College of Arts and Sciences

Environmental Science

B.A. in Environmental Studies

Admission to the Program

Admission to the program is through formal declaration of the major through the Department of Biology.

University Requirements

- A total of 120 credit hours
- 6 credit hours of college writing
- 3 credit hours of college mathematics or the equivalent by examination

General Education Requirements

- A total of ten courses, consisting of one foundation course and one second-level course in an approved sequence from each of the five curricular areas
- No more than 6 credit hours may be taken in the same discipline

Major Requirements

- 70 credit hours with grades of C or better

Course Requirements

Core (52 credit hours)

Social Sciences (15 credit hours)

- ECON-100 Macroeconomics 4:1 (3)
- ECON-200 Microeconomics 4:2 (3)
- GOVT-110 Politics in the United States 4:1 (3)
- SIS-105 World Politics 3:1 (3)
- One of the following:
  ANTH-334 Environmental Justice (3)
  SOCY-389 Society and the Global Environment (3)

Environmental Studies (19 credit hours)

- CHEM-330 Environmental Chemistry (3)
- ENVS-102 Seminar in Environmental Issues (1)
- ENVS-360 Environment and the Atmosphere (3)
- ENVS-375 Water Resources (3)
- ENVS-492 Senior Capstone in Environmental Studies (3)
- Two from the following:
  ECON-379 Economics of Environmental Policy (3)
  GOVT-370 Formation and Implementation of Environmental Policy (3)
  GOVT-423 Advanced Studies in Public Policy (3): Conservation Politics
  SIS-337 International Development (3)
  SIS-338 Environment and Development (3)
  SIS-388 International Environmental Politics (3)

Natural Sciences and Mathematics (18-20 credit hours)

- BIO-110 General Biology I 5:1 (4)
  or
  BIO-100 Great Experiments in Biology 5:1 (4)
- BIO-210 General Biology II 5:2 (4)
  or
  ENVS-250 Living in the Environment 5:2 (3)
- CHEM-110 General Chemistry I 5:1 (4)
  or
  CHEM-100 The Molecular World 5:1 (4)
- CHEM-210 General Chemistry II 5:2 (4)
  or
  CHEM-220 Environmental Resources and Energy 5:2 (3)
- one of the following:
  MATH-211 Applied Calculus I (4) *or*
  MATH-221 Calculus I (4)

Related Course Requirements (18 credit hours)

Skills (3 credit hours)

- One of the following:
  COMM-200 Writing for Mass Communication (3)
  CSC-310 Introduction to Geographic Information Systems (3)

Environmental Applications (12 credit hours)

- 12 credit hours from the following:
  ANTH-334 Environmental Justice (3) (if not taken for core requirement)
  BIO-340 Marine Biology (3)
  BIO-342 Marine Mammals (3)
  BIO-423 Introduction to Ecology (3)
  BIO-440 Microbiology with Laboratory (4)
  BIO-562 Aquatic Field Methods (3)
  BIO-563 Terrestrial Field Methods (3)
  CHEM-310 Organic Chemistry I (3) *and*
  CHEM-312 Organic Chemistry I Laboratory (1)
  CHEM-320 Organic Chemistry II (3) *and*
  CHEM-322 Organic Chemistry II Laboratory (1)
  ECON-379 Economics of Environmental Policy (3)(if not taken for core requirement)
  ENVS-240 Oceanography 5:2 (3)
  ENVS-303 Environmental Issues in the Chesapeake Bay (6)
  ENVS-520 Biogeochemistry (3)
  ENVS-572 Topics in Conservation Biology (3)
  ENVS-580 Environmental Science I: A Quantitative Approach (3)
  ENVS-581 Environmental Science II: A Quantitative Approach (3)

ENVS-582 Environmental Law (3)
GOVT-370 Formation and Implementation of Environmental Policy (3) (if not taken for core requirement)
GOVT-423 Advanced Studies in Public Policy (3): Conservation Politics (if not taken for core requirement)
PHYS-105 College Physics I 5:1 (4)
or
PHYS-110 University Physics I 5:1 (4)
PHYS-205 College Physics II 5:2 (4)
or
PHYS-210 University Physics II 5:2 (4)
SIS-337 International Development (3) (if not taken for core requirement)
SIS-338 Environment and Development (3) (if not taken for core requirement)
SIS-388 International Environmental Politics (3) (if not taken for core requirement)
SOCY-389 Society and the Global Environment (3) (if not taken for core requirement)
STAT-202 Basic Statistics (4)

Other courses may be substituted with approval of the Environmental Studies coordinator.

Experiential Learning (3 credit hours)

A maximum of 3 credit hours from:
ENVS-392 Cooperative Education Field Experience (3)
ENVS-490 Independent Study Project (1–6)
ENVS-491 Internship (1–6)

University Honors Program

All University Honors students must complete at least 12 credit hours of advanced-level (300-level and above) Honors courses including a 3 to 6 credit hour Honors Senior Capstone Project. Students may graduate with University Honors in the major if they complete at least 12 advanced-level Honors courses including the Senior Capstone Project in the department. Each department has three levels of University Honors requirements: Level I Options (100-200-level Honors classes); Level II Options (300-level and above Honors classes); and Level III Options (Honors Senior Capstone). The department Honors coordinator advises students in the University Honors Program regarding departmental options. For more information, go to www.american.edu/academic.depts/honors/ .

Minor in Environmental Science

Requirements

- A minimum of 22 credit hours with grades of C or better with at least 12 credit hours unique to the minor

Course Requirements

- CHEM-110 General Chemistry I 5:1 (4)
- CHEM-210 General Chemistry I 5:2 (4)
- CHEM-401 Geology (3)
- ENVS-102 Environmental Issues (1)
- ENVS-360 Environment and the Atmosphere (3)
- ENVS-375 Water Resources (3)
- MATH-211 Applied Calculus I (4) *or*
  MATH-221 Calculus I (4)
- Students whose major requirements include CHEM-110, CHEM-210, and MATH-211/MATH-221 take an additional course as approved by the Environmental Studies coordinator

Combined Bachelor's Degree and M.S. in Environmental Science

This program enables qualified students to earn both an undergraduate degree (in any field) and an M.S. in Environmental Science. The combined program can be completed with four years of undergraduate study plus 12 months of additional graduate study (fall and spring semesters plus a summer of research or internship). The program offers students an opportunity for strong training and careers in environmental science or policy.

Admission to the Program

Undergraduates should apply for admission to the combined program by the end of the junior year. At a minimum, students must have an overall grade point average of 3.00 or higher, and have taken a year of laboratory science (BIO-110/210 General Biology I/II, CHEM-110/210 General Chemistry I/II, PHYS-105/205 College Physics I/II or PHYS-110/210 University Physics I/II) and a year of calculus (MATH-221/222, MATH-211/212).

Applications must be accompanied by two letters of recommendation and a statement of purpose. Graduate Record Examination (GRE) scores may be required for admission to the combined program. Students should discuss their interest in the program with the Environmental Studies coordinator before submitting an application.

Requirements

- All requirements for a B.A. or B.S. (in any major) at American University

  Undergraduate students may apply up to 9 credit hours of approved graduate-level course work to satisfy the requirements of both degrees. ENVS-580 Environmental Science I and ENVS-581 Environmental Science II are recommended.
- All requirements for the M.S. in Environmental Science, including a minimum of 18 credit hours completed in residence in graduate status after the undergraduate degree has been awarded.

M.S. in Environmental Science

Admission to the Program

In addition to meeting the minimum university requirements for graduate study, students must have completed one year of calculus and one year of laboratory science (biology, chemistry, geology, or physics). A semester or more of economics is recommended. Admission is based on academic record, personal statement, and two letters of recommendation. The Graduate Record Examination (GRE) is required.

Degree Requirements

- 36 credit hours of approved graduate work, including 6 credit hours of ENVS-681, ENVS-690, and ENVS-691 in lieu of a thesis
  Students are required to take ENVS-681 during the spring semester of their final year; they write a paper based on an internship, research, or independent study and present the paper during a venue approved by the graduate advisor.
- One comprehensive examination; a maximum of two attempts is permitted.

Course Requirements

Core (18 credit hours)

- CSC-610 Introduction to Geographic Information Systems (3)
- ENVS-580 Environmental Science I: A Quantitative Approach (3)
- ENVS-581 Environmental Science II: A Quantitative Approach (3)
- ENVS-681 Environmental Research Seminar and Practicum (3)
  and
  ENVS-690 Environmental Science Research (3)
  or
  ENVS-691 Internship (3)
- STAT-514 Statistical Methods (3)

Electives (18 credit hours)

- 18 credit hours chosen in consultation with the graduate advisor from each of the two clusters below. A statistics course (STAT-515, STAT-516, STAT-520, or STAT-524) may be substituted for one of the courses; other courses may be substituted with permission of the graduate advisor.
- 9 credit hours from the following environmental science courses:
  BIO-562 Aquatic Field Methods (3)
  BIO-563 Terrestrial Field Methods (3)
  BIO/ENVS-596 Selected Topics: Nonrecurring (approved topics)
  ENVS-520 Biogeochemistry (3)
  ENVS-572 Topics in Conservation Biology (
  ENVS-575 Environmental Risk Assessment (3)
  ENVS-675 Hydrology
- 9 credit hours from the following environmental policy/economics courses:
  ECON-579 Environmental Economics (3)
  ENVS-582 Environmental Law (3)
  PUAD-606 Foundations of Policy Analysis (3)
  SIS-620 Studies in Global Environmental Politics (3) (topics)
  SIS-649 Environment and Development (3)
  SIS-660 Environment and Politics (3)
  SOCY-689 Environmental Sociology (3)

Graduate Certificate in Environmental Assessment

Admission to the Program

Open to students with a bachelor's degree from an accredited institution. Students must have completed the following prerequisite courses: calculus, statistics, and organic chemistry.

Certificate Requirements

- 15 credit hours of approved course work with at least 6 credit hours at the 600-level or above, with grades of C or better
  Grades of C- or D in certificate program courses are not accepted toward the fulfillment of certificate requirements, although these grades will be included in the calculation of the GPA. Students must have at least a 3.0 GPA in certificate courses in order to be awarded a certificate. Students in certificate programs must take a minimum of 6 credit hours during each 12-month period and complete the certificate in four years. International students must enroll in 9 credit hours each semester (except for summer). A maximum of 3 credit hours earned at an accredited college or university may be applied toward the certificate as transfer credit.

Course Requirements

- CHEM-671 Principles of Toxicology (3)
- CSC-610 Introduction to Geographic Information Systems (3)
- ITEC-688 Introduction to Decision Analysis (3)
- ENVS-575 Environmental Risk Assessment (3)
- ENVS-681 Environmental Research Seminar and Practicum (3)