

ENVIRONMENT AND SUSTAINABILITY

Department website: envsci.barnard.edu

Department location: tbd

Department contact: 212-854-5618

Chair: Brian Mailloux

Department Manager: Tiffany Nesbitt

Department Assistant: Catherine Cook

The Department of Environmental Science Mission

Barnard College's Environmental Science Department provides highly motivated young women with challenging and rewarding programs in Environmental Science, Environmental Biology, and Environment and Sustainability. High academic standards, multidisciplinary courses, and training in methodologies such as field work, measurements, and data analysis, ready our students with the tools needed to think critically, evaluate and solve problems, and understand and communicate science to address the needs of society. Faculty members are nationally and internationally recognized scholars and educators, active in research and curriculum development. Courses are innovative, featuring multimedia and technologically advanced resources. The urban setting, the proximity to the Hudson River, and the numerous affiliations we maintain with Columbia University through Lamont-Doherty Earth Observatory, the Climate School, and the School of Public Health, as well as Black Rock Forest, the American Museum of Natural History and other institutions, allow us to offer undergraduates unparalleled opportunities for student research and educational experiences. Upon successful completion of our program, our students are well prepared to continue their academic studies as graduate students or to pursue successful careers in a wide range of fields. Only the major is offered; no minor is available.

Program of Study

The department offers a major in Environment and Sustainability.

Program-level Student Learning Outcomes

We expect that students graduating with an Environment and Sustainability major will learn to:

- Evaluate the history, structure, function, interactions, and trends of key environmental systems: climate, earth, life, socio-political
- Assemble a logical chain of reasoning using the scientific method, ranging from observation to inference, in order to identify and characterize a problem and find solutions
- Apply appropriate analytical, quantitative, and qualitative approaches to handle uncertain, complex, real-world problems in the lab, field, and society
- Collaborate in teams, with peers and mentors, and work with others in diverse group settings, developing flexibility and leadership skills.
- Communicate complex analyses, interpretations, and significance through various media to audiences ranging from scientific to policy, and the general public

Environment and Sustainability provides a scientific basis for management of earth systems. It focuses on the interaction between human activities, resources, and the environment. As human population grows and technology advances, pressures on earth's natural systems are becoming increasingly intense and complex. Environment and Sustainability is an exciting field where science is used to best serve society. The department offers the major and minor in Environmental Science, and a major in but no minor in Environment and Sustainability. A third major, Environmental Biology, is offered in conjunction with the Department of Biological Sciences.

The curriculum recognizes the need for well-trained scientists to cope with balancing human requirements and environmental conservation. Majors acquire an understanding of earth systems by taking courses in the natural sciences, as well as courses investigating environmental stress. Students learn to critically evaluate the diverse information necessary for sound environmental analysis. Our courses foster an interdisciplinary approach to environmental problem-solving.

Internships or some type of work or field experience are extremely valuable in preparing students for a career in Environmental Science. We strongly encourage students to consider an internship in the summer before the senior year because it may lay the foundation for the senior thesis. Studies have shown that students who have had related work experience are more attractive to employers and graduate schools.

Students interested in environmental science might want to consider a semester or summer program at the [SEE-U, SEA Semester at Woods Hole](#), the [School for Field Studies](#), the [Organization for Tropical Studies](#), or some other field program. In addition, we recommend that those students planning to go abroad in the junior year elect to do so in the Fall Semester rather than the Spring Semester in order to take best advantage of senior seminar research planning and programming.

Students wishing to go on to graduate school or careers in earth science and the physical sciences should take at least two semesters each of calculus, physics, and chemistry. Those considering graduate school or careers in biological/chemical fields are recommended to take calculus as well as upper-level courses in biology and chemistry, and may wish to consider enrolling in an Environmental Biology major or minors in these fields. Students interested in pursuing further work in environmental policy, economics, environmental law, journalism, or teaching may consider pursuing a double major or a special major.

Professor: Brian Mailloux (Alena Wels Hirschorn '58 and Martin Hirschorn Professor in Environmental & Applied Science and Ann Whitney Olin Professor of Environmental Science), Martin Stute (Emeritus)

Associate Professor: Elizabeth Cook

Assistant Professors: Logan Brenner, Zoie Diana, Mike He

Senior Lecturers: Terryanne Maenza-Gmelch (Laboratory Director), Sedelia Rodriguez (Laboratory Director and Minor Advisor)

Adjunct Professor: Dana Neacșu (Spring)

Adjunct Assistant Professor: Rebecca Gustine (full year)

Specific course requirements for the major in Environment and Sustainability can be found on the Requirements tab under Environmental Science.

Environment and Sustainability Major

Sustainability is a growing field focusing on finding solutions in an ever-changing environment. Majors develop an understanding of the processes and stresses of earth's systems, handle environmental data and make reasoned assessments, and engage in collaborative and

interdisciplinary work required for developing approaches to maintain a sustainable environment.

The Environment and Sustainability major is designed to equip students to play effective roles as citizens or career professionals who can actively engage in environmental decision-making and policy in a rapidly changing environment. Majors learn to analyze and evaluate environmental, political, and economic systems and public policies in the context of environmental concerns, and to use these interdisciplinary skills to navigate development with the environment in mind. The major begins with foundations in the natural sciences, social sciences, and quantitative analysis, followed by upper level electives in both the natural and social sciences, as is a required hands-on, client-based collaborative workshop at the junior level is required. Many exciting opportunities for student research exist on this campus and in the greater metropolitan community.

Environment and Sustainability as did Policy graduates will go on to a variety of careers, including national and international environmental policy, law, economics, journalism, business, public administration, government agencies, corporations, multilateral institutions, nongovernmental organizations, academia, and consulting firms. There is no minor in Environment and Sustainability.

Requirements for the Environment and Sustainability Major

For requirement details, see Environment and Sustainability Major Requirement Worksheet, [envsustworksheet.doc](#) on the [Environment and Sustainability page](#).

Advice for the Environment and Sustainability Major

Advisers: Co-Chair, Martin Stute

Because this Major was approved by the Faculty in Fall 2017 as a updated replacement for the Environmental Policy, any student may elect the Environment and Sustainability major, but only students in the Class of 2019 or 2018 can graduate with a major in Environmental Policy because it is being phased out.

Students with a strong science background who are interested in majoring in Environment and Sustainability are advised to take Earth's Environmental Systems: Climate (EESC UN2100 EARTH'S ENVIRO SYST: CLIM SYST).

If you are interested in exploring Environment and Sustainability or are concerned about your science background, you could take EESC BC1001 Environmental Science I in the fall. In the spring, you would need to find another introductory level Environmental Science course such as EESC UN1011, Earth, Origin, Evolution, Processes, Future (with Lab) or shift into the major sequence of EESC UN2100 EARTH'S ENVIRO SYST: CLIM SYST which is a Natural Science Foundation course. Please also note the following:

For the second Natural Science Foundation course requirement can be fulfilled by Majors in Environment and Sustainability with either CHEM BC2001, General Chemistry or EESC BC3016x, Environmental Measurements along with either another Additional Science Foundations Course or a Quantitative Foundations Analysis/Skills course. There are a few options to fulfill the 3rd Natural Foundation course requirements, so see above or the Environment and Sustainability Major Requirement Worksheet, [envsustworksheet.doc](#) for more specifics.

We recommend that Environment and Sustainability majors take CHEM BC2001 GENERAL CHEMISTRY I and BIOL BC1500 INTRO ORGANISMAL/EVOL BIOL plus the corresponding

lab, BIOL BC1501 INTRO LAB/ORGANISMAL#EVOL BIO, early in their academic career at Barnard in order to prepare for upper level courses with prerequisites, but it is not recommended that they be taken concurrently. Students with concerns about their science preparation should realize the option of taking EESC BC2016, Environmental Measurements (plus the additional course). If you want advice on taking an Introductory Biology course, visit [Biology](#), and for advice on taking an Introductory Physics course, visit [Physics](#).

Students should check the catalogue and the department for additional information on the major, minor and courses offered by Barnard and Columbia. Classes with grades less than C- or taken pass/fail can not be counted towards the major. The minimum number of course points for the Environment and Sustainability Major is 47.5 points.

See also Senior Research Seminar for information on senior thesis requirements.

Advisers: Martin Stute (Environmental Science Department), Kimberly Marten (Political Science), Alan Dye (Economics), Paige West (Anthropology), David Weiman (Urban Studies).

Students with a strong science background who are interested in majoring in Environmental Policy are advised to take Earth's Environmental Systems: Climate (EESC UN2100 EARTH'S ENVIRO SYST: CLIM SYST).

If you are interested in exploring Environmental Policy or are concerned about your science background, you could take EESC BC1001 Environmental Science I in the fall. In the spring, you would need to find another introductory level Environmental Science course such as EESC UN1011 Earth, Origin, Evolution, Processes, Future (with Lab) or shift into the major sequence of EESC V2100 Earth's Environmental Systems: Climate which is a Natural Science Foundation course. Please also note the following:

EESC BC1001 Environmental Science I must be taken prior to taking EESC UN2100, UN2200 or UN2300.

We recommend that Environmental Policy majors take CHEM BC2001 GENERAL CHEMISTRY I and BIOL BC1500INTRO ORGANISMAL/EVOL BIOL plus the corresponding lab, BIOL BC1501 INTRO LAB/ORGANISMAL#EVOL BIO, early in their academic career at Barnard in order to prepare for upper level courses with prerequisites. Students with concerns about their science preparation should not take both at the same time. If you want advice on taking an Introductory Biology course, visit [Biology](#), and for advice on taking an Introductory Physics course, visit [Physics](#).

Students should check the catalogue and the department for additional information on the major, minor and courses offered by Barnard and Columbia. Classes with grades less than C- or taken pass/fail can not be counted towards the major.

See also Senior Research Seminar for information on senior thesis requirements.

Specific courses for the major in Environment and Sustainability can be found on the Courses tab under Environmental Science.