

ANIMAL SCIENCES

ANS 5446 Animal Nutrition 3 Credits

Grading Scheme: Letter Grade

Carbohydrates, fats, proteins, minerals, and vitamins and their functions in the animal body. Offered fall term.

Prerequisite: ANS 3440, BCH 4024, or consent of instructor.

ANS 5935 Reproductive Biology Seminar and Research Studies 1 Credit, Max 4 Credits

Grading Scheme: S/U

Invited speakers on a wide range of topics. Student-faculty participation in research projects.

Prerequisite: ANS 3319C or equivalent.

ANS 6040 Concepts in Applied Ethology 3 Credits

Grading Scheme: Letter Grade

Introduces concepts and methods used to conduct research in the field of applied ethology. Course content includes an overview of mechanisms of animal behavior and approaches to measuring and modeling animal behavior. The focus is on developing skills necessary to conduct, analyze, and interpret research in applied ethology.

Prerequisite: CALS major

ANS 6288 Experimental Techniques and Analytical Procedures in Meat Research 3 Credits

Grading Scheme: Letter Grade

Experimental design, analytical procedures; techniques; carcass measurements and analyses as related to livestock production and meats studies. Offered spring term in even-numbered years.

ANS 6312C Applied Ruminant Reproductive Management 4 Credits

Grading Scheme: Letter Grade

In-depth review of applied bovine reproductive management; factors that affect the efficiency of reproduction (managerial, biological, and economical). Offered fall term.

Prerequisite: ANS 3319C

ANS 6313 Current Concepts in Reproductive Biology 2 Credits

Grading Scheme: Letter Grade

Lectures prepared by students and discussion of current review articles. Offered spring term in odd-numbered years.

Prerequisite: ANS 3319C or equivalent; consent of instructor.

ANS 6379L Techniques Genetics 2 Credits

Grading Scheme: Letter Grade

Techniques Genetics

ANS 6387 Genetic Analysis of Complex Traits in Livestock 3 Credits

Grading Scheme: Letter Grade

Comprehensive examination of principles of livestock inheritance, QTL mapping strategies and functional genomic approaches used for genomic selection and improvement programs in farm animals.

ANS 6447 Ruminant Nutrition 4 Credits

Grading Scheme: Letter Grade

The anatomy and physiology of the ruminant digestive system as well as the digestion and metabolism of dietary nutrients for the purposes of growth, pregnancy, and lactation. Ration formulations using computer software.

Prerequisite: ANS 5446: Animal Nutrition

ANS 6449 Vitamins 3 Credits

Grading Scheme: Letter Grade

Historical development, properties, assays, and physiological effects.

Prerequisite: organic chemistry.

ANS 6452 Principles of Forage Quality Evaluation 3 Credits

Grading Scheme: Letter Grade

Definition of forage quality in terms of animal performance, methodology used in forage evaluation, and proper interpretation of forage evaluation data. Offered spring term in even-numbered years.

Prerequisite: ANS 5446, AGR 4231C.

ANS 6458 Advanced Methods in Nutrition Technology 3 Credits

Grading Scheme: Letter Grade

Demonstrations and limited performance of procedures used in nutrition research. Offered fall term in even-numbered years.

Prerequisite: for graduate students but open to seniors by special permission.

ANS 6636 Meat Technology 3 Credits

Grading Scheme: Letter Grade

Chemistry, physics, histology, bacteriology, and engineering involved in the handling, processing, manufacturing, preservation, storage, distribution, and utilization of meat. Offered fall term in odd-numbered years.

ANS 6637 Quantitative Microbial Risk Assessment of Pathogens in Food Systems 3 Credits

Grading Scheme: Letter Grade

Modeling principles of microbial risk assessment in food chains. Model implementation in stochastic simulation software (R). Focus is on the bottom-up food chain approach and basic principles of the top-down approach.

Prerequisite: STA 6166 or similar statistics course & knowledge of the R programming environment.

ANS 6702 Physiology of the Mammary Gland and Lactation 2 Credits

Grading Scheme: Letter Grade

Offers insights into the endocrinology and physiology of the defining characteristics of mammals: the mammary gland and lactation, focusing on the anatomy and development of the mammary gland with an overview of the biochemical, cellular and molecular processes controlling lactation emphasizing on livestock species.

Prerequisite: ANS 6704 or permission of instructor

ANS 6704 Mammalian Endocrinology 2 Credits

Grading Scheme: Letter Grade

Physiologic systems of farm animals. Emphasizes the impact of endocrinology and cell biology on animal physiology, development and performance.

Prerequisite: BCH 4024 or BCH 3025, or equivalent.

ANS 6705 Muscle Physiology 1 Credit

Grading Scheme: Letter Grade

Overview of morphological, physiological, cellular, and molecular factors affecting muscle structure and function, with special emphasis on mammalian skeletal muscle.

Prerequisite: Undergraduate coursework in biology, biochemistry, and physiology.

ANS 6707 Growth Physiology in Farm Animals 1 Credit

Grading Scheme: Letter Grade

Biological regulation of muscle, cartilage and bone formation and function in farm animals with integration of physiological systems to livestock tissue growth.

Prerequisite: ANS 6704

ANS 6711 Current Topics in Equine Nutrition and Exercise Physiology 2 Credits**Grading Scheme:** Letter Grade

Equine science with emphasis on current topics of interest. Offered fall term in odd-numbered years.

ANS 6714 Current Topics in Microbial Physiology in Animals 1 Credit**Grading Scheme:** Letter Grade

Insights into microbial pathogenesis, microbial genetics, and molecular microbiology with particular reference to livestock species.

ANS 6715 Gastrointestinal and Feed Microbiology 3 Credits**Grading Scheme:** Letter Grade

Microbiology of the rumen, hindgut, and feed; relation to livestock production and food safety.

Prerequisite: ANS 5446.**ANS 6716 Physiology in Farm Animals 1 Credit****Grading Scheme:** Letter Grade

Physiology and function of the gastrointestinal system in monogastrics and ruminants.

Prerequisite: ANS 6704**ANS 6718 Nutritional Physiology of Domestic Animals 2 Credits****Grading Scheme:** Letter Grade

Physiological, biochemical and molecular control of nutritional processes in monogastrics and ruminants.

Prerequisite: ANS 5446; introductory biochemistry course.**ANS 6723 Mineral Nutrition and Metabolism 3 Credits****Grading Scheme:** Letter Grade

Physiological effect of macro- and micro-elements, and mineral interrelationships.

ANS 6750 Reproductive Physiology in Farm Animals 1 Credit**Grading Scheme:** Letter Grade

Physiology and function of the reproductive system in farm animals.

Prerequisite: ANS 6704 and ANS 3319C or equivalent.**ANS 6751 Physiology of Reproduction 3 Credits****Grading Scheme:** Letter Grade

Conceptual relationship of the hypothalamus, pituitary, and reproductive organs during the estrous cycle and pregnancy. Influence of exteroceptive factors and seasonal reproduction. Offered fall term in even-numbered years.

Prerequisite: BCH 5045 or equivalent.**ANS 6767 Advanced Endocrinology 3 Credits****Grading Scheme:** Letter Grade

Overview of mammalian endocrine systems and molecular basis of hormone action; Current topics on endocrine control of growth, development, reproduction and nutrition.

Prerequisite: BCH4024 or BCH 5045; ANS 6704 ; or equivalent, or consent of instructor.**ANS 6775 Essentials of Livestock Immunology 1 Credit****Grading Scheme:** Letter Grade

Basic immunological concepts and their relation to immunity for livestock and other species.

ANS 6905 Problems in Animal Science 1-4 Credits, Max 8 Credits**Grading Scheme:** Letter Grade

Problems in Animal Science

ANS 6910 Supervised Research 1-5 Credits, Max 5 Credits**Grading Scheme:** S/U

Supervised Research

ANS 6932 Special Topics in Animal Science 1-3 Credits, Max 9 Credits**Grading Scheme:** Letter Grade

New developments in animal nutrition and livestock feeding, animal genetics, animal physiology, and livestock management.

ANS 6933 Graduate Seminar in Animal Science 1 Credit, Max 8 Credits**Grading Scheme:** Letter Grade

Graduate Seminar in Animal Science

ANS 6936 Graduate Seminar in Animal Molecular and Cell Biology 1-2 Credits**Grading Scheme:** Letter Grade

Seminar attendance and 1-hour presentation on graduate research project.

ANS 6939 Animal Molecular and Cellular Biology Journal Colloquy 1 Credit, Max 5 Credits**Grading Scheme:** S/U

Critical evaluation, presentation and discussion of recent scientific journal articles on a specified topic in cellular and/or molecular biology.

ANS 6940 Supervised Teaching 1-5 Credits, Max 5 Credits**Grading Scheme:** Letter Grade

Helping students develop teaching skills in the animal sciences under the guidance of faculty member.

ANS 6942 Supervised Extension in the Animal Sciences 1-3 Credits**Grading Scheme:** Letter Grade

Develops extension skills in the Animal Sciences under the guidance of faculty member.

ANS 6971 Research for Master's Thesis 1-15 Credits**Grading Scheme:** S/U

Research for Master's Thesis

ANS 7979 Advanced Research 1-12 Credits**Grading Scheme:** S/U

Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy.

ANS 7980 Research for Doctoral Dissertation 1-15 Credits**Grading Scheme:** S/U

Research for Doctoral Dissertation

PCB 6816 Thermal Physiology 1 Credit**Grading Scheme:** Letter Grade

Exploring the processes by which homeotherms produce heat and regulate its exchange with the environment, and the consequences of thermal biology for animal production.