

# ANIMAL AND VETERINARY SCIENCE (AVS)

## **AVS 109 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 110 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 110L Science of Animal Husbandry Lab (1 credit)**

Laboratory to support teaching in AVS 110; 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 110

## **AVS 172 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.

## **AVS 204 (s) Special Topics (1-16 credits)**

Credit arranged

## **AVS 222 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 263 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 267 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 115 and 115L. Typically Offered: Fall.

**Prereqs:** AVS 109 or AVS 110

## **AVS 268 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 222 or equivalent.

**Prereqs:** AVS 109

## **AVS 274 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 109

**Coreqs:** AVS 110

## **AVS 298 (s) Internship (1-16 credits)**

Credit arranged

## **AVS 299 (s) Directed Study (1-6 credits, max 6)**

Graded P/F.

**Prereqs:** Permission of department

## **AVS 301 Undergraduate Research in Animal Science (1-3 credits, max 6)**

Undergraduate research related to animal and veterinary science. Graded P/F.

## **AVS 305 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 115 and BIOL 115L, and CHEM 111 and CHEM 111L, or CHEM 101 and 101L, and CHEM 275 or CHEM 277. Typically Offered: Fall.

**Prereqs:** AVS 109

## **AVS 306 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 306L. Typically Offered: Spring.

**Prereqs:** AVS 305 Cooperative: open to WSU degree-seeking students.

## **AVS 306L Feeds and Ration Formulation Laboratory (1 credit)**

Laboratory to support instruction in AVS 306; 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 306.

Recommended Preparation: AVS 305. Cooperative: open to WSU degree-seeking students.

## **AVS 317 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 109; and AVS 222 or AVS 452, Junior/Senior Standing OR instructor permission

## **AVS 318 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 109 and AVS 110

## **AVS 330 Genetics of Livestock Improvement (3 credits)**

Genetic principles applied to breeding of farm animals. This is a cooperative course available to WSU degree-seeking students.

**Prereqs:** AVS 109

## **AVS 363 Animal Products for Human Consumption (4 credits)**

Cross-listed with FS 363

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 115, BIOL 115L. Cooperative: open to WSU degree-seeking students.

## **AVS 371 Anatomy and Physiology (3 credits)**

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

**Prereqs:** BIOL 115, BIOL 115L

**AVS 373 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. (Fall only)

**Prereqs:** AVS 109, BIOL 115, BIOL 115L and Animal and Veterinary Science major

**Coreqs:** AVS 371

**AVS 398 (s) Internship (1-16 credits, max arranged)**

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

**Prereqs:** Permission

**AVS 404 (s) Special Topics (1-16 credits)**

Credit arranged

**AVS 405 (s) Professional Development (1-16 credits)**

Credit arranged

**AVS 411 Ruminant Nutrition (3 credits)**

Joint-listed with AVS 511

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/yrs)

**Prereqs:** Permission

**AVS 450 Issues in Animal Agriculture (2 credits)**

General Education: Senior 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 452 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. Cooperative: open to WSU degree-seeking students.

**Prereqs:** AVS 109 and BIOL 115 and BIOL 115L or equivalent

**AVS 463 Growth and Lactation (3 credits)**

Joint-listed with AVS 563

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 109 and AVS 267 or AVS 371 or BIOL 227

**Coreqs:** AVS 305 Cooperative: open to WSU degree-seeking students

**AVS 466 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. Cooperative: open to WSU degree-seeking students.

**Prereqs:** Junior standing and AVS 222, AVS 371 and AVS 305 or Permission

**AVS 471 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 472 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 222 or equivalent. Cooperative: open to WSU degree-seeking students.

**Prereqs:** AVS 109

**Coreqs:** AVS 305

**AVS 474 Beef Cattle Science (3 credits)**

Breeding, feeding, and management; commercial and purebred enterprises; management of beef cattle on ranges, pasture, and in the feedlot. One 1-day field trip. Recommended Preparation: AVS 222 or equivalent. Typically Offered: Spring.

**Prereqs:** AVS 305

**AVS 475 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 472. Cooperative: open to WSU degree-seeking students.

**Prereqs:** AVS 305

**Coreqs:** AVS 306 or AVS 411

**AVS 476 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 222 or equivalent. Cooperative: open to WSU degree-seeking students.

**Prereqs:** AVS 109

**AVS 498 (s) Internship (1-16 credits)**

Credit arranged

**AVS 499 (s) Directed Study (1-6 credits, max arranged)**

**AVS 500 Master's Research and Thesis (1-16 credits)**

Credit arranged

**AVS 501 (s) Seminar (1-16 credits)**

Credit arranged

**AVS 502 (s) Directed Study (1-16 credits)**

Credit arranged Graded P/F.

**Prereqs:** Permission

**AVS 503 (s) Workshop (1-16 credits)**

Credit arranged

**AVS 504 (s) Special Topics (1-16 credits)**

Credit arranged

**AVS 505 (s) Professional Development (1-16 credits)**

Credit arranged

**AVS 509 Growth Physiology Inquisition (2 credits, max 99)**

Joint-listed with AVS 409

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 J451/J551.

**AVS 511 Ruminant Nutrition (3 credits)**

Joint-listed with AVS 411

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/years)

**Prereqs:** Permission

**AVS 517 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 305, or AVS 411, or similar course

**AVS 531 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, and graphic illustration, and data interpretation.

**Prereqs:** 400-level statistics course

**AVS 550 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 P/F.

**AVS 555 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:** 200-level or higher Anatomy & Physiology Cooperative: open to WSU degree-seeking students.

**AVS 563 Growth and Lactation (3 credits)**

Joint-listed with AVS 463

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.

**Coreqs:** AVS 305 Cooperative: open to WSU degree-seeking students

**AVS 597 (s) Practicum (1-16 credits)**

Credit arranged

**AVS 598 (s) Internship (1-16 credits)**

Credit arranged

**AVS 599 (s) Non-thesis Master's Research (1-16 credits)**

Credit arranged

**AVS 600 Doctoral Research and Dissertation (1-45 credits)**

Credit arranged