Natural Resources Degree

Natural Resources is an interdisciplinary program that advances understanding of ecological systems and their interrelationships, including those with human society. Core study involves plant and animal ecology and natural history, field methods and study design, and conservation and management of ecosystems and natural resources. This program includes courses in a wide range of areas of environmental studies, and provides many unique opportunities for hands-on and real-world field experience and coursework.

Student Learning Outcomes

Upon completion of this program, the student will be able to:
- apply the scientific method and critical analysis to environmental investigations
- evaluate natural resource systems, including their past and present use and management and future sustainability
- analyze social, ethical, and biological implications of environmental management alternatives
- identify ecological phenomena in one’s everyday experiences and apply ecological principles to understand local, national, and global environmental issues
- assess the relationships of plants and animals to their environment and to each other
- measure and analyze the physical environment of plant and animal populations
- evaluate basic land survey, water quality, vegetation, and wildlife data
- examine the significance of biodiversity conservation

Requirements for Degree 42.5-44.5 Units

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>BIOL 305</td>
<td>Natural History</td>
<td>4</td>
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<tr>
<td>BIOL 310</td>
<td>General Biology</td>
<td>4</td>
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<tr>
<td>ENGR 44</td>
<td>Technical/Professional Communication: Writing Reports</td>
<td>1.5</td>
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<tr>
<td>GEOG 330</td>
<td>Introduction to Geographic Information Systems</td>
<td>5 - 6</td>
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<tr>
<td>and GEOG 334</td>
<td>Introduction to Desktop GIS</td>
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<tr>
<td>or CISC 300</td>
<td>Computer Familiarization</td>
<td>1</td>
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<tr>
<td>or CISC 315</td>
<td>Introduction to Electronic Spreadsheets</td>
<td>2</td>
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<tr>
<td>and CISC 305</td>
<td>Beginning Word Processing</td>
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<tr>
<td>or CISC 306</td>
<td>Intermediate Word Processing</td>
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<tr>
<td>GEOL 300</td>
<td>Physical Geography</td>
<td>3</td>
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<tr>
<td>or GEOG 300</td>
<td>Physical Geography: Exploring Earth’s Environmental Systems</td>
<td>3</td>
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<tr>
<td>NATR 300</td>
<td>Introduction to Natural Resource Management</td>
<td>3</td>
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<td>NATR 302</td>
<td>Introduction to Wildlife Biology</td>
<td>4</td>
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<tr>
<td>NATR 304</td>
<td>The Forest Environment</td>
<td>3</td>
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<tr>
<td>or NATR 311</td>
<td>Natural Resource Measurements-Land Surveying Methods</td>
<td>4</td>
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<tr>
<td>and NATR 312</td>
<td>Natural Resource Measurements-Field Methods and Study Design</td>
<td>1</td>
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<tr>
<td>and NATR 313</td>
<td>Natural Resource Measurements-vegetation Analysis and Forest Sampling</td>
<td>1</td>
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<tr>
<td>and NATR 314</td>
<td>Natural Resource Measurements-Aquatic Resource Sampling</td>
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Associate Degree Requirements: The Natural Resources Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Natural Resources Certificate

Requirements for Certificate 22 Units

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>NATR 300</td>
<td>Introduction to Natural Resource Management</td>
<td>3</td>
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<tr>
<td>NATR 302</td>
<td>Introduction to Wildlife Biology</td>
<td>4</td>
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<tr>
<td>NATR 304</td>
<td>The Forest Environment</td>
<td>3</td>
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<tr>
<td>or NATR 311</td>
<td>Natural Resource Measurements-Land Surveying Methods</td>
<td>4</td>
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<tr>
<td>and NATR 312</td>
<td>Natural Resource Measurements-Field Methods and Study Design</td>
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<td>Natural Resource Measurements-vegetation Analysis and Forest Sampling</td>
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<td>and NATR 314</td>
<td>Natural Resource Measurements-Aquatic Resource Sampling</td>
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NATR 294 Topics in Natural Resources .5-5 Units

Hours: 9-72 hours LEC; 27-54 hours LAB

Current topics in natural resources conservation and management not covered by regular catalog offerings are examined. Topics and field locations vary. Course topics may include but are not limited to: advanced subjects related to wildlife, fisheries, soil and water resources, conservation biology, forest resources and management, restoration ecology and aquatic ecology. Field trips may be required. This course may be taken four times on different topics.

NATR 300 Introduction to Natural Resource Conservation and Policy 4 Units

General Education: AA/AS Area IV
Course Transferable to UC/CSU
Hours: 72 hours LEC

This course provides a survey of concepts, issues, laws and regulations relevant to natural resources, such as soils, water, wildlife, fisheries, rangelands, and forests, with a focus on their sustainable management and conservation. Overexploitation, pollution, land use, and waste issues are integrated throughout the course. Principles, problems, and solutions are explored in the context of economics, ethics, and past, present, and future natural resource issues. Critical thinking and ecological dynamics are stressed. Sustainability, global environmental problems, and energy are major themes. It also examines the environmental regulatory process in California. Federal and California environmental laws are studied and discussed. Field trips may be required.
NATR 302 Introduction to Wildlife Biology 4 Units
General Education: AA/AS Area IV
Course Transferable to UC/CSU
Hours: 54 hours LEC, 54 hours LAB
This course is an introduction to wildlife biology and the basic principles and techniques related to the practice of wildlife management. It emphasizes ecological principles of populations and communities as they relate to the interdependence of wildlife and human populations. Topics include the social, political and biological implications of wildlife management. Game, non-game, threatened and endangered, and invasive species of wildlife are explored. Additionally, this course covers habitat and population sampling, radio telemetry, and the development of a wildlife management plan. Field trips are required.

NATR 303 Energy and Sustainability 3 Units
Same As: ENERGY 303 and ET 303
General Education: AA/AS Area IV
Course Transferable to CSU
Hours: 54 hours LEC
Fundamentals of energy and its impact on society and the environment are covered in this course. The mechanics, advantages and disadvantages of current and future renewable, green and non-renewable energy sources are investigated. Residential energy audits are covered. Field trips are required. This course is not open to students who have completed ENERGY 303 or ET 303.

NATR 304 The Forest Environment 3 Units
General Education: AA/AS Area IV
Course Transferable to UC/CSU
Hours: 54 hours LEC
This course covers basic biological and physical science concepts important to a general understanding of forest ecology and forestry. Forest history, forests of the United States, general tree taxonomy, forest ecology, soils, silvics, and insects and diseases of forest trees are investigated. Additional topics include the role of fire in forest management, forest measurements, multiple use management, and current forest issues and policies related to forest resource use. Field trips are required.

NATR 305 Fisheries Ecology and Management 4 Units
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
This course covers the fundamentals of marine and freshwater fisheries and their impacts on society and the environment. Fisheries sustainability issues are investigated, including environmental, ecological, economic, and social aspects. Commercial and recreational fisheries management and aquaculture, including fish farming and fish ranching, are covered. Field trips are required.

NATR 306 Introduction to Rangeland Ecology and Management 3 Units
Course Transferable to CSU
Hours: 36 hours LEC, 54 hours LAB
This course introduces the science of range ecology and management. Current issues and recent research in rangeland management are discussed, as well as the history of rangelands and their management. This course focuses on the effects of different grazing systems on rangeland ecosystems, ecophysiology of range plants, ruminant nutrition, multiple-use management, rangelands in developing countries, and future trends in range management. In addition, inventory, monitoring, and manipulation of range vegetation are explored. Field trips are required.

NATR 307 Principles of Sustainability 4 Units
General Education: AA/AS Area V(b)
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
Theoretical and practical aspects of sustainability are explored including social, economic, and environmental dimensions. Sustainable principles and practices are examined in the context of energy production and consumption, transportation systems, food production, water resources, industry, and the built environment. The environmental as well as social and cultural impact of industrialization is addressed, and solutions to current problems are discussed. Field trips may be required.

NATR 310 Natural Resource Measurements 4 Units
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
This course provides basic natural resource measurement and survey skills. Included are elementary surveying, public land surveying, distance and direction measurement, topographic map reading, stream flow measurement, basic aquatic and water quality sampling. It focuses on forest and herbaceous vegetation sampling techniques such as transects and quadrates. Also included are the fundamentals of wildlife sampling techniques such as radio telemetry, population sampling techniques, Global Positioning Systems (GPS), Geographic Information Systems (GIS), and use of the internet as a research tool. Field trips are required.

NATR 320 Principles of Ecology 4 Units
General Education: AA/AS Area IV, CSU Area B2; CSU Area B3; IGETC Area 5B
Course Transferable to UC/CSU
Hours: 54 hours LEC, 54 hours LAB
This course covers basic principles of ecology, including the physical and biological factors of different environments in relation to the distribution and abundance of plants and animals. Emphasis is on the management of ecosystems using ecological principles and the understanding of current ecological issues. Field trips are required.

NATR 325 Black Bear Ecology and Management in California 2 Units
Course Transferable to CSU
Hours: 27 hours LEC, 27 hours LAB
This course explores the natural history, habitat, and management of the black bear. Topics include the distribution, abundance, physiology, reproduction, and behavior of black bears. A field trip into black bear country is required to allow observation of bear sign and appreciation of the natural habitat of this animal.

NATR 326 Analysis of a Predator-The Mountain Lion 1.5 Units
Course Transferable to CSU
Hours: 27 hours LEC
This course explores the natural history and political history of the mountain lion. Topics include the distribution and abundance of mountain lions in California and throughout western North America; the important ecological role of these predators; problems associated with mountain lions, and the legal status of mountain lions in California. A field trip into mountain lion country is required to allow observation of lion sign and appreciation of the natural habitat of this predator.
NATR 330  Native trees and shrubs of California  
4 Units

General Education: AA/AS Area IV  
Course Transferable to UC/CSU  
Hours: 54 hours LEC; 54 hours LAB  
This dendrology course covers classification and ecology of major natural plant communities of California and their tree and shrub component species. It focuses on characterization of the dominant vegetation types and identification of native woody species using plant keys and sight identification. Topics include natural history and life cycle, physiology, evolution, and human uses of --and threats to-- California plant communities and individual species. The course involves the creation of a plant collection including at least 60 representative native woody species. Field trips are required.

NATR 332  Wildflowers of California  
3 Units

Advisory: NATR 330  
General Education: AA/AS Area IV  
Course Transferable to UC/CSU  
Hours: 36 hours LEC; 54 hours LAB  
This course investigates ecology and identification of the wildflowers of California. Field labs focus on the California Floristic Province. The identification, distribution, and interrelationships of herbaceous plants in their natural environment, physical and biological influences, ecological relationships, and representative plant communities are examined. Special emphasis is given to the study of plant families in our local grasslands, vernal pools, oak woodlands, and foothills. Field trips may be required.

NATR 340  John Muir "Conservationist"  
2 Units

Course Transferable to CSU  
Hours: 36 hours LEC  
This course covers the life, writings, and philosophy of John Muir, one of the founders of the American Conservation Movement. It focuses on his significant contributions to the formation of the National Park System. This course is recommended for elementary and secondary educators and those interested in natural resources, conservation, and California history. Field trips are required.

NATR 498  Work Experience in Natural Resources  
1-4 Units

Advisory: ENGWR 102 or 103, and ENGRD 116 with a grade of "C" or better; OR ESLR 320 and ESLW 320 with a grade of "C" or better; OR placement through assessment process.  
General Education: AA/AS Area III(b)  
Enrollment Limitation: Be in a paid or non-paid internship, volunteer opportunity or job related to natural resources. Students are advised to consult with the Natural Resources Department faculty to review specific certificate and degree work experience requirements.  
Course Transferable to CSU  
Hours: 60-300 hours LAB  
This course provides students with opportunities to develop marketable skills in preparation for employment or advancement within the field of natural resources. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student’s progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to fulfill a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. The weekly orientation is required for first time participants, returning participants are not required to attend the orientation but are required to meet with the instructor as needed to complete all program forms and assignments. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives.