

## ENVIRONMENTAL SCIENCES IN THE RUBENSTEIN SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES

<http://www.uvm.edu/rsenr/environmentalsciences>

The interdisciplinary Environmental Sciences major combines a natural science-based curriculum with hands-on experience needed to identify, analyze, and solve environmental problems. Blending hands-on field and laboratory instruction with real-world environmental internship, research, and study abroad opportunities, students acquire the skill set needed to tackle complex environmental problems. With the School's emphasis on such cutting-edge areas as ecological design, restoration of damaged ecosystems, geospatial technologies and environmental assessment, Environmental Sciences graduates are equipped with the knowledge to protect the health and integrity of our terrestrial, aquatic, and urban ecosystems.

All environmental science majors take a common set of courses in biology, chemistry, mathematics, and geology or plant and soil science. A common set of environmental science core courses is followed by specialization in one of nine concentrations:

- Agriculture and the Environment
- Conservation Biology and Biodiversity
- Ecological Design
- Environmental Analysis and Assessment
- Environmental Biology
- Environmental Geology
- Environmental Health
- Global Environmental and Climate Change
- Water Resources
- Self-Designed Concentration

Goals of the major include providing students with a strong foundation in basic sciences as well as advanced knowledge in environmental sciences; emphasizing scientific analysis aimed at assessment and remediation of environmental problems; familiarizing students with sources and measurements of pollutants and movement through ecosystems; and providing practical experience in environmental sciences through internships/service learning and research.

### MAJORS

#### ENVIRONMENTAL SCIENCES MAJOR

Environmental Sciences B.S.

### Courses

#### **ENSC 1010. Intro Environmental Sci. 3 Credits.**

Explores the complex interactions between humans and environmental systems and the ecological foundations and scientific principles to better understand how the coupled human-natural system works, and how science can be used to help solve environmental problems. Catamount Core: N1, SU.

#### **ENSC 1090. Orientation to Env Sciences. 1 Credit.**

Introduces new majors to the discipline, major, and profession through advising exercises, guest lectures, panel discussions and skills practice. Provides a foundation of common disciplinary frameworks and methodologies to support students in major coursework. Prerequisites: First-Year Rubenstein School of Environment and Natural Resources Environmental Science major.

#### **ENSC 1490. Climate Change I. 3 Credits.**

Explores how and when climate has changed over time and its impact on people and ecosystems; how humans have altered Earth's climate historically; how climate will change in the future; and implications for people and planet. Learn to communicate about climate change and take action. Credit not awarded for both ENSC 1490 and ENSC 2490. Catamount Core: N1, SU.

#### **ENSC 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

#### **ENSC 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

#### **ENSC 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

#### **ENSC 2300. Global Environmental Assessmnt. 0 or 3 Credits.**

Introduction to skills for assessing human impacts on the global environment. Theory and application of GPS, geographic information systems and satellite remote sensing to address key environmental issues. Prerequisites: ENSC 1010, ENVS 1500, GEOG 1200, NR 1010, NR 1090, or Geospatial Technologies minor.

#### **ENSC 2480. Global Environmental Change. 3 Credits.**

Explores changes in natural processes and anthropogenic activities that influence the atmosphere, hydrosphere, and biosphere individually and through interactions and feedbacks from a distinctly spatial perspective employed by physical geographers. Prerequisites: GEOG 1200 or ENSC 1010. Cross-listed with: GEOG 2250.

**ENSC 2490. Climate Change II. 1 or 3 Credit.**

Advanced exploration of how and when climate changed over time; impact on people and ecosystems; how humans have altered Earth's climate historically; how climate will change in the future; what this implies for people and planet. Learn to communicate about climate change and take action. Credit not awarded for both ENSC 1490 and ENSC 2490. Prerequisites: One class in physical or natural sciences or engineering. Catamount Core: N1, N2, SU.

**ENSC 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**ENSC 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion. Maximum of six hours. Three can be applied to elected concentration with Director permission.

**ENSC 2993. Independent Study. 1-18 Credits.**

Tailored to the interests of a specific student, occurs outside the traditional classroom/laboratory setting under faculty supervision, for which credit is awarded. Offered at department discretion. Up to six hours. Three can be applied to elected concentration with Director permission.

**ENSC 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**ENSC 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Up to six hours. Three can be applied to elected concentration with Director permission.

**ENSC 3600. Pollutant Mvmt/Air, Land & Water. 0 or 4 Credits.**

Physical, chemical, and biological aspects of pollutant behavior from source to ultimate fate. Laboratory methodologies for measuring pollutants and predicting their transport, behavior, and fate. Prerequisites: CHEM 1400, CHEM 1450, MATH 1212 or MATH 1234; MATH 1224 or MATH 1248; Environmental Sciences major.

**ENSC 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles. Prerequisite: Senior standing.

**ENSC 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**ENSC 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ENSC 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**ENSC 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ENSC 3996. Environmental Sciences Honors. 1-6 Credits.**

Honors project dealing with environmental sciences. Not approved for Graduate credit.

**ENSC 4010. Recovery & Restor Altered Ecosys. 0 or 4 Credits.**

Role of stress and disturbance and the natural process of recovery in aquatic and terrestrial ecosystems. Human efforts to modify, restore, and remediate altered ecosystems. Prerequisites: NR 2030 or BCOR 2100; ENSC majors or Instructor permission. Catamount Core: GC2.

**ENSC 4020. Applied Envir Assess Analysis. 0 or 4 Credits.**

Approaches used to identify, evaluate, and manage environmental risks. Focus on interactions among ecological, economic, and social considerations; often utilizing a watershed perspective. Problem formulation, methods selection. Case studies. Project-oriented. Prerequisites: Senior standing; Environmental Sciences major.

**ENSC 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**ENSC 4996. Environmental Science Honors. 1-6 Credits.**

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion. Prerequisites: Senior standing; Instructor permission.