

Environmental Science

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Environmental Science is the study of the interactions among the physical, chemical, and biological components of the environment. The Environmental Science Program at Hanover College provides a firm foundation in the natural sciences, exploration of career pathways in environmental science, and active participation in environmental science.

Interested students are advised to begin their program in the Winter Term of their first year or sophomore year by taking a $\frac{1}{4}$ credit Environmental Science Seminar (Env 201). This seminar will introduce students to the field of Environmental Science and opportunities at Hanover College. A one credit foundation course, Env 265 (Global Environmental Change) is also required. The Environmental Science Program asks that students acquire a strong foundation in a natural science discipline; therefore Environmental Science students must choose a focal science: Biology, Geology, Geochemistry, or Geophysics and, in consultation with their Environmental Science advisor, plan a curriculum that supports their interest in Environmental Science through their major courses, LADR choices, and electives. They will take Env 401 in Winter Term of their senior year and present the results of their environmental research or internship experience (Env 471 or Env 457).

Due to the significant overlap of courses, students cannot double major in Biology, Geology, Chemistry or Physics and a correlated Environmental Science track (e.g., a student cannot double major in Chemistry and the Env Geochemistry track or in Geology and the Env Geochemistry track). A student can double major in Biology, Geology, Chemistry, or Physics and an Environmental Science track that does not have significant overlap (e.g., a student could double major in Chemistry and the Env Environmental Biology track). Students cannot major in more than one track in the Environmental Biology major.

Major: Env 201 (must be taken in the freshman or sophomore year), Env 265, Env 401 (must be taken in the senior year), and Env 471 or Env 457 (culminating experience), are core courses required of all Environmental Science majors. In addition, students must elect one of four tracks: Environmental Biology, Environmental Geology, Geochemistry, or Geophysics. Courses have been chosen for each track because of their relevance to the field of Environmental Science. Cognates for each track require the student to take coursework in at least two other natural science disciplines.

Minor: Env 201 (must first be taken in the freshman or sophomore year), Env 265, Env 401, Environmental Science Seminar (must be taken in the senior year). In consultation with an environmental Science Minor faculty member, take at least four other courses in the natural sciences; no more than two 16X courses from the natural science disciplines may be counted toward the minor. Students interested in the Environmental Science Minor who are majoring in a natural science discipline must focus coursework for the minor in natural science disciplines other than the major discipline. Total of 5.5 courses.

Environmental Biology Track: Bio 161, 185, 221, 231, 301 (0.25 credits); and four others from the following list, two of which must be at the 300 level: Bio 214, 226, 234, 312, 313, 314, 315, 317, 318, 333. No more than 1 credit of any combination of Bio 308, 309, and 380 can count toward graduation.

Cognate courses: Chemistry 161 or equivalent and one of Geo 16X, Geo 221, or Geo 241.

Comprehensive evaluation (499) with a grade of C- or better. Total of 8.25 Biology courses, 2.5 Environmental Science courses, plus 2 cognates = 12.75.

Environmental Geology Track: One of a Geo 16X course; 361 (0.25 credits); six others from the following list, at least two of which must be at the 300 or 400 level: Geo 220, 221, 233, 237, 241, 261, 327, 328, 334, 357, and 465. Students must complete at least one field course (Geo162, 233, or 237).

Cognate courses: Chemistry 161 and Bio 161 or equivalent courses.

Comprehensive evaluation (499) with a grade of C- or better. Total of 7.25 Geology courses, 2.5 Environmental Science courses, plus 2 cognates = 11.75.

Geochemistry Track: Che 161, 185, 221, 222, 325, and one additional course from either Che 311, 324, 341, or 351; a Geo16X course, 220, and 361 (0.25 credit); and two additional courses from the following list, at least one of which must be 300 level: Geo 233, 237, 322, 327, 328, or 334. Students must complete at least one Geology field course (Geo162, 233, or 237).

Comprehensive evaluation (499) with a grade of C- or better. Total of 6.0 Chemistry courses, 4.25 Geology courses, and 2.5 Environmental Science courses = 12.75.

Geophysics Track: Phy 161, 185, 320, 331; one of Ast166, Phy 332, Phy 341; a Geo16X course, 323, and 361(0.25 credit); and two additional courses from the following list, at least one of which must be 300 level Geo 233, 237, 241, 261, 328, or 334. Students must complete at least one Geology field course (Geo162, 233, or 237).

Cognate courses: Math 121 or Math 111/112

Comprehensive evaluation (499) with a grade of C- or better. Total of 5 Physics courses, 4.25 Geology courses, and 2.5 Environmental Science courses, plus 1 cognate = 12.75.

Recommended:

Environmental Science faculty recommend that students take either Math 217, Math 121 or Math 111/112 as their Abstract and Formal Reasoning LADR requirement.

Environmental Science faculty encourage students to explore additional perspectives on the environment from the social sciences and the humanities. We recommend that ENV majors take one or more of the following courses as their scheduling permits. It should be noted that some of these courses have prerequisites:

Anth 222, 232, 329; 221; Cs 110; His 268; Mat 217; Phi 164, 320, 337s; Pls 225, 321; Soc 229; and Ths 164.

Env 201. Environmental Science Seminar. An interdisciplinary seminar that will introduce students to the environmental sciences. Must first be taken by students in the freshman or sophomore year. May also be taken by students not enrolled in the Environmental Science Minor or Major. Pass/Fail only. 0.25 unit. Offered Winter Term only.

Env 260. Special Topics.

Env 265. Global Environmental Change. Introduction to the influence of human civilization on Earth's environmental systems: describes the natural components of these systems and their interactions, places humans within these systems, details the affects of human activity, and suggests alternative human practices that lessen the severity of their impacts. Laboratories emphasize practical, project-based experience.

Env 307. Directed Study. .50 unit.

Env 360. Special Topics.

Env 370. Directed Study.

Env 401. Environmental Science Seminar. An interdisciplinary seminar that will serve as the culminating experience for seniors as they complete the Environmental Science Minor or Major. Students will make a presentation of their work related to the Environmental Science Minor. Must be taken in the senior year. Pass/Fail only. 0.25 unit. Offered Winter Term only.

Env 457. Internship. Off-campus supervised experience in environmental science; must involve active participation in environmental research or related activities. Permission of advisor.

Env 465. Capstone Seminar. Course content will reflect the topic for the annual Capstone. Open to all juniors and seniors and may be repeated once for credit. Students may enroll in only one Capstone seminar in a given term.

Env 471. Senior thesis. Individual investigation of a topic of special relevance to student's interest in environmental science; may take the form of a laboratory or field research investigation, library research, or internship resulting in written and oral reports. Prerequisite: Senior standing and consent of the directing professor.

Env 499. Comprehensive Evaluation.

Courses in the Environmental Biology, Environmental Geology, Geochemistry, and Geophysics tracks are described under the Biology, Chemistry, Geology, and Physics departmental listings of the catalog.