

ANIMAL AND VETERINARY SCIENCE (AVS)

AVS 1090 The Science of Animals that Serve Humanity (4 credits)

Role of animal agriculture in providing food, work, and pleasure for mankind; intro to animal genetics, physiology, endocrinology, nutrition, and other disciplines essential for an understanding of the contributions of animals in the expanding human population.

AVS 1100 Science of Animal Husbandry (3 credits)

Fundamental concepts of animal husbandry and its foundation in the science of animal production; introduction to the technical subject matter of animal production. Typically Offered: Spring.

AVS 1100L Science of Animal Husbandry Lab (1 credit)

Laboratory to support teaching in AVS 1100; introductory applications of fundamentals of animal science to domestic animal management and production. One 2-hr lab a week. Typically Offered: Spring. Prereqs or Coreqs: AVS 1100

AVS 2040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

AVS 2220 Animal Reproduction and Breeding (3 credits)

Provides fundamental information about reproduction, lactation, and breeding of domestic animals; topics include functional anatomy, basic physiology, and endocrinology relating to reproduction and lactation; animal breeding involves the mathematical and conceptual framework of genetic evaluation.

AVS 2630 Live Animal and Carcass Evaluation (3 credits)

Evaluation and selection of cattle, sheep, and swine for herd replacement; evaluation of market animals; carcass evaluation and grading, slaughter procedures, and factors that affect quality and quantity of meat; visual and objective appraisals. One lecture and two 3-hour lab per week; four 1-day and four 1/2-day field trips or equivalent time. Cooperative: open to WSU degree-seeking students.

AVS 2670 Anatomy and Physiology of Domestic Animals (3 credits)

Study of domestic animal anatomy and physiology from a systems perspective. Two lectures and one 2-hour lab per week. Recommended preparation: BIOL 1150 and 1150L. Typically Offered: Fall.

Prereqs: AVS 1090 or AVS 1100

AVS 2680 Companion Animal Diseases (2 credits)

Principles of disease resistance, transmission, and prevention; clinical signs, pathogenesis, and control of major diseases in companion animals. Recommended preparation: AVS 2220 or equivalent.

Prereqs: AVS 1090

AVS 2720 Principles and Practices of Dairy Science (2 credits)

An overview of the dairy industry and the science of producing milk and reproduction, udder health and mastitis, milk marketing, and dairy product quality and safety; approved management practices for dairy enterprise. Typically Offered: Fall.

Prereqs: AVS 1090 or AVS 1100

AVS 2740 Beef Feedlot Systems (2 credits)

Overview of feeding management, feed milling and batching, animal health, and economics of the commercial cattle feeding business.

Prereqs: AVS 1090

Coreqs: AVS 1100

AVS 2980 (s) Internship (1-16 credits, max 99)

Credit arranged

AVS 2990 (s) Directed Study (1-6 credits, max 6)

Graded Pass/Fail.

Prereqs: Permission of department

AVS 3010 Undergraduate Research in Animal Science (1-3 credits, max 6)

Undergraduate research related to animal and veterinary science. Graded Pass/Fail.

AVS 3050 Animal Nutrition (4 credits)

Introduction of the concepts and principles of animal nutrition; fundamentals of nutrients and their digestion and metabolism; various biochemical pathways and processes for nutrient utilization; nutrition fundamentals for a range of monogastric and ruminant animals. Recommended Preparation: BIOL 1150 and BIOL 1150L, and CHEM 1111 and CHEM 1111L, or CHEM 1101 and 1101L, and CHEM 2750 or CHEM 2770. Typically Offered: Fall.

Prereqs: AVS 1090

AVS 3060 Feeds & Ration Formulation (3 credits)

Application of principles of nutrition to ration formulation for poultry and livestock; evaluating feedstuffs for use in ration formulation. AVS majors must also take AVS 3060L. Typically Offered: Spring.

Prereqs: AVS 3050 Cooperative: open to WSU degree-seeking students.

AVS 3060L Feeds and Ration Formulation Laboratory (1 credit)

Laboratory to support instruction in AVS 3060; Application of ration formulation for poultry and livestock as it applies to the principles of animal nutrition; evaluation of feedstuffs for use in ration formulation. One 2-hour lab per week. Co-requisite for AVS majors: AVS 3060. Recommended Preparation: AVS 3050. Typically Offered: Spring.

AVS 3170 Artificial Insemination and Pregnancy Detection (3 credits)

Anatomy and physiology of pregnant and non-pregnant reproductive systems; artificial insemination; male reproduction; pregnancy detection in domestic livestock.

Prereqs: AVS 1090; and AVS 2220 or AVS 4520, Junior/Senior Standing OR instructor permission

AVS 3180 Beef Calving Management (1 credit)

Increase student's knowledge and experience of the biology, physiology and management of cows and calves before, during, and after the birthing process.

Prereqs: AVS 1090 and AVS 1100

AVS 3300 Genetics of Livestock Improvement (3 credits)

Genetic principles applied to breeding of farm animals.

Prereqs: AVS 1090 Cooperative: open to WSU degree-seeking students.

AVS 3630 Animal Products for Human Consumption (4 credits)

Cross-listed with FS 3630

The meat, dairy, and egg industries, including product produced, processed, safety (HACCP), nutrition, distribution, quality, quantity, palatability, health, cooking, home storage, and consumer concerns. Special clothing and equipment required. Three lecture credits and one 3-hour lab per week. Recommended Preparation: BIOL 1150, BIOL 1150L. Cooperative: open to WSU degree-seeking students.

AVS 3710 Anatomy and Physiology (3 credits)

Structure and function of tissues and organ systems of domestic and wild animals.

Prereqs: BIOL 1150, BIOL 1150L

AVS 3730 Anatomy and Physiology Lab (1 credit)

Students will perform dissections and examine the relationship between the organization of tissues and their distinct function within the animal. Field trips may be incorporated should teaching opportunities arise though most instruction will be confined to the physiology and anatomy laboratory and classroom. Typically Offered: Fall.

Prereqs: AVS 1090, BIOL 1150, BIOL 1150L and Animal and Veterinary Science major

Coreqs: AVS 3710

AVS 3980 (s) Internship (1-16 credits, max 99)

Credit arranged. Cooperative programs with producers, allied industry, and food processing industries within the state. Graded Pass/Fail.

Prereqs: Permission

AVS 4040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

AVS 4050 (s) Professional Development (1-16 credits, max 99)

Credit arranged

AVS 4090 Growth Physiology Inquisition (2 credits, max 99)

Joint-listed with AVS 5090

This course will develop skills in critical review of literature in growth physiology. Students will study set journal articles describing original research and present their review to the study group in a team participation format. Active participation of the study group, led by the primary reviewer, is an essential component of the course. Graduate students are encouraged to take the course multiple times (e. g. , each semester). Student performance is evaluated using a six criterion rubric. For undergraduate credit, students are evaluated across 2-3 achievement levels per criterion. For graduate credit, students are evaluated across 4 achievement levels per criterion as shown in the course outline. Recommended Preparation: AVS 4510/AVS 5510.

AVS 4110 Ruminant Nutrition (3 credits)

Joint-listed with AVS 5110

Intro to anatomy of digestive tract of ruminant; focus on ruminal and postruminal carbohydrate, protein, and lipid metabolism; ruminal bacteria, protozoa and fungi, microbe-microbe interactions and their role in nutrients utilization; compartmentation of the rumen and microbial protein synthesis; practical aspects of ruminant nutrition and intro to current feeding systems; research techniques in studying ruminal degradation and digesta kinetics. Additional projects/assignments required for graduate credit. (Alt/yrs)

Prereqs: Permission

AVS 4300 Genetics and Biotechnology (3 credits)

Joint-listed with AVS 5300

Principles of modern and classical genetics. Topics covered include Mendelian genetics, meiosis, mitosis, chromosome rearrangement, DNA structure and replication, mutations, bacterial and phage genetics, gene regulation, transcription, translation, population genetics, biotechnology, molecular and functional genomics. Additional work required for graduate credit. Typically Offered: Spring.

Prereqs: BIOL 1150 and AVS 3300; or Permission

AVS 4500 Issues in Animal Agriculture (2 credits)

General Education: Capstone Experience

The capstone experience for seniors in AVS; students will present information on selected topics and propose solution to current problems; emphasis on problem solving using integration of information across disciplines.

Prereqs: Senior standing

AVS 4510 Endocrine Physiology (3 credits)

Joint-listed with AVS 5510

Structure and physiology of glands of internal secretion and their hormonal effects on processes of growth, development, metabolism, and production of vertebrates; minor emphasis on invertebrates. Completion of term paper required for graduate credit. Recommended Preparation: BIOL 3800. Cooperative: open to WSU degree-seeking students.

AVS 4520 Physiology of Reproduction (4 credits)

Physiology of reproduction; growth, structure, development, endocrinology, and control of reproductive function with emphasis on farm animals. Three lecture and one 2-hour lab a week.

Prereqs: AVS 1090 and BIOL 1150 and BIOL 1150L or equivalent

Cooperative: open to WSU degree-seeking students.

AVS 4630 Growth and Lactation (3 credits)

Joint-listed with AVS 5630

Principles of animal growth and lactation. Hormonal, nutritional, and metabolic control of bone, muscle, adipose, and mammary tissue development; regulation of lactation. Additional work required for graduate credit. Typically Offered: Fall.

Prereqs: AVS 1090 and AVS 2670 or AVS 3710 or BIOL 2227

Coreqs: AVS 3050 Cooperative: open to WSU degree-seeking students

AVS 4660 Equine Science and Management (3 credits)

Study of the industry as well as basic principles of equine science and management, including conformation and selection, anatomy, form to function, nutrition and feeding, behavior, health, reproduction, marketing, facilities and business management. Two lectures and one 2-hour lab per week.

Prereqs: Junior standing and AVS 2220, AVS 3710, and AVS 3050 or Permission Cooperative: open to WSU degree-seeking students.

AVS 4670 Advanced Systems Physiology (4 credits)

Joint-listed with AVS 5670

An advanced study of systems physiology designed to emphasize the interaction between structure and function of specialized cells, tissues, organs, and systems in health and disease in large mammals. The systems to be covered will include, but are not limited to, cardiovascular, respiratory, renal, and endocrine, stressing whole animal metabolism. Additional areas of study may include discussions of membrane electrophysiology, membrane signaling mechanisms, skeletal muscle function, and the pharmacology of therapeutic agents. Additional work required for graduate credit. Typically Offered: Spring.

Prereqs: AVS 2670 or AVS 3710 or BIOL 2227 & BIOL 2228 Cooperative: open to WSU degree-seeking students.

AVS 4710 Animal Disease Management (3 credits)

Principles of immunity and disease resistance, transmission, and prevention; clinical signs, pathogenesis, and control of major diseases of economic importance in domestic animals.

Prereqs: Junior standing

AVS 4720 Dairy Cattle Management (3 credits)

Establishing a dairy farm, housing and managing large dairy herds, selection of breeding cattle, and marketing quality milk. One 4-day field trip. Recommended Preparation: AVS 2220 or equivalent.

Prereqs: AVS 1090

Coreqs: AVS 3050 Cooperative: open to WSU degree-seeking students

AVS 4740 Beef Cattle Science (3 credits)

Breeding, feeding, and management; commercial and purebred enterprises; management of beef cattle on ranges, pasture, and in the feedlot. Two credit hours of lecture and 1 credit hour of lab (2 hour lab) each week. One 1-day field trip. Recommended Preparation: AVS 2220 or equivalent. Typically Offered: Spring.

Prereqs: AVS 3050

AVS 4750 Advanced Dairy Management (3 credits)

Application of concepts of dairy cattle management to practical situations. One lecture and 1-2 hours of lab per week. Recommended Preparation: AVS 4720.

Prereqs: AVS 3050

Coreqs: AVS 3060 or AVS 4110 Cooperative: open to WSU degree-seeking students

AVS 4760 Sheep Science (3 credits)

Application of principles of genetics, reproduction, nutrition, health, and marketing to the management of commercial and purebred sheep; new developments related to sheep industry; production, evaluation, and use of wool. Two lectures and one 2-hour lab per week; one 1-day field trip or equivalent time. Recommended Preparation: AVS 2220 or equivalent.

Prereqs: AVS 1090 Cooperative: open to WSU degree-seeking students.

AVS 4980 (s) Internship (1-16 credits, max 99)

Credit arranged

AVS 4990 (s) Directed Study (1-6 credits, max 99)

Credit arranged.

AVS 5000 Master's Research and Thesis (1-16 credits, max 99)

Credit arranged

AVS 5010 (s) Seminar (1-16 credits, max 99)

Credit arranged

AVS 5020 (s) Directed Study (1-16 credits, max 99)

Credit arranged. Graded Pass/Fail.

Prereqs: Permission

AVS 5030 (s) Workshop (1-16 credits, max 99)

Credit arranged

AVS 5040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

AVS 5050 (s) Professional Development (1-16 credits, max 99)

Credit arranged

AVS 5090 Growth Physiology Inquisition (2 credits, max 99)

Joint-listed with AVS 4090

This course will develop skills in critical review of literature in growth physiology. Students will study set journal articles describing original research and present their review to the study group in a team participation format. Active participation of the study group, led by the primary reviewer, is an essential component of the course. Graduate students are encouraged to take the course multiple times (e. g. , each semester). Student performance is evaluated using a six criterion rubric. For undergraduate credit, students are evaluated across 2-3 achievement levels per criterion. For graduate credit, students are evaluated across 4 achievement levels per criterion as shown in the course outline. Recommended Preparation: AVS 4510/AVS 5510.

AVS 5110 Ruminant Nutrition (3 credits)

Joint-listed with AVS 4110

Intro to anatomy of digestive tract of ruminant; focus on ruminal and post-ruminal carbohydrate, protein, and lipid metabolism; ruminal bacteria, protozoa and fungi, microbe-microbe interactions and their role in nutrients utilization; compartmentation of the rumen and microbial protein synthesis; practical aspects of ruminant nutrition and intro to current feeding systems; research techniques in studying ruminal degradation and digesta kinetics. Additional projects/assignments required for graduate credit. (Alt/yr)

AVS 5170 Macronutrient Metabolism (3 credits)

Upon completion of this class, students will be familiarized with many aspects of digestion, absorption, and metabolism of macronutrients in a detailed level. The emphasis will be on interrelationship and regulation of macronutrients utilization at cellular and organ levels. It is assumed that graduate students have a good knowledge of physiology and biochemistry. Pertinent research manuscripts will be discussed in a round-table fashion.

Prereqs: AVS 3050 or AVS 4110 or similar course

AVS 5300 Genetics and Biotechnology (3 credits)

Joint-listed with AVS 4300

Principles of modern and classical genetics. Topics covered include Mendelian genetics, meiosis, mitosis, chromosome rearrangement, DNA structure and replication, mutations, bacterial and phage genetics, gene regulation, transcription, translation, population genetics, biotechnology, molecular and functional genomics. Additional work required for graduate credit. Typically Offered: Spring.

AVS 5310 Practical Methods in Analyzing Animal Science Experiments (3 credits)

Upon completion of this class, students will be able to manage and analyze data obtained from animal experimentations. This is a "hands-on" type of training, specifically designed for AVS graduate students and intends to provide our graduate students with a better understanding of designs commonly used in animal science experiments, advantages and potential pitfalls associated with each design, data processing and analysis, data tabulation, graphic illustration, and data interpretation.

Prereqs: 4000-level statistics course

AVS 5500 Critical Evaluation of Scientific Research (2 credits)

Students will learn how to critically evaluate scientific literature; develop an understanding of current molecular biology, biotechnology, genomics and/or genetics techniques, and strategies employed in the fields of biology and animal science; and develop scientific writing skills. Graded Pass/Fail.

AVS 5510 Endocrine Physiology (3 credits)

Joint-listed with AVS 4510

Structure and physiology of glands of internal secretion and their hormonal effects on processes of growth, development, metabolism, and production of vertebrates; minor emphasis on invertebrates. Completion of term paper required for graduate credit. Recommended Preparation: BIOL 3800. Cooperative: open to WSU degree-seeking students.

AVS 5550 Environmental Physiology of Livestock (2 credits)

Discusses fundamental and advanced concepts related to physiological interactions of livestock with their environment and adaptation of animals to changing environmental conditions. Course is largely discussion based, with a focus on current topics and research. Typically Offered: Fall.

Prereqs: 2000-level or higher Anatomy & Physiology Cooperative: open to WSU degree-seeking students.

AVS 5630 Growth and Lactation (3 credits)

Joint-listed with AVS 4630

Principles of animal growth and lactation. Hormonal, nutritional, and metabolic control of bone, muscle, adipose, and mammary tissue development; regulation of lactation. Additional work required for graduate credit. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

AVS 5670 Advanced Systems Physiology (4 credits)

Joint-listed with AVS 4670

An advanced study of systems physiology designed to emphasize the interaction between structure and function of specialized cells, tissues, organs, and systems in health and disease in large mammals. The systems to be covered will include, but are not limited to, cardiovascular, respiratory, renal, and endocrine, stressing whole animal metabolism. Additional areas of study may include discussions of membrane electrophysiology, membrane signaling mechanisms, skeletal muscle function, and the pharmacology of therapeutic agents. Additional work required for graduate credit. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

AVS 5970 (s) Practicum (1-16 credits, max 99)

Credit arranged

AVS 5980 (s) Internship (1-16 credits, max 99)

Credit arranged

AVS 5990 (s) Non-thesis Master's Research (1-16 credits, max 99)

Credit arranged

AVS 6000 Doctoral Research and Dissertation (1-45 credits, max 99)

Credit arranged