are required.

2690. Animal Science Field Excursions

~~(294)~~ One credit. Prerequisite: Open only with instructor consent. May be repeated for credit with a change of topic. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

A multiple day field trip format. Students in this course will travel with the instructor to visit and tour agri-businesses that represent commercial aspects of different animal science activities. Students will interview agri-business personnel and gain an understanding of how agricultural principles are applied in the field. Each student must submit a formal written report for evaluation and meet all other course requirements as specified by the instructor. Field trip is required.

2695. Special Topics

~~(298)~~ Credits and hours by arrangement. Prerequisite: Open only with instructor consent. May be repeated for credit with a change of topic. [Contact Department Main Office for list of current topics and instructors.](#)

2699. Independent Study

~~(299)~~ Credits and hours by arrangement of instructor. Prerequisite: Instructor consent required. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory). May be repeated for credit.

3121. Principles of Animal Genetics

~~(217)~~ Three credits. Prerequisite: BIOL ~~1107~~ 1108; open to ~~juniors-sophomores~~ or higher. Recommended preparation: BIOL ~~1108~~ 1107. [Safra Magee](#)

Principles of Mendelian and molecular genetics. Biosynthesis and function of DNA, RNA, and protein. This course also includes introductions to population and quantitative genetics. Information on molecular methods of genetic analysis and examples of genetics in animals of agricultural significance are also provided.

3122. Reproductive Physiology

~~(219)~~ Four credits. Three class periods and one 2-hour laboratory period. *Milvae*

A study of the reproductive anatomy and physiology of domestic animals. Laboratory will include macro and micro anatomy, hormone action, and techniques used in reproductive management of domestic animals. A fee of \$75 is charged for this course.

3194. Seminar

~~(295)~~ One credit. One 2-hour discussion period. Prerequisite: Open to sophomores or higher. *Govoni*

A discussion of current employment opportunities in animal agriculture. In addition, students will prepare resumes and make oral presentation.

3261. Dairy Cattle Management

~~(275)~~ Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Open to juniors or higher. Taught concurrently with SAAS 261. *Kazmer*

Management of dairy cattle including milking procedures, sanitation, selection, nutrition, reproduction, physiology and anatomy of milk secretion and record keeping. Field trips required.

3272. Laboratory Animal Science

~~(269)~~ Three credits. Two class periods and one 2-hour laboratory or discussion period. Prerequisite: BIOL 1107. Recommended preparation: BIOL 1108 or equivalent. *Milvae*

Principles and practices of laboratory animal care and management in relation to animal characteristics, handling and restraint, animal house design, reproduction and nutrition and legal regulations. Various laboratory animal techniques will be covered. A \$75 fee is charged for this course.

3273. Livestock Management

~~(273)~~ Four credits. Three class periods and one 2-hour laboratory period. Taught jointly with SAAS 273. *Hoagland*

The production and management of beef cattle, sheep, and swine. Laboratories involve theory and practice in livestock management, skills, and techniques.

3311. Comparative Exercise Physiology

Three credits. Two class periods and one 2-hour lab/discussion period. Prerequisite: PVS 2100 or PNB 2265 or 2275; open to juniors or higher. *Reed*

A comparative study of the effects of exercise on the body, focusing on the three primary athletic species (canine,

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equine, human). Particular emphasis will be placed on the physiological mechanisms which allow for adaptation to exercise and inactivity. Discussion/lab periods will focus on critical review of current scientific literature and hands on activities.

3312W. Scientific Writing in Comparative Exercise Physiology

One credit. One class period. Prerequisite: ENGL 1010 or 1011 or 2011; open to juniors or higher. Corequisite: ANSC 3311. *Reed*

A writing intensive class integrated with course content in ANSC 3311.

3313. Growth Biology and Metabolism in Domestic Livestock

~~(222)~~ Three credits. Two class periods and one 2-hour discussion period. Prerequisite: Open to juniors or higher. Recommended preparation: PVS 2100. *Govoni*

Focuses on the embryonic and postnatal growth and development of domestic livestock with emphasis on metabolic and hormonal regulation of processes that influence growth and development. Discussion period will focus on methods used to measure growth and metabolism.

3314W. Scientific Writing in Growth Biology and Metabolism of Domestic Livestock

~~(223W)~~ One credit. Prerequisite: ENGL 1010 or 1011 or 2011; open to juniors or higher. Corequisite: ANSC 3313. *Govoni*

A writing intensive class integrated with course content in ANSC 3313.

3316. Endocrinology of Farm Animals

Three credits. Two class periods. Prerequisite: Open to juniors or higher. Recommended preparation: PVS 2100 or equivalent. *Zinn*

Focuses on endocrine systems and endocrine function in farm animals with emphasis on hormones involved in metabolism, growth, lactation, feed intake and digestion in cattle, pigs, horses and poultry.

3317W. Scientific Writing in Endocrinology of Farm Animals

One credit. One class period. Prerequisite: ENGL 1010 or 1011 or 2011; open to juniors or higher. Corequisite: ANSC 3316. *Zinn*

A writing intensive class integrated with course content in ANSC 3316.

3323. Animal Embryology and Biotechnology

~~(229)~~ Three credits. Prerequisite: Open to juniors or higher. Recommended preparation: ANSC 3122 or MCB 4219. *Tian*

Introduction to recent research in animal embryology and related reproductive biotechnologies. Basic principles, methodology and state of the technology for numerous established and emerging animal biotechnologies such as transgenesis and cloning.

3324W. Scientific Writing in Embryo Biotechnology

One credit. One class period. Prerequisite: ENGL 1010, or 1011, or 2011; open to juniors or higher. Corequisite: ANSC 3323. *Tian*

A writing intensive class integrated with course content in ANSC 3323.

3343. Animal Food Products

~~(253)~~ Three credits. Two class periods and one 3-hour laboratory. Prerequisite: Open to juniors or higher. *Mancini*

A study of the food products derived from animal agriculture, including dairy, meat, poultry and fish. Emphasis will be placed on inspection, grading, processing, biochemistry, nutritive value and food safety concerns of these products. A fee of \$50 is charged for this course.

3344W. Scientific Writing in Animal Food Products

~~(255W)~~ One credit. Prerequisite: ENGL 1010 or 1011 or 2011; open to juniors or higher. Corequisite: ANSC 3343. *Mancini*

A writing intensive class integrated with course content in ANSC 3343.

3452. Horse Breeding Farm Management

~~(238)~~ Three credits. One class period and two 2-hour laboratory or discussion periods. Prerequisite: ANSC 2251; open to juniors or higher. *Reed*

Designed to develop technical and managerial skills necessary for operating horse breeding farms. Programs for herd

health, hoof care, nutrition, breeding, foaling, and record keeping will be included.

3453. Pleasure Horse Appreciation and Use

~~(234)~~ One credit. One 1-hour lecture and one 1-hour laboratory. Not open to students who have passed ANSC 3456. *Meacham*

Open to all University students interested in pleasure horses. The principles of horse management and horsemanship. A \$75 fee is charged for this course.

3454. Horse Selection and Evaluation

~~(281)~~ Two credits. One 4-hour laboratory or discussion period. Taught concurrently with SAAS 254. Prerequisite: Consent of instructor is required. Not open for credit to graduate students. *Bennett*

Comparative evaluation, classification and selection of horses according to conformation, breed characteristics and performance. Judging skills including justification of placings through presentation of oral reasons will be developed. The Intercollegiate Horse Judging Team may be selected from this course. Field trips are required.

3455. Developing the Driving Horse

~~(231)~~ Two credits. One 1-hour lecture and two 1-hour laboratories. Prerequisite: Open to juniors or higher; open by consent only. *Bennett*

Techniques related to training the driving horse will be described. Prior working experience with horses is recommended.

3456. Light Horse Training and Management

~~(236)~~ Two credits. Three 1-hour laboratories and one 1-hour lecture period. Prerequisite: ANSC 2251; open only with consent of instructor. *Bennett, Meacham*

The theory, fundamentals and practice of breaking, training, fitting, showing, and the use of horses for riding. Primarily for Animal Science majors.

3621. Animal Biotechnology Laboratory

Two credits. One class period and one 3-hour laboratory period. Prerequisite: ANSC 3121 (or equivalent); PLSC 3210 or AH 3020 (or equivalent); instructor consent required. Recommended preparation: ANSC 3122 (or equivalent). *Tian*

Laboratory techniques used in agricultural biotechnology research, including embryo manipulation, immunofluorescence, real-time PCR, karyotyping, SNP analysis, high throughput sequencing, RNA-seq, genome construction, and gene database searches.

3641. Animal Food Products: Dairy Technology

~~(252)~~ Three credits. ~~Two class periods and one 2-hour laboratory or discussion period.~~ Prerequisite: Open to juniors or higher. *D'Amico*

~~The study of milk and milk products from a food science perspective including production and processing, the chemical, physical and microbiological components, the technological aspects of the transformation of milk into various food products, public health regulations, good manufacturing practices, cleaning and sanitizing procedures, unit operations in dairy food manufacturing, packaging, labeling and quality control procedures.~~ Production and processing of milk and milk-products from a food science perspective including chemical, physical and microbiological components. Technological aspects of the transformation of milk into various food products. Public health regulations, good manufacturing practices, cleaning and sanitizing procedures. Unit operations in dairy food manufacturing, packaging, labeling and quality control procedures.

3642W. Scientific Writing in Animal Food Products: Dairy Technology

~~(256W)~~ One credit. Prerequisite: ENGL 1010 or 1011 or 2011. Corequisite: ANSC 3641. *D'Amico*

A writing intensive course integrated with course content in ANSC 3641.

3663. Dairy Management Decision-making

~~(278)~~ One credit. One 2-hour discussion period. Prerequisite: Open to juniors or higher; consent of instructor required. May be repeated twice for credit. *Kazmer*

Participation in all phases of dairy herd management including decision-making activities, with particular emphasis on impact of decisions on financial health and stability. Course requires participation beyond specific semester calendars.

3664. Dairy Cattle Evaluation

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~~(284)~~ One credit. One 2-hour laboratory or discussion period. Prerequisite: Open to juniors or higher. *Kazmer*

An introduction to the evaluation of dairy cattle on the basis of conformation. Breed classification and type improvement programs, score card criteria in relation to longevity, physiological efficiency and performance are included. Attention is also given to fitting and showing methods. Field trips may be required.

3674. Livestock and Carcass Evaluation

~~(283)~~ Two credits. Two 2-hour laboratory periods. Taught concurrently with SAAS 274. Not open for credit to graduate students. *Hoagland*

Classification, form to function relationships, grades and value differences of livestock are included. Objective and subjective methods of appraisal are used to evaluate beef cattle, horses, sheep and swine.

3675. Advanced Animal and Product Evaluation

~~(288)~~ One credit. One 2-hour laboratory or discussion period. Prerequisite: Open to juniors or higher; open only with instructor consent. Taught concurrently with SAAS 275. Not open for credit to graduate students. May be repeated once for credit.

Intensive training in the evaluation of selected species of farm animals or their products. Type standards and the relation of anatomical features to physiological function are emphasized. Evaluation skills including justification of decisions will be developed. Intercollegiate dairy cattle, horse, livestock, poultry judging teams will be selected from this course. Field trips are required, some of which may occur prior to the start of the semester.

3691. Professional Internship

~~(296)~~ Credits and hours by arrangement. Prerequisite: Open only to juniors and seniors with instructor consent. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory). *Andrew, Darre, Milvae*

3693. Foreign Studies in Animal Science

~~(293)~~ Variable credits, 1-15. Hours by arrangement. Prerequisite: Open only by instructor consent. May be repeated for credit.

Variable topics.

3695. Special Topics

Credits and hours by arrangement. Prerequisite: Open only by instructor consent. May be repeated for credit with a change of topic. Contact Department Main Office for list of current topics and instructors.

4311. Advanced Animal Nutrition

Three credits. Two class periods and one 2-hour lab/discussion period. Prerequisite: ANSC 1111; open to juniors or higher.

A comparative study of nutritional, physiological, microbiological, immunological and biochemical aspects of digestion and metabolism in the non-ruminant and ruminant animal, particularly livestock and companion animals. Topics include digestive system structures, utilization of nutrients, energy metabolism, control of nutrient metabolism, and experimental techniques used in the study of animal nutrition.

4312W. Scientific Writing in Advanced Animal Nutrition

One credit. One class period. Prerequisite: ENGL 1010 or 1011 or 2011; open to juniors or higher. Corequisite ANSC 4311.

A writing-intensive class integrated with course content in ANSC 4311.

4341. Food Microbiology and Safety

~~(224)~~ Three credits. Prerequisite: BIOL 1107; open to juniors or higher. A one semester course in organic chemistry is recommended. *Venkitanarayanan*

Current topics in food safety will be discussed, with special emphasis on microbial and chemical contamination of food. Specific topics including the safety of natural versus synthetic chemicals, food additives, irradiation and other practices, basic microbiology and toxicology, current regulatory practices and risk assessment will also be included. The Hazard Analysis Critical Control Points (HACCP) approach to food safety will be discussed.

4342W. Scientific Writing in Food Microbiology and Safety

One credit. One class period. Prerequisite: ENGL 1010 or 1011 or 2011; open to juniors or higher. Corequisite: ANSC 4341. *Venkitanarayanan*

A writing-intensive class integrated with course content in ANSC 4341.

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4457. Methods of Equitation Instruction

~~(237)~~ Two credits. One class period and one 2-hour laboratory or discussion period. Taught concurrently with SAAS 257. Prerequisite: Consent of instructor required; Intermediate II or above riding experience required. *Meacham*

The techniques and procedures of teaching equitation including the theories of riding and teaching methods. Practice teaching will be required under the supervision of the instructor.

4642. Food Microbiology Laboratory

~~(227)~~ One credit. One 3-hour laboratory session. Prerequisite: Open to juniors or higher. Recommended preparation: MCB 2610. *Venkitanarayanan*

An introductory laboratory course in sampling of foods for microbiological analysis, enumeration of microorganisms in foods, and isolation and identification of major foodborne pathogens from foods.

4662W. Dairy Herd Management

~~(277WC)~~ Three credits. Two class periods and one 2-hour laboratory period. Taught concurrently with SAAS 262. Prerequisite: ANSC 3261; ENGL 1010 or 1011 or 2011; open to juniors or higher. *Kazmer*

Dairy farm management practices with emphasis on business and economic decision making. The effects of various programs in selection, nutrition, facilities, reproduction and herd health on overall business health will be evaluated. Each student will manage a computer simulated herd during the semester. Field trips are required.

4697W. Undergraduate Honors Thesis Writing in Animal Science

~~(297W)~~ One credit. Hours by arrangement. Prerequisite: Three credits of ANSC, 2699 or 5692, either of which may be taken concurrently; ENGL 1010 or 1011 or 2011; open to juniors or higher; open only with consent of instructor.

Writing of a formal thesis based on independent research conducted by the student. Thesis proposal and final thesis must follow guidelines developed by the department.

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