ANIMAL AND RANGELAND SCIENCES

The multiple facets of Animal Sciences provides current information on the different production methods involved in the care and management of companion animals, livestock, and poultry. These facets address the production of meat, milk, eggs, wool, and other animal services such as companionship, work, and recreation. In addition, the department addresses the care/well-being of animals as it impacts and enhances the human/animal bond along with the production levels of those animals. Essential to this information is the knowledge generated from the field of animal behavior/bioethics, genetics, nutrition, reproduction, and physiology.

The curriculum designates university and departmental requirements for the BS degree in Animal Sciences. In addition, there are five specialized program options students can choose to pursue. These include: Animal Behavior, Animal BioHealth/Pre-Professional, Animal Production, Equine, and Rangeland Sciences. Diverse teaching and research programs allow students to gain skills, knowledge, and practical experience. This will prepare students graduating from the program to pursue an assortment of employment opportunities. Potential employment areas may include farm and ranch management; product quality assessment of meat, poultry, eggs and milk; the Cooperative Extension Service; sales or technical service with commercial feed, seed, and chemical companies and pharmaceutical firms; agricultural loan officer; government agency positions at local, state, and federal levels; animal welfare auditing; animal behavior consulting; business management; as well as journalism, mass media, and public policy. In addition, students are prepared to go on to advanced studies in animal sciences, veterinary medicine, pharmacy schools, human medicine, nursing schools, dental schools, and education.

Graduate work leading to MS or PhD degrees in Animal Sciences may involve research projects that concentrate on areas such as animal nutrition, dairy production, embryo physiology, endocrinology, growth and development, livestock management, nutritional biochemistry, and reproduction physiology.

Cooperative Programs

Students transferring after one or two years at a community college should also be able to complete the requirements for a BS after three or two years, respectively.

Rangeland Sciences

Rangeland Sciences consist of the study and sustainable management of rangelands across a variety of biomes, from arid deserts to mesic grasslands, to tropical savannahs. The program takes an interdisciplinary approach to provide advanced scientific knowledge regarding multiple ecological processes and social drivers influencing rangeland ecosystems around the globe. Students in Rangeland Sciences gain the skills and knowledge needed to fully understand and effectively manage rangelands for improved productivity and enhanced ecosystem resilience. Students graduating from the program will be able to integrate contemporary rangeland ecology and management principles into systems-based decision-making frameworks to promote ecological resilience, sustainable societies, and thriving economies in rangeland ecosystems. The Rangeland Sciences degree program is available both on-campus and via Ecampus.

The curriculum includes university and departmental requirements for the BS degree in Rangeland Sciences. It also provides the opportunity for doing a minor in the subject of interest for the student (e.g., Animal Sciences).

There are a variety of scholarships and student employment opportunities available to students in the Rangeland Sciences program. There are opportunities all year along for students to gain practical experience in various research projects conducted by faculty in the program. Also, there are several options for summer employment with private industry, government agencies, and on range research projects.

The Rangeland Sciences program is accredited by the professional Society for Range Management (SRM). Accreditation ensures that graduates from the program have the necessary knowledge to join the rangeland science profession regardless of where in the world they may end up launching a job. Accreditation with SRM also helps to build a map to Federal OPM course requirements for multiple 400-series Biological Sciences positions (i.e., 401 Natural Resources Management and Biological Sciences; 408 Ecology Series; 454 Range Management Series; and 457 Soil Conservation Series). This is an important feature of the Rangeland Sciences program as many students go on to careers with federal or state agencies.

Graduate work leading to MAIS, MS, or PhD degrees in Rangeland Sciences may involve research on habitat management and restoration, watershed and riparian systems management, land use-environment relationships, ecohydrology, agroecology, ecophysiology, pastoral systems, and landscape ecology.

Undergraduate Programs

Program Name	SIS Code	Degree Types	Campus Locations
Animal Sciences Major (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-bs-hbs/)	125	BS, HBS	Corvallis, Ecampus
Animal Sciences Major: Animal Behavior Option (https://catalog.oregonsta college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-bs-hbs/animal-behavior-option/)	707	BS, HBS	Corvallis

Animal Sciences Major: Animal BioHealth/Pre-Professional Option (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-bs-hbs/animal-biohealthpre-professional-option/)	709	BS, HBS	Corvallis
Animal Sciences Major: Animal Production Option (https://catalog.oregonsta college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-bs-hbs/animal-production-option/)	708	BS, HBS	Corvallis
Animal Sciences Major: Equine Option (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-bs-hbs/equine-option/)	693	BS, HBS	Corvallis
Animal Sciences Major: Rangeland Science Option (https://catalog.oregonsta college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-bs-hbs/rangeland-science-option/)	712	BS, HBS	Corvallis
Animal Sciences Minor (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/animal-sciences-minor/)	125	Minor	Corvallis, Ecampus, LaGrande
Rangeland Sciences Major (https://catalog.oregonsta college-departments/agricultural-sciences/animal-rangeland-sciences/rangeland-sciences-bs-hbs/)	292	BS, HBS	Corvallis, Ecampus, LaGrande
Rangeland Science Minor (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/rangeland-science-minor/)	794	Minor	Corvallis, LaGrande

Graduate Programs

Program Name	SIS Code	Degree Types	Campus Locations
Animal Science Major (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/animal-science-ms-phd/)	1250	MS, PhD	Corvallis
Animal Science Minor (https://catalog.oregonsta college-departments/agricultural-sciences/animal-rangeland-sciences/animal-science-graduate-minor/)	1250	Minor	Corvallis

Rangeland Ecology and Management Major (https://catalog.oregonstate.edu/college-departments/agricultural-sciences/animal-rangeland-sciences/rangeland-ecology-management-ms-phd/)	6220	MS, PhD	Corvallis
Rangeland Ecology and Management Minor (https://catalog.oregonsta college-departments/agricultural-sciences/animal-rangeland-sciences/rangeland-ecology-management-graduate-minor/)	6220	Minor	Corvallis

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Faculty & Staff

https://anrs.oregonstate.edu/anrs/people/faculty-staff

Animal Science (ANS)

ANS LDEA, LOWER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

ANS UDEA, UPPER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

ANS 121, +*INTRODUCTION TO ANIMAL SCIENCES, 4 Credits

Examines the core sciences used in the study of domestic animals (livestock, poultry and companion animals) that include nutrition, reproduction, genetics, behavior, anatomy and physiology. Informs how these science fields with their theories, concepts and principles will impact the care and management of domestic animals and their uses for food/fiber production, companionship, and/or work. Explores domestic animals' role in society, economics, and daily life at a local, regional, and global level.
Attributes: CFSI — Core Ed - Scientific Inquiry & Analysis; CPBS — Bacc Core, Perspectives, Biological Science
Equivalent to: ANS 121H
Available via Ecampus

ANS 121H, +*INTRODUCTION TO ANIMAL SCIENCES, 4 Credits

Examines the core sciences used in the study of domestic animals (livestock, poultry and companion animals) that include nutrition, reproduction, genetics, behavior, anatomy and physiology. Informs how these science fields with their theories, concepts and principles will impact the care and management of domestic animals and their uses for food/fiber production, companionship, and/or work. Explores domestic animals' role in society, economics, and daily life at a local, regional, and global level.
Attributes: CFSI — Core Ed - Scientific Inquiry & Analysis; CPBS — Bacc Core, Perspectives, Biological Science; HNRS — Honors Course Designator
Equivalent to: ANS 121

ANS 201, DOMESTIC ANIMAL SYSTEMS I, 3 Credits

Describe management of dairy cattle, swine, and small ruminants including health, nutrition, reproduction, housing and economics. Explore history and development of domesticated animal species. Identify common breeds, their characteristics and uses. Compare structure of animal industries including species specific management practices. Evaluate current issues in domesticated animal use and management.
Prerequisite: ANS 121 with D- or better or ANS 121H with D- or better
Available via Ecampus

ANS 202, DOMESTIC ANIMAL SYSTEMS II, 3 Credits

Describe management of beef cattle, equine, and companion animals including health, nutrition, reproduction, housing and economics. Explore history and development of domesticated animal species. Identify common breeds, their characteristics and uses. Compare structure of animal industries including species specific management practices. Evaluate current issues in domesticated animal use and management.
Prerequisite: ANS 121 with D- or better or ANS 121H with D- or better

ANS 210, +ANIMAL SCIENCES CAREERS I, 1 Credit

Explores opportunities available to individuals with Animal Science degrees. Focuses on articulation of career readiness and how to translate experiences (Academic, Job-related, and extra-curricular) into in-demand career skills by employers of Animal Science graduates. Emphasizes career development opportunities available to Animal Science students, and multiple ways to align skills with desired attributes of Animal Science-related careers.
Attributes: CSC1 – Core Ed - Beyond OSU Career Preparation
Prerequisite: CORE 100 (may be taken concurrently) with D- or better or CORE 300 (may be taken concurrently) with D- or better or BA 100 (may be taken concurrently) with D- or better or BA 300 (may be taken concurrently) with D- or better or ED 100 (may be taken concurrently) with D- or better or ED 300 (may be taken concurrently) with D- or better or LA 100 (may be taken concurrently) with D- or better or LA 300 (may be taken concurrently) with D- or better or SCI 100 (may be taken concurrently) with D- or better or SCI 300 (may be taken concurrently) with D- or better or ENGR 110 (may be taken concurrently) with D- or better or ENGR 110H (may be taken concurrently) with D- or better or ENGR 310 (may be taken concurrently) with D- or better or Baccalaureate Core Student with a score of 1
Recommended: ANS 121
Available via Ecampus

ANS 220, INTRODUCTORY HORSE SCIENCE, 3 Credits

Introduction to horses, their history, breeds, form and function, performance evaluation, current industry status, and general management.
Recommended: ANS 121

ANS 231, LIVESTOCK EVALUATION, 3 Credits

Focuses on an individual animal's economic merit as compared to a sample group. Visual appraisal, performance data, and carcass merit are stressed. Includes the evaluation of both market and breeding animals. The livestock species of concentration include beef cattle, swine, sheep, and meat goats.
Recommended: ANS 121

ANS 251, PRINCIPLES OF ANIMAL FOODS TECHNOLOGY, 3 Credits

Explore the factors impacting meat quality and the processing of meat, milk, and eggs into food for human consumption. Investigate historical development of the U.S. meat industry. Explain biological and chemical principles that determine meat quality. Identify governing agencies that oversee and regulate inspection and food safety protocols. Assess economic influence of meat, dairy, and egg products.
Recommended: ANS 121
Available via Ecampus

ANS 280, COMPANION ANIMAL MANAGEMENT, 4 Credits

An introduction to the challenges, responsibilities, and benefits of interaction with selected companion animals. Topics covered will provide an overview of the human-animal bond, the position of companion animals in society, ethical issues of pet ownership and potential career opportunities. In addition, the course will serve as an introduction to preventive care and normal behavior of dogs, cats, and selected exotic pets. As the Department of Animal and Rangeland Sciences curriculum offers courses addressing equine care and husbandry, horses will not be discussed in this class.

ANS 299, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.

ANS 302, COMMON DISEASES OF COMPANION ANIMALS, 4 Credits

An introduction to common diseases of selected companion animals. Emphasis will be placed on identifying predisposing factors, clinical signs, common diagnostic procedures and potential implications for human health.
Prerequisite: (((BI 221Z with D- or better or BI 221HZ with D- or better) and (BI 222Z [D-] or BI 222HZ [D-]) and (BI 223Z [D-] or BI 223HZ [D-])) or ((BI 221 [D-] or BI 221H [D-]) and (BI 222 [D-] or BI 222H [D-]) and (BI 223 [D-] or BI 223H [D-])) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])) and (CH 121 [D-] or CH 121NL [D-]) and CH 122 [D-] and CH 123 [D-]
Recommended: ANS 280
Available via Ecampus

ANS 310, +ANIMAL SCIENCES CAREERS II, 2 Credits

Emphasizes career centered student experiences inside and outside the classroom. Develops career readiness skills through the creation of career artifacts and participation in experiential learning opportunities such as career fairs and workshops, mock interviews, and an informational interview. Examines and explores internship and career opportunities in the animal science discipline.
Attributes: CSC2 – Core Ed - Beyond OSU Career Engagement
Prerequisite: ANS 210 with D- or better

ANS 311, PRINCIPLES OF ANIMAL NUTRITION, 3 Credits

Classification, digestion, absorption, and metabolism of nutrients in animals; consequences of nutritional deficiencies and toxicities.
Prerequisite: ((BI 221Z with D- or better or BI 221HZ with D- or better) and (BI 222Z [D-] or BI 222HZ [D-]) and (BI 223Z [D-] or BI 223HZ [D-])) or ((BI 221 [D-] or BI 221H [D-]) and (BI 222 [D-] or BI 222H [D-]) and (BI 223 [D-] or BI 223H [D-])) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])
Available via Ecampus

ANS 313, APPLIED ANIMAL NUTRITION: FEEDS AND RATION FORMULATION, 4 Credits

Discusses topics relevant to feedstuff identification and nutrient analysis, feed processing and formulation of balanced animal diets based on nutrient requirements. Provides students hands-on experiences in identifying various feedstuffs and formulating rations based on the nutrient composition of those feedstuffs.
Recommended: MTH 111Z
Available via Ecampus

ANS 314, ANIMAL PHYSIOLOGY, 4 Credits

Biological basis of animal performance; describes how networks of cells act cooperatively to enable locomotion, provide a stable internal environment, allocate resources, remove metabolic end-products, and counteract microorganisms.
Recommended: General principles of biology equivalent to BI 221, BI 222, BI 223 and junior standing or higher
Available via Ecampus

ANS 315, +*CONTENTIOUS SOCIAL ISSUES IN ANIMAL SCIENCE, 3 Credits

Examines the contentious issues seen in animal science including the role of animal products in human health, food security and climate change; the ethics of the use of hormones, antibiotics, and new animal biotechnologies; animal rights/welfare in relation to animal science and in specific instances of common management practices. Evaluates the environmental implications of livestock grazing on public lands. Critiques potential solutions/changes, weighing them against all sectors affected by each issue.
Attributes: CSSS – Core Ed - Seeking Solutions; CSST – Bacc Core, Synthesis, Science/Technology/Society
Available via Ecampus

ANS 316, REPRODUCTION IN DOMESTIC ANIMALS, 4 Credits

Anatomy and physiology of mammalian and avian reproductive systems; fertilization, embryonic and fetal development, placentation and parturition; reproductive technologies.
Prerequisite: (((BI 221Z with D- or better or BI 221HZ with D- or better) and (BI 222Z [D-] or BI 222HZ [D-]) and (BI 223Z [D-] or BI 223HZ [D-])) or ((BI 221 [D-] or BI 221H [D-]) and (BI 222 [D-] or BI 222H [D-]) and (BI 223 [D-] or BI 223H [D-])) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])) and (CH 121 [D-] or CH 121NL [D-] or CH 221Z [D-] or CH 221HZ [D-] or CH 231 [D-] or CH 231H [D-])
Recommended: ANS 121
Available via Ecampus

ANS 317, REPRODUCTION IN DOMESTIC ANIMALS LABORATORY, 1 Credit

Gross and microscopic anatomy of the reproductive tract; semen collection, evaluation and extension; evaluation of fertilization, embryo and fetal development and placentation.
Prerequisite: ANS 316 (may be taken concurrently) with D- or better
Available via Ecampus

ANS 320, PRINCIPLES OF COMPANION ANIMAL NUTRITION, 3 Credits

Learn about nutrients, the digestive process, and the application of nutritional sciences to the health and welfare of companion animals. Introduction to the metabolic basis and practical preventative management for nutritional diseases in companion animals.
Prerequisite: ((BI 221Z with D- or better or BI 221HZ with D- or better) and (BI 222Z [D-] or BI 222HZ [D-]) and (BI 223Z [D-] or BI 223HZ [D-])) or ((BI 221 [D-] or BI 221H [D-]) and (BI 222 [D-] or BI 222H [D-]) and (BI 223 [D-] or BI 223H [D-])) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])

ANS 333, EQUINE STABLE MANAGEMENT, 3 Credits

Discusses developing a business plan, financial statements, and ratios, budgeting, financial planning, taxation, and employment issues within the current equine industry.
Prerequisite: ANS 220 with D- or better
Available via Ecampus

ANS 335, EQUINE HEALTH AND DISEASE, 3 Credits

Recognition of common diseases and disorders including their cause, treatment and prevention. Management of internal and external parasites. Recognizing common lameness issues.

ANS 341, ANIMAL BEHAVIOR AND COGNITION, 3 Credits

Survey, discuss, and explore principles of animal behavior and cognition from a comparative perspective, taking into account the interacting influences of biology, environment, and life experience on the individual and group behavior of animals across species. Aspects of animal cognition, including reasoning, perception, memory and personality, that play an important role in animal behavior will also be addressed.
Prerequisite: Z 102 with D or better or BI 102 with D or better or ((BI 221Z with D or better or BI 221HZ with D or better) and (BI 222Z [D] or BI 222HZ [D]) and (BI 223Z [D] or BI 223HZ [D])) or ((BI 221 [D] or BI 221H [D]) and (BI 222 [D] or BI 222H [D]) and (BI 223 [D] or BI 223H [D])) or (BI 204 [D] and BI 205 [D] and BI 206 [D])

ANS 351, ADVANCED PRINCIPLES OF ANIMAL FOODS TECHNOLOGY, 4 Credits

Provides in-depth coverage of both fresh and processed meats and eggs into products suitable for human consumption.
Recommended: ANS 251

ANS 378, ANIMAL GENETICS, 4 Credits

Emphasizes fundamentals of inheritance, principles of genetic segregation, population and quantitative genetics, response to natural selection, and artificial manipulation of populations.
Prerequisite: BI 221Z with D- or better or BI 221HZ with D- or better or BI 222Z with D- or better or BI 222HZ with D- or better or BI 223 with D- or better or BI 223HZ with D- or better or BI 221 with D- or better or BI 221H with D- or better or BI 222 with D- or better or BI 222H with D- or better or BI 223H with D- or better or BI 204 with D- or better or BI 205 with D- or better or BI 206 with D- or better
Recommended: ANS 121 and ST 351
Available via Ecampus

ANS 380, PRINCIPLES OF ANIMAL ANATOMY AND PHYSIOLOGY, 3 Credits

An introductory course in animal anatomy to provide a foundation for advanced courses in the Animal Science curriculum. Emphasis is on acquisition of a basic knowledge of minute and gross anatomical structures, their operation, and integration. Begins with anatomical nomenclature such as body planes and directional terms then covers the following tissues and organ systems: epithelium, connective tissue, blood and bone marrow, bone/cartilage, muscle tissue, nervous tissue, digestive system, circulatory system, reproductive system, urinary system, and respiratory system.
Prerequisite: ((BI 221Z with D or better or BI 221HZ with D or better) and (BI 222Z [D] or BI 222HZ [D]) and (BI 223Z [D] or BI 223HZ [D])) or ((BI 221 [D] or BI 221H [D]) and (BI 222 [D] or BI 222H [D]) and (BI 223 [D] or BI 223H [D])) or (BI 204 [D] and BI 205 [D] and BI 206 [D])
Available via Ecampus

ANS 385, FOUNDATIONS OF MAMMALIAN HISTOLOGY, 4 Credits

Provides a basic knowledge of mammalian microscopic anatomy. Emphasizes the appearance, organization and function of minute anatomical structures that can only be observed with the help of a visual enhancer, such as a microscope. Topics include basic histological techniques and histology and related functions of the following tissues and organ systems: epithelium, connective tissue, bone/cartilage, blood, muscle tissue, nervous tissue, circulatory system, digestive system, reproductive system, urinary system, respiratory system, immune system, integument, eye and ear. Covers gametogenesis, fertilization, and early development of the vertebrate embryo.
Prerequisite: (((BI 221Z with C- or better or BI 221HZ with C- or better) and (BI 222Z [C-] or BI 222HZ [C-]) and (BI 223Z [C-] or BI 223HZ [C-])) or ((BI 221 [C-] or BI 221H [C-]) and (BI 222 [C-] or BI 222H [C-]) and (BI 223 [C-] or BI 223H [C-])) or (BI 204 [C-] and BI 205 [C-] and BI 206 [C-])) and (BB 314 [C-] or BB 314H [C-]) and ANS 380 [C-]

ANS 390, GROSS ANATOMY OF DOMESTIC ANIMALS, 4 Credits

Provides a foundation for advanced courses in animal science. Emphasizes mammalian anatomy, including anatomical nomenclature, structure, operation, and integration of major organ systems. Uses the dog as a general model while some comparative domestic animal anatomy will also be covered.
Prerequisite: (((BI 221Z with D or better or BI 221HZ with D or better) and (BI 222Z [D] or BI 222HZ [D]) and (BI 223Z [D] or BI 223HZ [D])) or ((BI 221 [D] or BI 221H [D]) and (BI 222 [D] or BI 222H [D]) and (BI 223 [D] or BI 223H [D])) or (BI 204 [D] and BI 205 [D] and BI 206 [D])) and ANS 380 [D]

ANS 399, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.

ANS 401, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

ANS 403, THESIS, 1-16 Credits

This course is repeatable for 16 credits.

ANS 405, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

ANS 407, SEMINAR, 1-16 Credits

This course is repeatable for 16 credits.

ANS 410, ANIMAL SCIENCE INTERNSHIP, 1-12 Credits

This course is repeatable for 16 credits.
Available via Ecampus

ANS 420, ^ETHICAL ISSUES OF ANIMALS IN SOCIETY, 3 Credits

Provides an opportunity to discuss, debate and write extensively about current, relevant, and controversial social issues dealing with modern animal agriculture.
Attributes: CSWC — Core Ed - Writing Intensive Curriculum (WIC); CWIC — Bacc Core, Skills, Writing Intensive Curriculum (WIC)
Available via Ecampus

ANS 427, APPLIED PHYSIOLOGY OF REPRODUCTION, 5 Credits

Principles, techniques and recent development in semen collection, evaluation, extension and preservation; artificial insemination, estrus detection and synchronization; pregnancy diagnosis and embryo transfer.
Prerequisite: ANS 316 with C or better and ANS 317 [C]
Equivalent to: ANS 327

ANS 430, EQUINE SYSTEMS I: EXERCISE SCIENCE, 4 Credits

Intensively explore and apply science to real-life situations regarding cardiorespiratory, muscle physiology, and bone physiology responses to exercise, climate, and altitude.
Recommended: ANS 314

ANS 431, APPLIED EQUINE NUTRITION, 4 Credits

Applies science and learning appropriate techniques to feed horses in different physiological states to promote health and well-being. Covers metabolic disorders and the consequences of incorrect feeding.
Recommended: ANS 220, ANS 313

ANS 432, EQUINE SYSTEMS III: REPRODUCTION, 4 Credits

Senior and graduate students explore the fundamentals of equine reproduction and their application in horse breeding. Includes practical training of laboratory techniques.
Prerequisite: ANS 220 with D- or better and ANS 316 [D-]
Recommended: ANS 327

ANS 435, APPLIED ANIMAL BEHAVIOR, 3 Credits

Exploration of the fundamental processes of animal behavior and implications for animal management, production, housing and welfare. Covers a range of species, with emphasis on domestic animals.
Recommended: ANS 314 and Z 350

ANS 436, SHEEP PRODUCTION SYSTEMS, 3 Credits

Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool.
Recommended: ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 439, DAIRY PRODUCTION SYSTEMS, 4 Credits

Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle.
Recommended: ANS 215 and ANS 313 and ANS 316 and ANS 378

ANS 440, APPLIED DAIRY MANAGEMENT, 3 Credits

Focuses on knowledge and techniques for diagnosis of common diseases, preventative management, and therapeutic care necessary for a dairy herdsman position. Emphasizes hands-on instruction in basic calf, heifer, lactating and dry cow care. Discusses and practices essential management techniques including those relating to cattle handling, reproduction, hoof health, calf care as well as instruction in understanding and utilizing cow monitoring systems and records.
Prerequisite: ANS 439 with D- or better

ANS 441, TOPICS IN ANIMAL LEARNING, 3 Credits

Explore when and how the behavior of animals can be shaped by the environment, individual experiences, and interactions with other animals (including humans).
Prerequisite: ((BI 221Z with D- or better or BI 221HZ with D- or better) and (BI 222Z [D-] or BI 222HZ [D-]) and (BI 223Z [D-] or BI 223HZ [D-])) or ((BI 221 [D-] or BI 221H [D-]) and (BI 222 [D-] or BI 222H [D-]) and (BI 223 [D-] or BI 223H [D-])) or (BI 204 [D-] and BI 205 [D-] and BI 206 [D-])
Recommended: (ANS 435 or ANS 535) and Z 350

ANS 445, BEEF PRODUCTION SYSTEMS, 4 Credits

Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of beef cattle from conception through calving, weaning, stocker/back grounding and the feedlot. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 313 and ANS 316 and ANS 317 and ANS 378

ANS 448, LIVESTOCK PRODUCTION ON PASTURE, 4 Credits

Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED as ANS 448/CROP 448.
Equivalent to: CROP 448, RNG 448

ANS 450, CALVING SCHOOL, 3 Credits

Emphasizes knowledge of calving and calf care. Focuses on calving processes and identifies factors that affect calving and the health of maternal and neonatal beef cows. Provides hands-on, practical experience with calving.

ANS 452, LIVESTOCK HOUSING AND WASTE MANAGEMENT, 3 Credits

Basics in where, how, and why one would build, insulate, and ventilate livestock buildings. Manure and wastewater collection, treatment, storage, and utilization.

ANS 456, COMPANION ANIMAL PRODUCTION SYSTEMS, 3 Credits

Fundamentals of dog and cat breeding stock selection, feeding and housing as well as biology and management from estrus through parturition to weaning. Due to the nature of this class, a variety of animals may be present during class session. Questions and interactions are encouraged but, while precautions are taken, any contact with animals carries some risk of injury or illness.
Prerequisite: ANS 313 with D- or better and ANS 316 (may be taken concurrently) [D-] and ANS 317 (may be taken concurrently) [D-] and ANS 378 [D-]
Available via Ecampus

ANS 460, SWINE PRODUCTION SYSTEMS, 4 Credits

Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of swine from conception through farrowing, weaning, and the growing/finishing phases. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 121 and ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 499, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

ANS 501, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.

ANS 503, THESIS, 1-16 Credits

This course is repeatable for 999 credits.

ANS 505, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

ANS 507, GRADUATE SEMINAR, 1 Credit

This course is repeatable for 99 credits.

ANS 508, WORKSHOP, 1-16 Credits

This course is repeatable for 16 credits.

ANS 509, TEACHING PRACTICUM, 1-16 Credits

This course is repeatable for 16 credits.

ANS 511, DIGESTIVE PHYSIOLOGY AND NUTRITION OF RUMINANT ANIMALS, 4 Credits

Anatomy and physiology of the ruminant digestive tract including rumen microbiology and digestive processes. Nutritional biochemistry and physiology of ruminants. Feed chemistry, feed intake and principles of ration balancing. Theory of energy and protein metabolism.
Recommended: ANS 311 or ANS 313

ANS 531, APPLIED EQUINE NUTRITION, 4 Credits

Applies science and learning appropriate techniques to feed horses in different physiological states to promote health and well-being. Covers metabolic disorders and the consequences of incorrect feeding.

ANS 532, EQUINE SYSTEMS III: REPRODUCTION, 4 Credits

Designed for seniors and graduate students to explore the fundamentals of equine reproduction and their application in horse breeding. Includes practical training in laboratory techniques.
Recommended: ANS 220 and ANS 316 and ANS 327

ANS 535, APPLIED ANIMAL BEHAVIOR, 3 Credits

Exploration of the fundamental processes of animal behavior and implications for animal management, production, housing and welfare. Covers a range of species, with emphasis on domestic animals.
Recommended: ANS 314 and Z 350

ANS 536, SHEEP PRODUCTION SYSTEMS, 3 Credits

Integration of nutrition, genetics, reproduction, behavior, and health principles into management systems for production and marketing of lamb and wool.
Recommended: ANS 216 and ANS 311 and ANS 316 and ANS 378

ANS 539, DAIRY PRODUCTION SYSTEMS, 4 Credits

Fundamentals of nutrition, breeding, reproductive physiology and health programs and their applications in the care and management of dairy cattle.
Recommended: ANS 215 and ANS 313 and ANS 316 and ANS 378

ANS 541, TOPICS IN ANIMAL LEARNING, 3 Credits

Explore when and how the behavior of animals can be shaped by the environment, individual experiences, and interactions with other animals (including humans).
Recommended: (BI 221 and BI 222 and BI 223) and (ANS 435 or ANS 535) and Z 350

ANS 545, BEEF PRODUCTION SYSTEMS, 4 Credits

Students will be exposed to the fundamentals of nutrition, reproductive physiology, selection, health programs, and their applications in the care and management of beef cattle from conception through calving, weaning, stocker/back grounding and the feedlot. Students will practice decision-making processes using working case studies. Overnight field trip with extra fee charged.
Recommended: ANS 313 and ANS 316 and ANS 317 and ANS 378

ANS 548, LIVESTOCK PRODUCTION ON PASTURE, 4 Credits

Focuses on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems.
Equivalent to: CROP 548, RNG 548

ANS 550, ORGANIC ANIMAL PRODUCTION SYSTEMS, 3 Credits

Topics include the principles of livestock production, legislation, animal welfare, and marketing of organic production systems. Course emphasizes principles, concepts, and techniques of organic and sustainable production of animals.
Available via Ecampus

ANS 560, LIPID METABOLISM, 3 Credits

Digestion, absorption and metabolism of lipids with emphasis on lipoprotein metabolism, regulation of lipid metabolism in various tissues and metabolism of eicosanoids.
Recommended: BB 492

ANS 565, AGROECOLOGY IN LIVESTOCK PRODUCTION, 3 Credits

Explores agroecological principles and sustainability in pasture-based livestock systems. Examines the role of carbon sequestration, nutrient cycling, and soil health in rangeland ecosystems. Highlights sustainable management strategies, including crop rotations, cover cropping, and adaptive grazing. Emphasizes sustainable intensification within integrated crop-livestock systems, with a focus on enhancing productivity and resilience in Oregon's diverse agricultural landscapes.

ANS 599, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.

ANS 601, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.

ANS 603, THESIS, 1-16 Credits

This course is repeatable for 999 credits.

ANS 605, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

ANS 606, PROJECTS, 1-16 Credits

This course is repeatable for 16 credits.

ANS 607, GRADUATE SEMINAR, 1 Credit

This course is repeatable for 99 credits.

ANS 608, WORKSHOP, 1-16 Credits

This course is repeatable for 16 credits.

ANS 609, TEACHING PRACTICUM, 1-16 Credits

This course is repeatable for 16 credits.

ANS 662, HORMONE ACTION, 3 Credits

Mechanisms of action of peptide and steroid hormones and related compounds at the cellular level.

Prerequisite: BB 551 with C or better or BB 592 with C or better

ANS 673, BIOLOGY OF MAMMALIAN REPRODUCTION, 4 Credits

Physiological, neuroendocrine, endocrine and environmental factors that regulate reproduction of mammals.

Recommended: ANS 316 and BB 350

ANS 699, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.

Rangeland Ecology & Management (RNG)

RNG LDEA, LOWER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

RNG UDEA, UPPER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

RNG 121, *INTRODUCTION TO WILDLAND ECOLOGY, 4 Credits

Ecological principles will be applied to understand contemporary issues related to wildlands, specifically the rangeland biomes that comprises over 50% of the Earth's surface (FAO, SRM, USDA ERS). Topics to be covered fall into the following categories: Fundamentals of Ecology; Animals (wildlife & livestock); Disturbance (e.g., invasive species, fire, mineral extraction, etc.); Ecosystem Goods & Services (e.g., carbon sequestration, watersheds, biodiversity, recreation, etc.). The course will largely focus on U.S. wildlands, however a portion will examine the ecology and issues of international rangelands in Africa, Eurasia, Australia, and South America.

Attributes: CPBS – Bacc Core, Perspectives, Biological Science

Available via Ecampus

RNG 299, SPECIAL TOPICS, 1-16 Credits

Equivalent to: RNG 299H

This course is repeatable for 16 credits.

RNG 299H, SPECIAL TOPICS, 1-16 Credits

Attributes: HNRS – Honors Course Designator

Equivalent to: RNG 299

This course is repeatable for 16 credits.

RNG 307, +LAND STEWARDSHIP CAREER SKILLS & BUILDING, 3 Credits

Explores career opportunities and job search knowledge and skills within the realm of western land stewardship opportunities. Develops thought processes on how to approach planning and developing a career trajectory, including academic planning to meet the Federal Office of Personnel Management (OPM) job requirements. Develops skills and artifacts (resume, cover letter, portfolio, and job profile) to apply and interview for a job.

Attributes: CSC1 – Core Ed - Beyond OSU Career Preparation; CSC2 – Core Ed - Beyond OSU Career Engagement

Prerequisite: CORE 100 with D- or better or CORE 300 with D- or better or BA 100 with D- or better or BA 300 with D- or better or ED 100 with D- or better or ED 300 with D- or better or ENGR 110 with D- or better or ENGR 110H with D- or better or ENGR 310 with D- or better or LA 100 with D- or better or LA 300 with D- or better or SCI 100 with D- or better or SCI 300 with D- or better or Baccalaureate Core Student with a score of 1

RNG 341, PRINCIPLES OF RANGELAND ECOLOGY AND MANAGEMENT, 3 Credits

Describes the ecology and management of North American rangelands with an emphasis on a holistic understanding of rangelands as social-ecological systems. Examines ecosystem goods and services, ecosystem function, disturbance ecology, and management frameworks and principles. Analyzes contemporary issues that threaten the health of rangelands including those that cause conflicts among stakeholders.

Recommended: (BI 221Z, BI 222Z & BI 223Z) or (BI 204, BI 205 & BI 206); coursework in soil science and ecology; analytical, critical thinking, and synthesis skills

Available via Ecampus

RNG 346, INTRODUCTION TO GRAZING ECOLOGY AND MANAGEMENT, 4 Credits

Applies the fundamentals of rangeland grazing management and grazing livestock production to craft grazing management plans. Focuses on the terms, concepts, methods and calculations related to grazing management.

Equivalent to: ANS 446

Recommended: RNG 341 or equivalent ecology course

Available via Ecampus

RNG 350, GRASSLAND AND SHRUBLAND ECOSYSTEM ECOLOGY, 4 Credits

Describe and classify rangeland ecosystems, including grasslands and shrublands, of North America. Compare structure and function of grassland and shrubland plant communities. Recognize common rangeland plant species and differentiate their life histories. Predict plant response to disturbance and stress.

Prerequisite: RNG 341 with D- or better

RNG 351, ECOLOGY OF GRASSLAND ECOSYSTEMS, 3 Credits

Describe and differentiate the spatio-temporal dynamics of North American grassland ecosystems including structure, function, and processes. Explore water, nutrient cycles and energy pathways as affected by driving forces of climate, herbivory, and fire.
Recommended: RNG 341
Available via Ecampus

RNG 352, ECOLOGY OF SHRUBLAND ECOSYSTEMS, 3 Credits

Describe and differentiate stress and disturbance impacts on shrubland ecosystems using an autecological approach. Explores the effects of climate, fire, and herbivory on plant morphology, physiology, reproduction, and growth. Evaluate and compare life histories of common shrubs and shrubland communities.
Recommended: RNG 341
Available via Ecampus

RNG 353, WILDLAND PLANT IDENTIFICATION, 4 Credits

Identify common plant species of grassland, shrubland and woodland ecosystems of North America and describe their ecological, cultural and economic importance. Use ecological, morphological and anatomical characteristics to identify plant species. Design and conduct plant inventories, collect and press voucher specimens and utilize dichotomous keys, hand lenses and microscopes to identify plant species.
Recommended: Coursework in botany or rangeland sciences
Available via Ecampus

RNG 399, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.

RNG 403, SENIOR THESIS, 1-16 Credits

This course is repeatable for 16 credits.

RNG 405, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

RNG 406, PROJECTS, 1-16 Credits

This course is repeatable for 16 credits.

RNG 407, SEMINAR, 1 Credit

This course is repeatable for 6 credits.

RNG 421, RANGELAND RESTORATION AND MANAGEMENT, 4 Credits

Describe and evaluate principles, tools and techniques guiding the restoration of degraded rangelands including grassland, shrubland, woodland, riparian and dry forest ecosystems. Identify and understand ecological factors, processes, stressors and pressures that interact to determine ecological health, resistance and resilience. Manipulate plants, soil, animals and microenvironments to improve ecosystem function and services. Conduct site assessments to identify key causes of degradation, and create restoration and management solutions that incorporates ecological, economic, and social factors.
Prerequisite: ((BI 221 with D or better or BI 221H with D or better) and (BI 222 [D] or BI 222H [D]) and (BI 223 [D] or BI 223H [D])) or ((BI 221Z [D] or BI 221HZ [D]) and (BI 222Z [D] or BI 222HZ [D]) and (BI 223Z [D] or BI 223HZ [D])) or (BI 204 [D] and BI 205 [D] and BI 206 [D])
Recommended: Coursework in soils and ecology
Available via Ecampus

RNG 441, VEGETATION MONITORING AND ANALYSIS, 4 Credits

Describe techniques and methods used to measure, monitor and analyze vegetation attributes and natural resource data in shrubland, grassland, and forest ecosystems. Topics include sampling principles and design; protocol development; inventory and monitoring; field methods; analysis, evaluation and interpretation of resource data. Field-oriented course, emphasizing both theory and practice.
Prerequisite: ((BI 221 with D or better or BI 221H with D or better) and (BI 222 [D] or BI 222H [D]) and (BI 223 [D] or BI 223H [D])) or ((BI 221Z [D] or BI 221HZ [D]) and (BI 222Z [D] or BI 222HZ [D]) and (BI 223Z [D] or BI 223HZ [D])) or (BI 204 [D] and BI 205 [D] and BI 206 [D])
Recommended: Coursework in ecology
Available via Ecampus

RNG 442, RANGELAND-ANIMAL RELATIONS, 4 Credits

Examines ecological principles of domesticated livestock grazing and their applications to the management of rangelands. Emphasizes sustainability of ecosystem goods and services including grazing effects on individual plants, plant communities and ecosystems. Analyzes grazing management principles to integrate livestock production and enhance ecological goods and services.
Prerequisite: (((BI 221 with D or better or BI 221H with D or better) and (BI 222 [D] or BI 222H [D]) and (BI 223 [D] or BI 223H [D])) or ((BI 221Z [D] or BI 221HZ [D]) and (BI 222Z [D] or BI 222HZ [D]) and (BI 223Z [D] or BI 223HZ [D])) or (BI 204 [D] and BI 205 [D] and BI 206 [D])) and RNG 341 [D]
Recommended: Coursework in soils and ecology
Available via Ecampus

RNG 455, RIPARIAN ECOHYDROLOGY AND MANAGEMENT, 4 Credits

A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).
Available via Ecampus

RNG 457, HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT, 3 Credits

Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.
Prerequisite: FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D-] or ST 243Z [D-] or ST 351 [D-] or ST 351H [D-])
Available via Ecampus

RNG 470, *PASTORAL SYSTEMS OF THE WORLD, 4 Credits

Describes and evaluates ecosystems which support grazing animals and pastoralists. Examines the biology, ecology and management of these landscapes including climate, soils, plant communities and human-livestock interactions. Investigates the historic role of trade and contemporary challenges to the ecological, social and economic sustainability of pastoral systems.
Attributes: CSGI — Bacc Core, Synthesis, Contemporary Global Issues
Recommended: RNG 341 or other applied terrestrial ecology course
Available via Ecampus

RNG 491, ^RANGELAND MANAGEMENT PLANNING - PRINCIPLES AND PROCESSES, 4 Credits

Applies rangeland ecology principles and processes to select and solve a site-specific rangeland management challenge. Develops professional communication skills including listening, dialog, writing, and negotiating with diverse stakeholders to create a multi-stage management plan through implementation of adaptive management. Demonstrates knowledge of monitoring to evaluate effectiveness and report outcomes of management actions.
Attributes: CSWC — Core Ed - Writing Intensive Curriculum (WIC); CWIC — Bacc Core, Skills, Writing Intensive Curriculum (WIC)
Prerequisite: RNG 341 with D- or better
Available via Ecampus

RNG 499, SPECIAL TOPICS, 0-16 Credits

This course is repeatable for 16 credits.
Available via Ecampus

RNG 501, RESEARCH AND SCHOLARSHIP, 1-16 Credits

This course is repeatable for 16 credits.

RNG 503, MASTER'S THESIS, 1-16 Credits

This course is repeatable for 999 credits.

RNG 505, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

RNG 506, PROJECTS, 1-16 Credits

This course is repeatable for 16 credits.

RNG 507, SEMINAR, 1-2 Credits

This course is repeatable for 16 credits.

RNG 521, RANGELAND RESTORATION AND MANAGEMENT, 4 Credits

Describe and evaluate principles, tools and techniques guiding the restoration of degraded rangelands including grassland, shrubland, woodland, riparian and dry forest ecosystems. Identify and understand ecological factors, processes, stressors and pressures that interact to determine ecological health, resistance and resilience. Manipulate plants, soil, animals and microenvironments to improve ecosystem function and services. Conduct site assessments to identify key causes of degradation, and create restoration and management solutions that incorporates ecological, economic, and social factors.
Recommended: Coursework in soils and ecology
Available via Ecampus

RNG 541, VEGETATION MONITORING AND ANALYSIS, 4 Credits

Describe techniques and methods used to measure, monitor and analyze vegetation attributes and natural resource data in shrubland, grassland, and forest ecosystems. Topics include sampling principles and design; protocol development; inventory and monitoring; field methods; analysis, evaluation and interpretation of resource data. Field-oriented course, emphasizing both theory and practice.
Recommended: Coursework in ecology
Available via Ecampus

RNG 542, RANGELAND-ANIMAL RELATIONS, 4 Credits

Examines ecological principles of domesticated livestock grazing and their applications to the management of rangelands. Emphasizes sustainability of ecosystem goods and services including grazing effects on individual plants, plant communities and ecosystems. Analyzes grazing management principles to integrate livestock production and enhance ecological goods and services.
Recommended: Coursework in soils and ecology
Available via Ecampus

RNG 555, RIPARIAN ECOHYDROLOGY AND MANAGEMENT, 4 Credits

A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).
Available via Ecampus

RNG 557, HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT, 3 Credits

Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.
Recommended: ST 511 and ST 512
Available via Ecampus

RNG 599, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.

RNG 601, RESEARCH AND SCHOLARSHIP, 1-16 Credits

This course is repeatable for 16 credits.

RNG 603, PH.D. THESIS, 1-16 Credits

This course is repeatable for 999 credits.

RNG 605, READING AND CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

RNG 606, PROJECTS, 1-16 Credits

This course is repeatable for 16 credits.

RNG 607, SEMINAR, 1-2 Credits

This course is repeatable for 16 credits.

RNG 608, WORKSHOP, 1-16 Credits

This course is repeatable for 16 credits.

RNG 662, RANGELAND ECOLOGY, 3 Credits

Studies ecological theory and related resource management implications in rangelands and arid wildlands. Topics include the history and development of rangeland ecology, plant demography, invasive species, plant population dynamics, disturbance theory, succession, vegetation classification and range condition assessments.
Recommended: Basic ecology course

RNG 699, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.