

ENVIRONMENTAL CONSERVATION AND SUSTAINABILITY MAJOR (B.S.)

<https://colsa.unh.edu/natural-resources-environment/program/bs/environmental-conservation-sustainability-major>

Description

ECS Major Curriculum

The ECS major is comprised of 14 core requirements providing integrative courses in both environmental conservation and sustainability, along with a foundation in biology, ecology, physical and social science, and the basic tools and skills applied to problem solving. These core requirements are typically fulfilled in the first two years. Beginning in their junior year, ECS students, in consultation with their advisers, create a seven course focus area based on an ecological system or natural resource of their choosing. The focus area provides advanced study in ecology and natural resources; social sciences; tools, skills, and/or natural history and should reflect the student's interests and future goals. Additionally, each ECS student completes a practicum experience and a capstone option.

The ECS major provides the opportunity for students to gain a common foundation of knowledge and skills emphasizing integration and critical thinking, while allowing for sufficient flexibility to pursue their interests and passions within a large and complex field of study. The design of the curriculum will allow each student at least four, and as many as six, free electives, which they may fulfill as they choose. Many students pursue international experiences, such as the UNH EcoQuest program in New Zealand, add a minor or dual degree (such as the dual degree in international studies), and/or pursue research opportunities with our faculty or through another of UNH's undergraduate research opportunity programs.

Requirements

ECS Major Requirements

Code	Title	Credits
Degree Core Requirements		
Foundational Courses:		
NR 435	Contemporary Conservation Issues and Environmental Awareness	
NR 437	Principles of Sustainability	
Natural Science:		
Biology:		
BIOL 412	Introductory Biology: Evolution, Biodiversity and Ecology	
NR 439	Environmental Biology	
Ecological Principles: Select one of the following		4
BIOL 541	Ecology	
NR 527	Forest Ecology	
SAFS 502	Agroecology	
Physical Science: Select one of the following		4
NR 403	Introduction to Environmental Science	
NR 458	The Science of Where	
CHEM 403	General Chemistry I	
CHE 410	Energy and Environment	

ESCI 409	Geology and the Environment	
CEE 520	Environmental Pollution and Protection: A Global Context	
PHYS 401	Introduction to Physics I	
Social Science:		
Resource Economics:		
EREC 411	Environmental and Resource Economics Perspectives	
Environmental Ethics and Values: Select one of the following		4
NR #701	Ecological Sustainability and Values	
NR 784	Sustainable Living - Global Perspectives	
SOC 565	Environment and Society	
Natural Resources Policy: Select one of the following		4
NR 602	Natural Resources and Environmental Policy	
NR 662	Environmental Policy, Planning and Sustainability in New Zealand	
Essential Tools and Skills:		
Field Methods:		
NR 415	Natural Resources Field Methods	
Statistics: Select one of the following		4
BIOL 528	Applied Biostatistics I	
EREC 525	Statistical Methods and Applications	
Geospatial Analysis:		
NR 658	Introduction to Geographic Information Systems	
Writing Skills: Select one of the following		4
ENGL 502	Professional and Technical Writing	
ENGL 503	Persuasive Writing	
ENGL 521	Nature Writers	
Presentation Skills: Select one of the following		4
CMN 500	Public Speaking	
NR 508	Presenting Science to the General Public	
THDA #520	Creative Drama	
THDA 583	Introduction to Puppetry	
THDA 522	Storytelling, Story Theatre, and Involvement Dramatics	
THDA 624	Theatre for Young Audiences	
Focus Area		
Select seven total courses to create a focus area addressing an environmental issue, ecological system, or natural resource (see below) ¹		28
Ecology and Natural Resources:		
Select one to four courses: no more than one course may be at the 400 or 500 level. Additional courses must be at the 600 or 700 levels.		
ESCI 405	Global Environmental Change	
MEFB 755	Biological Oceanography	
NR 433	Wildlife Ecology	
NR 501	Studio Soils	
NR 502	Forest Ecosystems and Environmental Change	
NR 504	Freshwater Resources	
NR 603	Landscape Ecology	
NR 625	Physiological Ecology	
NR 640	Wildlife Population Ecology	
NR 642	Introduction to Biogeography	
NR 650	Principles of Conservation Biology	
NR 660	Ecology and Biogeography of New Zealand	
NR 661	Restoration Ecology and Ecosystem Management in New Zealand	
NR 663	Applied Directed Research in New Zealand	
NR 664	Conservation Genetics	
NR 706	Soil Ecology	
NR #711	Wetland Ecology and Management	
NR 730	Terrestrial Ecosystems	
NR 734	Tropical Ecology	
NR 743	Ecology and Society in a Changing Arctic	
NR 744	Biogeochemistry	
NR 751	Aquatic Ecosystems	
NR 761	Environmental Soil Chemistry	
NR 765	Community Ecology	
NR 782	Forest Health in a Changing World	
MEFB 717	Lake Ecology	
MEFB 725	Marine Ecology	
MEFB 747	Aquatic Plants in Restoration/Management	
SAFS 760	Insect Pest Management	
MEFB 628	Marine Invertebrate Evolution and Ecology	

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MEFB 674	Ecology and Marine Environment
MEFB 702	Sustainable Marine Fisheries
MEFB 772	Fisheries Biology: Conservation and Management

Social Sciences

Select two to five courses: no more than one course may be at the 400 or 500 level. Additional courses must be at the 600 or 700 levels.

CEP 415	Community Development Perspectives
CEP 508	Applied Community Development
NR 507	Introduction to our Energy System and Sustainable Energy
NR 606	International Energy Topics
NR 643	Economics of Forestry
NR 662	Environmental Policy, Planning and Sustainability in New Zealand
NR #701	Ecological Sustainability and Values
NR 720	International Environmental Politics and Policies for the 21st Century
NR 724	Resolving Environmental Conflicts
NR 784	Sustainable Living - Global Perspectives
NR 787	Advanced Topics in Sustainable Energy
ANTH 695	Globalization and Global Population Health
CEP 614	Fundamentals of Planning
CEP 673	Green Real Estate
ECON 605	Intermediate Microeconomic Analysis
ECON 645	International Economics
ECON 668	Economic Development
ECON 706	Economics of Climate Change
EREC 572	Introduction to Natural Resource Economics
EREC 606	Land Economics Perspectives: Uses, Policies, and Taxes
EREC 627	Community Economics
EREC 680	Agricultural and Food Policy
EREC 708	Environmental Economics
EREC 756	Rural and Regional Economic Development
GEOG 673	Political Ecology
HIST 618	American Environmental History
POLT 751	Comparative Environmental Politics and Policy
SOC #665	Environmental Sociology
SOC 730	Communities and the Environment
TOUR 400	Introduction to Tourism

Advanced Tools & Skills and Natural History

Select at least one course

NR 425	Field Dendrology
NR 655	Vertebrate Biology
NR 703	Watershed Water Quality Management
NR 707	Environmental Modeling
NR 712	Mammalogy
NR 713	Quantitative Ecology
NR 729	Silviculture
NR 745	Forest Management
NR 749	Forest Inventory and Modeling
NR 757	Remote Sensing of the Environment
NR 759	Digital Image Processing for Natural Resources
NR 760	Geographic Information Systems in Natural Resources
NR 785	Systems Thinking for Sustainable Solutions
SOC 601	Methods of Social Research
BIOL 752	New England Mushrooms: a Field and Lab Exploration
CEP 777	Topics in Community Planning
TOUR 767	Social Impact Assessment
MEFB 719	Field Studies in Lake Ecology
MEFB #732	Lake Management
ZOOL 542	Ornithology

Senior Capstone Options

The ECS major capstone experience may be filled by any one (1) of the following options: 4

Option 1:	
NR 786	Leadership for Sustainability
Option 2: Both seminars must be scheduled. At least one must be taken in the senior year.	
NR 753 & NR 754	Critical Issues in Sustainability: Sustainability as an Abundance Paradigm and Critical Issues in Sustainability: Sense of Place
Option 3:	
NR 663	Applied Directed Research in New Zealand (NZ Directed projects, if taken in the senior year) ²
Option 4:	

Directed projects fulfilling one of the following: McNair Research Theses, Hamel Center Programs (IROP, SURF USA, SURF Abroad, etc.) may be applied in consultation with the adviser and ECS program coordinator.

Work Experience

NR 600	Work Experience ³
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Total Credits 60

- ¹ The focus area is based upon at least one course in the ecology and natural resources category, along with a combination of courses in the social sciences; tools, skills, and natural history categories; and any additional courses from the ecology and natural resources category reflecting the student's interests and future direction. Focus areas should be designed in close consultation with the adviser. Courses used to fulfill core requirements may not be used in the focus area.
- ² If NR 663 Applied Directed Research in New Zealand is taken in the junior year or earlier, then one Critical Issues seminar (2cr) or Leadership for Sustainability must be taken in the senior year to fulfill the capstone requirement.
- ³ Each ECS major will engage in a practical experience reflecting their interests and goals. The choice of the experience will be made in conjunction with the adviser and may occur any time beginning with the sophomore year.

Degree Plan

Sample Course Sequence for Environmental Conservation and Sustainability

Course	Title	Credits
First Year		
Fall		
BIOL 412	Introductory Biology: Evolution, Biodiversity and Ecology (Inquiry, Disc BS)	4
NR 435	Contemporary Conservation Issues and Environmental Awareness (Disc ETS)	4
EREC 411	Environmental and Resource Economics Perspectives (or Discovery Course, not SS or ETS)	4
ENGL 401 or Discovery Course		4
Credits		16
Spring		
NR 437	Principles of Sustainability	4
NR 439	Environmental Biology	4
EREC 411	Environmental and Resource Economics Perspectives (or Discovery Course, not SS or ETS)	4
ENGL 401 or Discovery Course		4
Credits		16
Second Year		
Fall		
NR 415	Natural Resources Field Methods	2
Ecological Principles ¹		4
Physical Science (Disc PS) ²		4
Presentation Skills (possible Disc FPA) ²		4
Practicum ³		0

Elective	4
Credits	18
Spring	
Statistics (Disc QR) ²	4
Writing Skills (Univ. writing req.) ²	4
NR 658 Introduction to Geographic Information Systems	4
NR 602 or Discovery Course	4
Credits	16
Third Year	
Fall	
NR 602 or Discovery Course	4
Ethics/Values Requirement	4
Focus Area Courses	8
OR Electives	
OR any remaining Discovery or WI requirement	
OR Capstone ⁴	
Credits	16
Spring	
Focus Area Courses ⁵	16
OR Electives	
OR any remaining Discovery or WI requirements	
OR Capstone ⁴	
Credits	16
Fourth Year	
Fall	
Capstone Requirement ⁵	2-4
Focus Area Courses	12
OR Electives	
OR any remaining Discovery of WI requirements	
Credits	14-16
Spring	
Capstone Requirement ⁵	2-4
Focus Area Courses	12
OR Electives	
OR any remaining Discovery of WI requirements	
Credits	14-16
Total Credits	126-130

Student Learning Outcomes

Students will be able to:

- Evaluate the validity and limitations of scientific theories and claims about the environment;
- Describe and explain the interactions among physical, biological, chemical, and human components of the environment;
- Formulate tests of environmental questions, acquire data, and apply scientific methods to answer these questions;
- Characterize the various social drivers of environmental problems and the relative attributes of policy instrument solutions;
- Locate, evaluate, and summarize print and electronic media including peer-reviewed literature and then compose and deliver informed positions on current environmental problems to the public.
- Describe and explain the ecological and societal value of biodiversity, sustainability, and environmental stewardship;
- Master mathematical, statistical, and study design knowledge and skills, and use state-of-the-art software, hardware, and analytical techniques relevant to environmental conservation and sustainability;
- Use principles of ecology, economics, sustainability, and policy science to solve real-world environmental problems;
- Communicate effectively to peers within the environmental community and with audiences outside of the discipline.

¹ All choices for the Ecological Principles requirement **except** for SAFS 502 are fall courses.

² The Statistics, Physical Science, Writing Skills and Presentation Skills requirements may be taken in either the Fall or Spring Semester of the second year.

³ Work experience, internship, etc may be scheduled any time beginning in the second year.

⁴ One of the 2 credit capstone seminars may be taken in either the fall or spring of the junior year.

⁵ One 2 credit seminar may be taken in each of the Fall and Spring semesters of the Senior Year OR NR 786 may be taken in the Fall semester of the Senior Year.