

AGRICULTURE AND NATURAL RESOURCES

The Agriculture and Natural Resource (AGNR) Department prepares students with the knowledge and workforce skills to enter rapidly evolving career fields in Agriculture and Natural Resource Management. The rapid evolution in the scope and type of these career opportunities are driven by the reality that California and the United States are rapidly reaching a crisis situation in the management and conservation of natural resources. The recent crises with water and energy in California bear witness to this fact. The most important issues concern the critical natural resources of food, energy, water, air, minerals, wild-land, and wildlife. It is essential that our society be taught a greater awareness of the need to conserve and sustainably manage these resources. Careers and the public and private entities that produce, manage, and use these resources are expanding rapidly as the critical nature of these issues become more apparent. Individuals that are trained in agricultural and natural resource management principles and technologies are perfectly positioned to take advantage of these exciting opportunities.

The AGNR department provides students with a Guided Career Technical Pathways in: Agricultural Sciences and Natural Resources (ASNR). This pathway is designed to provide a seamless progression of study that can start in High School, through Community College, via one of two Associate of Science Transfer degrees- Plant Sciences or Animal Sciences and culminating in a University Degree. Students may also transition more directly into a career by taking career relevant classes and completing one or more of six(6) career focused Certificates of Achievement (in: Animal Science; Equine Science; Ecological Restoration; Environmental Horticulture and Landscaping; Natural Resource and Environmental Technology and Plant Science and Sustainable Agriculture) and/or a Environmental Horticulture Associates degree.

Career Opportunities

Agribusiness Managers, Economists, Statisticians and Analysts; Agriculture and Conservation Extension Officers; Agricultural and Food Inspectors; Agriculture and Natural Resource Educators; Artificial Insemination and Embryo Transfer Technician; Air Quality Monitoring Technicians; Arborists and Tree Pruning Technicians; Animal Scientists, Animal Breeders Trainers and Managers; Animal Product and Pharmaceutical Representatives; Education and Conservation Technicians Environmental Scientists; Environmental and Natural Resource Planners; Ecological Restoration Specialists; Farm/Ranch Hands and Managers; Field Biologists; Floral Design Technicians and Managers; Food Science, Processing and Safety Technician; Geographic Information Technicians and Analysts; Golf Course and Turf Grass Managers; Horticulture; Livestock Breed, Publication and Sales Representatives; Meat and Dairy Quality Control and Inspection Technicians Pesticide and Fertilizer Industry Sales Representatives; Irrigation Consultants and Technicians; Laboratory Technician, Landscape Architects and Designers; Landscape Contractors and Technicians; Natural Resource Management Technicians, Nursery Technicians and Managers; Nutritionist; Organic Practices Advisors; Park and Wildlife Managers; Pest Control Advisors, Plant Breeders, Propagators and Growers; Research Scientist; Solid Waste and Recycling Technicians; Waste Water Technicians; Water Conservation and Distribution Technicians; Environmental Sciences Lab Technicians; Wildlife, Fish and Conservation Biologists; Veterinary Assistants; Zoo, City, Country Club and Botanic Garden Horticulturists.

Faculty

Rice, Jack

Slade, Neville

Transfer

- University of California, Riverside College of Natural and Agricultural Sciences
- University of California, Davis College of Agriculture and Environmental Science
- California State University
CSU campuses that offer majors or concentrations in Agricultural Science, Agriculture Business and Management, Environmental Horticulture, Plant Science, Natural Resource Management, Environmental Science, Animal and Veterinary Science, to include: Bakersfield, Chico, Fresno, Humboldt, Cal Poly Pomona and San Luis Obispo, San Bernardino, Stanislaus.

For the most up-to-date information on these programs and others, visit [assist.org](https://www.assist.org/) (<https://www.assist.org/>). Please stop by the Transfer Center in Building 23 or make an appointment with a counselor if you have questions.

Programs of Study

- Agricultural Animal Sciences, AS-T (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/agricultural-animal-sciences-ast/>)
- Agricultural Plant Sciences, AS-T (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/agricultural-plant-sciences-ast/>)
- Animal Science Specialist Certificate of Achievement (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/animal-science-specialist-ca/>)
- Ecological Restoration Certificate of Achievement (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/ecological-restoration-ca/>)
- Environmental Horticulture and Landscaping Certificate of Achievement (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/environmental-horticulture-landscaping-ca/>)
- Environmental Horticulture, AS (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/environmental-horticulture-as/>)
- Equine Science Specialist Certificate of Achievement (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/equine-science-specialist-ca/>)
- Natural Resource and Environmental Technology Certificate of Achievement (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/natural-resource-environmental-technology-ca/>)
- Plant Science and Sustainable Agriculture Certificate of Achievement (<https://catalog.vvc.edu/degrees-certificates/agriculture-natural-resources/plant-science-sustainable-agriculture-ca/>)

Program Learning Outcomes

Program Learning Outcomes (PLOs) are statements of the kind of learning a program hopes a student will achieve. The PLOs describe the

knowledge, skills, problem-solving, communication and values that apply to all certificates and/or degrees within that program.

Upon completion of this program, students should be able to:

- a. Evaluate and communicate analytically including synthesis, and research on the relationship between natural social and economic systems; principles and values that enhance leadership, personal/social responsibility, community involvement and respect for others and the practices that support sustainability.
- b. Apply complex problem-solving skills and critical thinking using technology, the scientific method, natural resource policy, sustainable practices to current/real-world Agriculture and Natural Resource Management issues.
- c. To be prepared for an entry level career in the Agriculture and Natural Resource Management Industries and/or to transfer to an institute of higher education to further their preparation in one of the applied natural sciences or related disciplines.
- d. Ability to solve complex problems and address current/real-world agriculture and natural resource management issues, by applying technological solutions, the scientific method and sustainable practice.
- e. Ability to apply complex problem-solving skills using technology, scientific knowledge/ method, natural resource policy, sustainable practices, computer proficiency and industry standard equipment to current/real-world agriculture and natural resource management issues.
- f. Implement animal science and best practice in the animal industry.
- g. Demonstrate safe restraint and handling of animals, along with appropriate use of animal production and health tools/technologies.
- h. Implement ecological restoration best practices to restore ecological, physical and biological processes to ecosystems.
- i. Apply the scientific concepts and technological skills that support sustainable horticulture and landscape systems.
- j. Implement best management practices in Environmental Horticulture and Natural Landscaping.
- k. Implement equine husbandry and health care in the horse industry.
- l. Demonstrate safe restraint and handling of horses, along with appropriate use of equine health care tools and technologies.
- m. Apply the scientific concepts and technological skills that support natural resource management.
- n. Apply the scientific concepts and technological skills that support sustainable plant health and natural resource management.
- o. Implement agriculture and natural resource best practices, to solve agriculture and natural resource management issues.

Agriculture and Natural Resources Courses

AGNR 050 Innovations in Sustainable Agriculture and Horticulture (0.0 Units)

Students will learn the techniques and practices of Micro/Drip Irrigation, Hydroponics, Aquaponics, Intensive Vegetable Production, Permaculture and Ecological Restoration. Emphasis on hands on demonstrations and field studies where applicable.

Lab Hours: 54.0

Transfer: Not transferable

AGNR 60 Environmental Horticulture Laboratory (1.0 Units)

Horticulture laboratory setting for horticulture students to practice the skills gained from experience and traditional lecture/laboratory classes. This setting will further prepare students for employment in the horticulture industry.

Lab Hours: 54.0

Transfer: Not transferable

AGNR 60A Environmental Horticulture Laboratory (1.0 Units)

Lab Hours: 54.0

Transfer: Not transferable

AGNR 60B Environmental Horticulture Laboratory (1.0 Units)

Horticulture laboratory setting for students to further develop skills in the best practices and technology used for the production and maintenance of California Native plants for Ecological Restoration. Students learn propagation, seed collection and processing, pruning, organic fertilizing, pest management, drip irrigation and monitoring.

Lab Hours: 54.0

Transfer: Not transferable

AGNR 60C Environmental Horticulture Laboratory (1.0 Units)

Horticulture laboratory setting for students to further develop skills in the best practices, and technology used for the design, installation and management of low pressure and drip irrigation systems.

Lab Hours: 54.0

Transfer: Not transferable

AGNR 61C Recycling & Essentials of Composting (0.5 Units)

Students learn how to make productive use of unwanted yard waste and other biomass. Topics include: benefits of composting; the biological process of composting; materials that can and cannot be composted; composting methods; vermiculture; using the finished product as a soil conditioner or mulch; and using other solid waste such as straw and concrete in the landscape.

Lecture Hours: 9.0

Transfer: Not transferable

AGNR 74 Conservation & Sustainability Practices (5.0 Units)

This class introduces students to the exciting and rapidly expanding practices in the conservation and sustainable use of our natural resources. Local case studies and emerging green technology is presented. Students explore the social, economic, and environmental issues that underlie this new frontier in societal development. The Mojave Desert provides a wonderful natural laboratory where many of these sustainability issues can be explored.

Lecture Hours: 90.0; Lecture Hours: 5.63

Transfer: Not transferable

AGNR 74A Sustainable Community Leadership (1.0 Units)

Students learn to plan, manage and implement sustainable development practices; development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Focus is on the principles of Sustainable Development that ensure effective leadership and a balance of environmental, social, and economic issues. Extensive use is made of case studies and practical on-site experiences in the Mojave Desert.

Lecture Hours: 18.0

Transfer: Not transferable

AGNR 74B Biodiversity Management and Technology (1.0 Units)

The reduction of species diversity is a major indicator of the health of complete ecosystem. This class explores the science, tools and practice of conserving and managing biodiversity. Students learn to implement the exciting tools of Geographic Information Systems (GIS), Global Positioning Systems (GPS), Satellite Imaging and Database Management, along with an understanding of the expanding career opportunities in these fields. Extensive use is made of local Mojave Desert case studies.

Lecture Hours: 18.0

Transfer: Not transferable

AGNR 74C Waste and Pollution Management (1.0 Units)

Students study the use of our natural resources on the environmental, social and economic health of our planet. Focus on best practice and technologies for solid waste, green waste and waste water treatment. Careers in this rapidly expanding and dynamic field are highlighted. The consequences of poor management on the quality of our water and air are explored using real-world examples in the Mojave Watershed.

Lecture Hours: 18.0

Transfer: Not transferable

AGNR 74D Ecological Restoration (1.0 Units)

Students study ecological restoration that effectively repairs the damage done by human activities to natural habitats and ecosystems. The restoration methodologies study include: native materials acquisition, seed banking, Mycorrhizal relationships, seed treatments, greenhouse propagation, plant nutrient requirements, water requirements, transplanting protocols, soil evaluation and rehabilitation. Case studies will include riparian and surface mine reclamation in the Mojave Desert.

Lecture Hours: 18.0

Transfer: Not transferable

AGNR 74E Sustainable Agriculture Practices (1.0 Units)

This class explores the emerging practices of sustainable agriculture, in response to the negative consequences of industrialized agriculture. Tremendous progress has been made towards farming with nature and restoring ranches to be part of the natural ecosystem. This farming with the wild is not only producing more food but enhancing the environment. Students study sustainable practices such as: use of Heirloom seeds, natural fertilizers, drip irrigation, Integrated Pest Management, rotational grazing, organic farming, native hedgerows and natural pollination.

Lecture Hours: 18.0

Transfer: Not transferable

AGNR 100 General Animal Science (3.0 Units)

A scientific based overview of livestock and poultry production industry. Highlights anatomy, physiology, reproduction, nutrition, behavior, and health. Focuses on marketing pertinent to environmental and social issues, such as animal welfare. Includes human opportunity to influence trait inheritance, population densities, productivity and sustainability of the animal production industry. C-ID: AG-AS 104.

Lecture Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 101L Livestock Feeding and Nutrition (3.0 Units)

The science of animal nutrition including the fundamentals of digestion and absorption in both ruminants and non-ruminants. Anatomy of large animal digestive systems will be discussed along with feed requirements. Students will formulate rations for a variety of livestock for maximum performance and growth. Laboratory required.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 102 Equine Science (4.0 Units)

Survey of the equine industry, encompassing the importance and role of the horse throughout history. Focus is on breed selection and development, nutrition, disease, preventative health, reproductive management, basic horsemanship, stabling alternatives and career opportunities. Laboratory required.

Lecture Hours: 54.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 105 Equine Health (3.0 Units)

Students learn basic equine veterinary care, principles and practices. Course introduces the diseases and lameness associated with the musculoskeletal system, as well as diseases of the respiratory, digestive, neurological, and reproductive systems. Emphasis is on preventive maintenance and managerial practices needed to keep the equine athlete, broodmare, or family horse in good health.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

AGNR 106 Veterinary Terminology and Technology (3.0 Units)

Introduction to veterinary terminology and technology for small and large animal diagnostic evaluation. (Formerly AGNR 51)

Lecture Hours: 54.0

Transfer: Transfers to CSU only

AGNR 107 Livestock Selection and Evaluation (3.0 Units)

Detailed analysis of various visual and physical methods of appraising beef, sheep, swine and horses concerning functional and economic value. Written and oral summaries of evaluation will be learned. Specific reference will be made to performance data, preparing animals for market and show.

Lecture Hours: 54.0; Lecture Hours: 3.38

Transfer: Transfers to CSU only

AGNR 108 Animal Health & Sanitation (3.0 Units)

Study of common livestock diseases and fundamentals of immunity to include the livestock technician's role in promoting animal health and the foundation of disease control programs. Students are introduced to state-of-the art animal health care technology to include Endoscopy, Tomography (CT Scan), Magnetic Resonance Imaging, Radiography, Fluoroscopy, and Ultrasoundgraphy.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

AGNR 120 Integrated Pest Management (3.0 Units)

Students will learn the principles and concepts of managing Arthropods and certain relatives affecting food, plants, animals, people, and their structures. Emphasizing insects, mites, ticks, spiders, and miscellaneous related groups; their morphological and phylogenetic relationships; habits and habitats; affecting the well-being of people. Class focuses on pest identification and the introduces the practices of Integrated Pest Management.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 121 Introduction to Environmental Horticulture (3.0 Units)

Introduction to environmental horticulture with an emphasis on propagation, nursery operations and sales, landscaping and ecological restoration. Topics include: plant structure, physiology and identification, propagation, landscape design, seed management, soil analysis, integrated pest management, and career opportunities.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 122 Plant Propagation/Greenhouse Production (3.0 Units)

Students will explore the challenges of propagation and production of native and drought tolerant plants that are adapted to the extreme climate of the High Desert using techniques commonly used in a professional greenhouse environment. Topics include sexual and asexual propagation techniques. The nursery operations of growing structures; site layout; preparation of planting media are emphasized. C-ID: AG-EH 116 L.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 123 Introduction to Plant Science (4.0 Units)

An introduction to plant science with topics in plant structure, function and the environmental factors involved in plant growth and development. Students will learn: plant physiology; plant reproduction and propagation; effects of soil; water and climate; use of plants to meet human needs; sustainable horticultural practices; integrated pest management; the role of new technologies in contemporary plant science. C-ID: AG-PS 106 L., UC.

Lecture Hours: 54.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 131 Introduction to Soil Science (4.0 Units)

The study of soil derivation, classification, and characteristics. Soil use and management including erosion, moisture retention, structure, cultivation, organic matter and microbiology. Laboratory topics include soil type, classification, soil reaction, soil fertility and physical properties of soil. Laboratory included. C-ID: AG-PS 128 L.

Lecture Hours: 54.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 140 Plant Material and Usage I (3.0 Units)

Students will learn how to identify and use an array of plants appropriate for the climate of Southern California and the Mojave Desert. The growth habits and cultural requirements of drought tolerant landscape plants, vegetables, fruit trees, herbs, and houseplants will be discussed. This class is essential for landscape designers, installers and horticulturalists working in Southern California. C-ID: AG-EH 108 L.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 141 Plant Materials and Usage II (3.0 Units)

Students study the identification and usage of plants native to Southern California's mountains, deserts, & coastal areas. Emphasis will be placed on Mojave Desert native plants. Class will focus on the uses of these plants: commercially; for landscaping, in sustainable agriculture; fire ecology, land development; and ecological restoration. Class includes field trips to experience native plants in their natural environment. C-ID: AG-EH 112 L.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 150 Landscape Design (3.0 Units)

Fundamentals and history of landscape design. Study of color, texture, form and use of landscape material. Emphasis will be on selection and placement of plant material, walks, patios, decks and other structures for landscape use. Students design and draft actual landscape projects.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 152 Irrigation and Water Management (3.0 Units)

This course prepares students to design, install and maintain a water efficient irrigation system. Topics include water supply, basic hydraulics, component identification and terminology, system layout, pipe sizing, types of heads, valves, controllers, and practices related to appropriate horticulture and small scale agriculture in California.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 153 Natural Landscape Maintenance (3.0 Units)

This course prepares students to enhance the function and aesthetic value of public and private landscapes by applying appropriate maintenance techniques. Topics include plant selection, pruning, watering, soil fertility, pest management, weed control, and landscape maintenance business practices. Sustainable landscape practices will be emphasized throughout the course.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 160 Beginning Floral Design (3.0 Units)

An introduction to the fundamental theories, techniques and skills currently practiced in the floral industry. Includes applied art principles, cut flower care, handling practices, proper use of florist tools and materials, pricing of floral products and use of current floral business technology. Students construct corsages, floral arrangements, and foliage plant items, which meet floral industry standards.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 170 Environmental Science and Sustainability (4.0 Units)

A study of the applied natural sciences that support the sustainable use and conservation of the world's natural resources including: soil, water, forests, minerals, plant and animal life. Focused on implementing sustainability principles to balance environmental policy, economic stability and social equity to manage modern problems in resource use and global environmental issues. Emphasis on the the citizen's role in conservation with particular attention to California conditions.

Lecture Hours: 72.0; Lecture Hours: 4.5

Transfer: Transfers to both UC/CSU

AGNR 170L Environmental Science Laboratory**Laboratory 1/2laboratory (1.0 Units)**

Students gain hands-on skills and experience with the scientific concepts and appropriate technology that support environmental science and conservation. Students will be introduced to the fundamental issues in natural resource management and the agencies responsible for their sustainable management. The major natural resources of land, soils, water, air, biodiversity, renewable energy, and ecosystems, will be covered along with the sustainable practices needed for their management.

Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 171 Introduction to GIS in Natural Resources (3.0 Units)

Focus on electronic methods of cartography, including mapping concepts and methods in Agriculture and Natural Resource Management (AGNR) applications. This course covers the history, structure and uses of the basic operations of Geographic Information Systems (GIS), including hardware and software requirements. Introduction to other Geo-Spatial Applications and Geographic Positioning Systems.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to both UC/CSU

AGNR 172 Geospatial Technology (3.0 Units)

This course examines Geospatial Technologies, including Geographic Information Systems (GIS), in an interdisciplinary approach, supporting decision making in diverse natural resource scenarios. Drone technology, aerial photographs, Global Positioning Systems (GPS) and satellite imagery will be used to interpret, recognize and delineate vegetation types, land management practices, wildlife habitat, water resource management and other significant environmental parameters.

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

AGNR 173 Watershed Management and Restoration (3.0 Units)

An introduction to the methods, technology, and tools used to restore and enhance watershed health. This class focuses on water resource management in the West Mojave Desert and makes appropriate linkages to the critical nature of water management in California and around the world. Students explore the economic, political, social, and environmental pressures that must be balanced in providing sustainable water supplies. Students learn the scientific principles that support habitat restoration, groundwater management, soil erosion prevention, and water quality management.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

AGNR 175 Sustainable Agriculture, Environment And Society (3.0 Units)

This course explores how society is moving away from an industrialized to a sustainable agricultural model. Emphasis on sustainable agriculture's use of technology and the corresponding improvement of the health of the environment, economy, and society.

Lecture Hours: 54.0; Lecture Hours: 3.38

Transfer: Transfers to both UC/CSU

AGNR 177 Principles of Wildlife Management (3.0 Units)

The study of plant and animal ecology in relation to principles of wildlife management with an emphasis on identification, sexing and aging criteria, wildlife population dynamics, wildlife habitat, and a review of trapping and marking techniques. Students will be introduced to the principles of biodiversity management and the use of Geospatial Technologies to monitor wildlife populations.

Lecture Hours: 54.0; Lecture Hours: 3.38

Transfer: Transfers to CSU only

AGNR 178 Agriculture Economics (3.0 Units)

The place of agriculture and farming in the economic system; basic economic concepts, and problems of agriculture; pricing and marketing problems, factors of production; and state and federal farm programs affecting the farmer's economic position.

Lecture Hours: 54.0

Transfer: Transfers to both UC/CSU