

B.S. IN ENVIRONMENTAL SCIENCE

The mission of Environmental Science (<https://www.bethel.edu/undergrad/academics/biology/majors-minors/environmental-science-major/>) at Bethel is to guide students in the pursuit of truth about the workings of creation and the human place in it, and to enable them to practice environmental stewardship in lifestyle and profession. Caring for the whole of creation is an immense privilege and responsibility, and we prepare students for this task through a curriculum that integrates knowledge and perspective from a variety of established disciplines (e.g., biology, chemistry) as well as off-campus experiences. Environmental science combines classroom and laboratory instruction with a variety of field experiences. Students cap their education in environmental science by designing and conducting a specific research project under the direction of a faculty mentor or arranging an internship related to their specific area of interest. Those who complete the program successfully will be prepared for a variety of types of employment (e.g., natural resource conservation, outdoor education, environmental advocacy) or for graduate school. The number of such opportunities is continually increasing as is the need for educated, committed environmental stewards.

Major in Environmental Science

- Environmental Science (<http://catalog.bethel.edu/arts-sciences/academic-programs-departments/environmental-studies/environmental-science-bs/>)

AUS 301 • Geographic Information Systems 4 Credits

Theory and application of GIS (map types and projections, symbology, classification, analysis, and web mapping applications) for applied social and ecological problem-solving. Provides students the skills and confidence to conduct their own field studies, do spatial analysis, and create their own maps and visualizations.

Offered: Summer.

AUS 302 • Field Botany 4 Credits

Field identification and ecology of vascular plants as components of natural communities, with emphasis on field examination of plants in regional communities and associated ecological features such as community stratification and plant zonation along ecological gradients.

Offered: Summer.

AUS 303 • Au Sable Field Course: Wetland Techniques 4 Credits

A comprehensive overview of wetland ecosystem processes, values, legislation and quantification. Students learn to evaluate soils, hydrology and vegetation of wetland systems and obtain certification as wetland delineators following USACoE standards.

Offered: Summer.

ENS 100 • Environmental Studies 3 Credits

Examination of how science, engineering, and economics work together to address and solve environmental problems. Exploration of the importance of the scientific method as it relates to the environment, conservation of resources, and energy. Evaluation of case studies will develop a deeper sense of stewardship to our planet.

Offered: Fall, Spring.

ENS 104 • Environment and Humanity 3 Credits

Interrelationships and interactions of humans with the natural environment in which they live. Causes of and potential solutions to environmental problems like pollution of water, air, and soil; extinction of wildlife; and degradation of natural and human ecosystems are examined, using the science of ecology as a knowledge base.

Corequisites: Concurrent registration in ENS 104D is required. Offered: Fall, Spring.

ENS 104D • Environment and Humanity Lab 1 Credit

Laboratory experience accompanying ENS 104. Includes some outdoor and off-campus investigations.

Corequisites: Concurrent registration in ENS 104 or completion of ENS 100. Offered: Fall, Spring.

B.S. in Environmental Science 2

ENS 205L • Sustainable Living 4 Credits

A multidisciplinary approach to the challenges of living a sustainable life in a complex world. Considers how ecological, ethical, and cultural understandings inform our responsibility for personal and global decisions.

Prerequisites: GES 130 and GES 160 (may be taken concurrently) or GES 149 (may be taken concurrently).

Offered: Spring.

ENS 316 • Wildlife Ecology and Management 3 Credits

Analysis of terrestrial vertebrate populations, communities, and habitats. Exploration of how these analyses are applied to the manipulation, exploitation, protection, and restoration of animal populations and communities.

Prerequisites: BIO 218 (may be taken concurrently) and junior or senior standing. Corequisites: Concurrent registration in ENS 317 is required. Offered: Spring, even # years. Special Notes: This course carries cross-credit in biology.

ENS 317 • Wildlife Ecology and Management Lab 1 Credit

Laboratory experience accompanying ENS 316. Includes some outdoor and off-campus investigations.

Corequisites: Concurrent registration in ENS 316 is required. Offered: Spring, even # years. Special Notes: This course carries cross-credit in biology.

ENS 318KZ • Ecology in the Tropics: Natural History and Future Prospects 4 Credits

Travel in Ecuador or Kenya surveying the land, climate, plans, animals, homes, transportation, and industries, noting especially the impact of human presence. Kenya includes Nairobi, African savanna, the Rift valley, and Masai Mara. Ecuador includes the Amazon rainforest, Andean cloud forests, volcanic mountains, highlands, towns, cities, and the Galapagos Islands.

Prerequisites: Laboratory Science (D) course and Mathematics (M) course. Offered: January. Special Notes: This course carries cross-credit in biology and general studies.

ENS 330 • Ecology 3 Credits

Structure and function of wild nature. Topics include: interrelationships of organisms with their environments, factors that regulate such interrelationships, and various roles that humans play in modifying patterns and processes of nature at organism, community, and ecosystem levels.

Prerequisites: BIO 218 (may be taken concurrently). Corequisites: Concurrent registration in ENS 331 is required. Offered: Fall, odd # years. Special Notes: This is a designated research course. This course carries cross credit in biology.

ENS 331 • Ecology Lab 1 Credit

Laboratory experience accompanying BIO 330.

Corequisites: Concurrent registration in ENS 330. Offered: Fall, odd # years. Special Notes: This course carries cross credit in biology.

ENS 335K • Environmental Ethics 4 Credits

Examines the intersection of science, society, and technology as it pertains to issues in environmental ethics. Moves from theory to application by concluding with a major research project on an applied issue in environmental ethics involving scientific data and technological choice.

Prerequisites: Laboratory Science (D) course and Mathematics (M) course. Offered: Fall, January. Special Notes: This course carries cross-credit in philosophy.

ENS 399 • Introduction to Research 2 Credits

An introduction to research methodology in the environmental sciences, with experience in the use of environmental literature and an examination of how to distinguish and evaluate different types of scientific writing and presentations. Experience in the development of a research proposal.

Prerequisites: BIO 218 and Major in one of the following: biology or biochemistry/molecular biology or environmental studies; junior standing. Offered: Fall, Spring. Special Notes: This course carries cross-credit in biology.

ENS 481 • Internship in Environmental Science 3-4 Credits

Off-campus field experience working with an environmental organization, business, or governmental agency.

Prerequisites: Major in environmental science. Offered: Fall, Spring, Summer.

ENS 496 • Research in Environmental Science 1 Credit

An opportunity to become involved in an independent research project of the student's choosing in some area of environmental studies. Experience in the collection, manipulation, analysis, and portrayal of information and development of skills needed to be effective in environmental research.

Prerequisites: ENS 399; Completion or co-completion of a tagged research course; Consent of instructor.

Offered: Fall, Spring, Summer. *Special Notes:* This course carries cross credit in biology.

ENS 497 • Advanced Research in Environmental Science 1 Credit

Working under the supervision of a faculty mentor, students analyze the results of their original research completed in ENS 496 and write up their findings in a formal scientific paper. Results are presented in class and sometimes outside venues.

Prerequisites: ENS 496 and Consent of instructor. *Offered:* Fall, Spring, Summer.

ENS 499 • Symposium 0 Credit

The presentation of scientific research or internship experience. Culminates in a departmental symposium in which students present their original research or internship experience.

Prerequisites: ENS 497 or ENS 481. *Offered:* Fall, Spring. *Special Notes:* This course carries cross credit in biology.

Au Sable Institute of Environmental Studies

Several courses in the environmental area are available during the summer term through the Au Sable Institute of Environmental Studies (<http://www.ausable.org/>). Many Au Sable courses may be used to fulfill the environmental requirement in the biology major or environmental area electives in the environmental science major. See the Au Sable advisor in the Department of Biological Sciences (<https://www.bethel.edu/undergrad/academics/biology/>) for additional course offerings and further details.