ENVIRONMENTAL SCIENCES
MAJOR: ECOSYSTEMS
OPTION (B.S.)

https://colsa.unh.edu/natural-resources-environment/program/bs/environmental-sciences-major-ecosystems-option

Description

The College of Life Sciences and Agriculture (COLSA) and the College of Engineering and Physical Sciences (CEPS) jointly offer a bachelor of science degree in environmental sciences. Environmental science is an interdisciplinary field concerned with the interaction of biological, chemical, and physical processes that shape the environment, and control the response of natural systems to human activities. Students graduating with a degree in environmental sciences will have an understanding of these interacting processes, experience working in interdisciplinary teams to apply this understanding, and the ability to communicate effectively with both scientific and lay audiences. While in this program, students will acquire significant experience with field, laboratory and analytical methods appropriate for employment in professional environmental science positions as well as a basic understanding of environmental policy. The University of New Hampshire is a recognized leader in environmental sciences research, and the environmental sciences program capitalizes on faculty expertise in this area. Program faculty emphasize teaching and research in the areas of biogeochemical cycling, environmental chemistry, ecosystem science, global change, hydrology, plant ecology, soil science, and water resource management among many other fields.

Employment opportunities include environmental consulting firms; educational facilities (e.g., science centers), environmental monitoring laboratories (e.g., water treatment plants, the Environmental Protection Agency), government agencies (e.g., the U.S. Geological Survey, Bureau of Land Management, Natural Resource Conservation Service), university and government research laboratories, and nonprofits in various fields. The environmental sciences program also constitutes an excellent preparation for graduate programs in several areas relating to the environment.

The Program has four options, and specific course requirements for the major vary by option. The ecosystems and soils and watersheds options are both managed by the Department of Natural Resources and the Environment in COLSA, and the geosystems and hydrology options are both managed by Earth Sciences in CEPS.

Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Scope of the Major (Introduction - 3 Courses)</td>
<td>9</td>
<td></td>
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<tr>
<td>NR 400</td>
<td>Professional Perspectives in Natural Resources</td>
<td></td>
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<tr>
<td>NR 403</td>
<td>Introduction to Environmental Science</td>
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<tr>
<td>NR 435</td>
<td>Contemporary Conservation Issues and Environmental Awareness</td>
<td></td>
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<tr>
<td>or NR 437</td>
<td>Principles of Sustainability</td>
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<tr>
<td>The Scientific Basis (Foundation - 7 Courses)</td>
<td>28</td>
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Biology I:
BIOL 412 Introductory Biology: Evolution, Biodiversity and Ecology

Biology II:
NR 439 Environmental Biology
or BIOL 411 Introductory Biology: Molecular and Cellular

Chemistry I:
CHEM 403 General Chemistry I
or CHEM 405 Chemical Principles for Engineers
or CHEM 411 Introductory Chemistry for Life Sciences

Chemistry II:
NR 561 Chemistry of the Environment
or CHEM 404 General Chemistry II

Physics:
PHYS 401 Introduction to Physics I
or PHYS 407 General Physics I

Calculus:
MATH 424B Calculus for Life Sciences
or MATH 425 Calculus I

Statistics:
BIOL 528 Applied Biostatistics I
or EREC 525 Statistical Methods and Applications

Earth and its Systems (Core - 6 Courses) 24
Earth Science:
ESCI 401 Dynamic Earth
or ESCI 402 Earth History
or ESCI 409 Geology and the Environment

Aquatic Science:
NR 504 Freshwater Resources

Soils:
NR 501 Studio Soils

Climate/Weather:
ESCI 514 Introduction to Climate
or GEOG 473 Elements of Weather
or GEOG 670 Climate and Society

Ecology:
NR 527 Forest Ecology
or BIOL 541 Ecology

Human Dimensions:
NR 602 Natural Resources and Environmental Policy
or NR 662 Environmental Policy, Planning and Sustainability in New Zealand
or NR 507 Introduction to our Energy System and Sustainable Energy
or NR 784 Sustainable Living - Global Perspectives

Environmental Toolkit (Methods - 2 Courses) 7-8
Select two courses from the following:
ESCI 534 Techniques in Environmental Sciences
NR 658 Introduction to Geographic Information Systems
or ESCI 777 GIS for Earth & Environmental Sciences
NR 757 Remote Sensing of the Environment
ESCI 778 Remote Sensing Earth & Environmental Sciences
NR 713 Quantitative Ecology
### Ecosystem Integration (Advanced Topics - 4 Courses) 16

**Population and Community Ecology:**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>NR 765</td>
<td>Community Ecology</td>
</tr>
<tr>
<td>or NR 734</td>
<td>Tropical Ecology</td>
</tr>
<tr>
<td>or NR 706</td>
<td>Soil Ecology</td>
</tr>
<tr>
<td>or NR 660</td>
<td>Ecology and Biogeography of New Zealand</td>
</tr>
<tr>
<td>or NR 640</td>
<td>Wildlife Population Ecology</td>
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<tr>
<td>or NR 642</td>
<td>Introduction to Biogeography</td>
</tr>
<tr>
<td>or NR 603</td>
<td>Landscape Ecology</td>
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<tr>
<td>or BIOL 720</td>
<td>Plant-Animal Interactions</td>
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**Ecosystems:**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>NR 730</td>
<td>Terrestrial Ecosystems</td>
</tr>
<tr>
<td>or NR 751</td>
<td>Aquatic Ecosystems</td>
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<tr>
<td>or NR 661</td>
<td>Restoration Ecology and Ecosystem Management in New Zealand</td>
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**Biogeochemistry:**

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<tr>
<td>NR 744</td>
<td>Biogeochemistry</td>
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<tr>
<td>or NR 761</td>
<td>Environmental Soil Chemistry</td>
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<tr>
<td>or NR 703</td>
<td>Watershed Water Quality Management</td>
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<tr>
<td>or ESCI 642</td>
<td>Biogeo sciences in the Earth System</td>
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**Environmental Problem Solving:**

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<tr>
<td>ESCI 654</td>
<td>Fate and Transport in the Environment</td>
</tr>
<tr>
<td>or NR 707</td>
<td>Environmental Modeling</td>
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<tr>
<td>or EREC 760</td>
<td>Ecological-Economic Modeling for Decision Making</td>
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<tr>
<td>or NR 749</td>
<td>Forest Inventory and Modeling</td>
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### Integration and Research (The Capstone Experience)

**Capstone:**

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>NR 663</td>
<td>Applied Directed Research in New Zealand</td>
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<tr>
<td>or NR 786</td>
<td>Leadership for Sustainability</td>
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<tr>
<td>or NR 795</td>
<td>Investigations</td>
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<tr>
<td>or NR 799</td>
<td>Honors Senior Thesis</td>
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Every student must complete a capstone experience senior year, or during the summer before senior year if at least 90 credit hours have been completed. A Contract form provided by the Program must be completed and signed by the student, the adviser, and the capstone mentor (faculty or off-campus) by the end of Junior Year.

**Total Credits**: 84-85

NR 791 Preparation for Capstone is offered every spring. While not required for graduation, it is recommended for second semester juniors who need guidance in terms of developing a capstone project and completing the Capstone Contract.