

ENVIRONMENTAL SCIENCES

Students in the environmental science program use scientific approaches to address environmental problems. When they complete the program, they earn an environmental science minor.

ABOUT THE PROGRAM

The environmental science minor is open to all students regardless of their major, but it is best suited for those who have a strong interest in science or engineering. Students should complete a semester of chemistry before taking courses in environmental science. Chemistry may be taken concurrently with permission of the instructor. The environmental science minor is administered through the Department of Geological and Environmental Sciences.

Our ability to modify our environment has increased dramatically over the last century, and we now recognize that many of those modifications have negative consequences. A growing number of scientists seek solutions to environmental problems as they work to improve our understanding of the causes, processes and consequences of environmental change. The "typical" environmental scientist is a specialist in one of the traditional disciplines such as biology, chemistry, geology, physics or engineering. However, he or she generally has a broad scientific understanding of environmental systems that goes beyond the confines of his or her discipline, including an understanding of how environmental issues affect and are affected by politics and economics. An environmental scientist will often work in a team with professionals from other fields to study and solve environmental problems.

MINORS

The environmental science minor helps students acquire the background they need to be successful environmental scientists or, for those not majoring in science, to use skills learned in their own major to work closely with environmental scientists.

Environmental Sciences

The environmental science minor has the following goals for its students:

Goal #1: A solid preparation in one of the academic majors at Hope College.

Goal #2: An understanding of the perspective this discipline brings to environmental science. To meet this goal, students are required to take two courses that have been flagged as relevant to environmental science.

It is anticipated that in most cases these flagged courses will be within the student's major and will fulfill part of the requirements for this major. Flagged courses for selected majors include:

- BIOL 301 – Microbiology
- BIOL 315 – Ecology
- BIOL 343 – Plant Systematics
- BIOL 356 – Genetics
- BIOL 422 – Invertebrate Zoology
- BUS 341 – Business Law
- CHEM 331/332 – Analytical Chemistry and Laboratory
- Chemistry: Environmental Geochemistry or a second chemistry course chosen in consultation with the Chemistry Department chairperson
- ECON 212 – Microeconomics
- ENGS 140 – Introduction to Electric Circuits
- ENGS 150 – Conservation Principles
- ENGS 346 – Fluid Mechanics
- GES 225 – Geographic Information Systems
- GES 430 – Environmental Geochemistry
- GES 450 – Hydrogeology
- MATH 361/363 – Introduction to Probability and Lab
- MATH 362/364 – Mathematical Statistics and Lab
- PHYS 270 – Modern Physics
- PHYS 382 – Advanced Laboratory: students must take a semester which involves radiation
- Political Science – Two courses chosen in consultation with the Political Science Department chairperson

Goal #3: A broad interdisciplinary understanding of environmental science. Students are required to take two interdisciplinary courses in environmental science, consisting of GES 211 – Earth Environmental Systems I (Fall Semester, 3 credits), and GES 212 – Earth Environmental Systems II (Spring Semester, 3 credits). These may be taken in any order.

Goal #4: Knowledge of how environmental issues affect and are affected by politics and economics. Students meet this goal by taking GES 310 – Environmental Public Policy, 4 credits. This is an interdisciplinary course taught by faculty in the Natural Science Division, Political Science Department and/or Department of Economics.

Goal #5: An ability to work in a team with scientists and non-science professionals from other disciplines. To obtain experience with technical aspects of environmental science, students take GES 220 – Laboratory Methods in Environmental Science, 2 credits. Students are also required to take GES 401 – Advanced Environmental Seminar, 2 credits. In this capstone course they work with students and faculty from a number of disciplines to study a local environmental problem.

Goal #6: An ability to use principles of sustainability when considering environmental problems and solutions. This is introduced formally in GES 212 and incorporated throughout the minor's other course offerings.

In summary, the environmental science minor consists of:

1. Two flagged courses which may also satisfy requirements for the student's major
2. GES 211 – Earth Environmental Systems I
3. GES 212 – Earth Environmental Systems II
4. GES 220 – Laboratory Methods in Environmental Science
5. GES 310 – Environmental Public Policy
6. GES 401 – Advanced Environmental Seminar

Environmental Science Courses

The environmental science minor is administered through the Department of Geological and Environmental Sciences. Descriptions of each of the GES courses listed above are found under the heading of Environmental Science Courses in the [Geology](#) section of the catalog.

FACULTY & STAFF

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