ANSC410 The Gut Microbiome and its Roles in Health and Disease (3 Credits)
A comprehensive perspective of the role of gut microbiome/microflora in nutrition, metabolism, disease prevention and health issues including farm animal health and food value, and human gastrointestinal health and immunity.
Prerequisite: BSCI223, ANSC212, ANSC327, EPIB301, BSCI222, BSCI421, or NFSC430; or students who have taken courses with comparable content may contact the department.
Credit Only Granted for: ANSC489M or ANSC410.
Formerly: ANSC489M.

ANSC420 Critical Thinking in Animal Science (3 Credits)
Employ methods to systematically solve selected problems that typically arise on farms or allied businesses related to animal enterprises.
Prerequisite: ANSC314.
Recommended: AREC306 and AREC250.
Restriction: Junior standing or higher.

ANSC435 Experimental Embryology (3 Credits)
Experimental approaches to mammalian embryology with emphasis on domestic livestock systems as applied to research and production systems. Lab will include hands-on experiments and demos of in vitro embryo production, embryo splitting, cell injection and nuclear transfer.
Prerequisite: ANSC212.
Recommended: Completion of one course in reproductive physiology is recommended.
Credit Only Granted for: ANSC435 or ANSC489M.
Formerly: ANSC489M.

ANSC437 Animal Biotechnology (3 Credits)
Key concepts and current issues in animal biotechnology are covered. Current techniques and applications systems as well as social, ethical, and regulatory issues associated with biotechnology will be discussed.
Prerequisite: ANSC327; or students who have taken courses with comparable content may contact the department.

ANSC440 Zoonotic Diseases and Control (3 Credits)
Global perspective of foodborne diseases common to animals and man, specifically those caused by farm animal-originated human pathogens (zoonoses) and their control. A selection of important zoonoses and food safety issues will be specifically covered with an emphasis on the principles of zoonotic disease transmission and control, risk factors to humans, and surveillance methods.
Prerequisite: BSCI223, ANSC212, ANSC327, BSCI222, BSCI421, or NFSC430; or students who have taken courses with comparable content may contact the department.
Credit Only Granted for: ANSC440 or ANSC489R.
Formerly: ANSC489R.

ANSC443 Physiology of Lactation (3 Credits)
A comprehensive survey of lactation in laboratory and domestic animals. Other species are discussed where possible. Emphasis will be placed on physiological aspects of milk synthesis and secretion and on the cellular and molecular biology of mammary gland development.
Prerequisite: CHEM231, ANSC212, and CHEM232.
Recommended: BCHM463.

ANSC444 Domestic Animal Endocrinology (3 Credits)
Current developments in endocrinology as it relates to animals used in the production of food and other products important to the well being of humans will be covered.
Prerequisite: ANSC212; or permission of instructor.
Restriction: Must not have completed ANSC644.
Credit Only Granted for: ANSC489I, ANSC444, or ANSC644.
Formerly: ANSC489I.

ANSC446 Physiology of Mammalian Reproduction (3 Credits)
Anatomy and physiology of reproductive processes in domesticated and wild mammals.
Prerequisite: ANSC212 or BSCI440.

ANSC447 Physiology of Mammalian Reproduction Laboratory (1 Credit)
Gross and micro-anatomy, artificial insemination, estrous cycle synchronization and invitro-fertilization procedures and analytical techniques useful in animal management and reproduction.
Prerequisite: Must have completed or be concurrently enrolled in ANSC446.

ANSC450 Animal Breeding Plans (3 Credits)
Design of animal breeding programs for the genetic improvement of livestock and companion animal species. Principles of population and quantitative genetics. Genetic evaluations of animals, selection strategies and crossbreeding systems. Incorporation of statistics and biotechnology into animal breeding plans.
Prerequisite: 1 course with a minimum grade of C- from (MATH120, MATH130, MATH136, MATH140).
Restriction: Junior standing or higher.

ANSC452 Avian Physiology (3 Credits)
The digestive, excretory, respiratory, circulatory, immune, skeletal muscle, endocrine and nervous systems of avian species will be examined.
Prerequisite: ANSC212.

ANSC453 Animal Welfare and Bioethics (3 Credits)
Ethical concerns related to the use of animals in modern society. Historical and philosophical overview of animal welfare and bioethics. Applied ethical discussions on human/animal interrelationships, physical and genetic manipulation, and other current issues associated with the treatment of animals used in food production, research, zoos, and as pets.
Prerequisite: ANSC101 and ANSC103; or BSCI110; or (BSCI110 and BSCI116); or permission of instructor.
Restriction: Junior standing or higher.

ANSC455 Applied Animal Behavior (3 Credits)
Principles of animal behavior applied to production systems in animal agriculture.
Prerequisite: ANSC101 and ANSC103; or BSCI110; or (BSCI110 and BSCI116).
ANSC460 Comparative Vertebrate Immunology (3 Credits)
Basic concepts in immunology, and comparing immunity in different vertebrates, including organization of immune systems, innate and adaptive immune responses. Special attention will be paid to how cell-mediated and humoral immune responses are induced in natural infections, and what are the effector mechanisms in both of these processes. Immune response in representative disease models such as infections with viruses and bacteria, cancer, and autoimmune disease will be discussed. Lectures concerning cutting-edge research will also be given.
Prerequisite: ANSC212, BSCI201, or BSCI440.
Credit Only Granted for: ANSC460 or ANSC489I.
Formerly: ANSC489I.

ANSC489 Current Topics in Animal Science (1-3 Credits)
Examination of current developments in the animal sciences.
Repeatable to: 6 credits if content differs.

ANSC497 Animal Biotechnology Recombinant DNA Laboratory (3 Credits)
An advanced course offering hands-on experience in performing recombinant DNA experiments. Current molecular biology techniques used for cloning genes, analyzing the gene products, and modifying the genes of animals will be performed. Techniques include isolation of DNA, use of restriction enzymes; cloning procedures, PCR analysis, and Southern hybridizations. Lecture material focuses on interpretation of results generated in the laboratory.
Prerequisite: ANSC327; or students who have taken courses with comparable content may contact the department.
Recommended: ANSC437 and ANSC435.

ANSC627 Molecular and Quantitative Genetics (3 Credits)
Classical, molecular, and population genetics with specific emphasis on animal systems will be covered. Also, disseminate information on molecular approaches for manipulating genetics at the whole animal level (transgenic and cloning). Other model organisms will be discussed to provide a conceptual framework.

ANSC644 Molecular and Cellular Endocrinology (3 Credits)
A comprehensive course covering the major endocrine systems in animals. Lecture topics include major endocrine axes, hormonal regulation of homeostasis, growth and reproduction, and endocrine mechanisms of action. Advanced concepts in the molecular and cell biology of hormone action and regulation addressed in weekly discussion sessions centered on current research publications in the field of molecular and cellular endocrinology.
Restriction: Must not have completed ANSC444.
Credit Only Granted for: ANSC444, ANSC489I, ANSC644, or ANSC688I.
Formerly: ANSC688I.

ANSC660 Poultry Literature (1-4 Credits)
Readings on individual topics are assigned. Written reports required. Methods of analysis and presentation of scientific material are discussed.

ANSC688 Special Topics (1-4 Credits)
Lectures, experimental courses, and other special subjects in the fields of animal sciences and veterinary medicine.
Repeatable to: 4 credits.

ANSC698 Seminar (1 Credit)
Students are required to prepare papers based upon current scientific publications relating to animal science, or upon their research work, for presentation before and discussion by the class; (1) recent advances; (2) nutrition; (3) physiology; (4) biochemistry.