Environmental Studies (ENS)
Interdisciplinary Major and Undergraduate College Academy Minor in Environmental Studies

School of Marine and Atmospheric Sciences (SoMAS)

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Environmental Studies (ENS)
The Environmental Studies major, leading to a Bachelor of Arts degree, is designed to provide students with the analytical and communication skills and the broad background necessary to understand and address complex environmental issues. The major also offers the opportunity for students to carry out focused study within a specific area of interest. Environmental issues are not resolved in the scientific, technological, social, or political arenas alone. The curriculum is, therefore, interdisciplinary and integrates principles and methodologies from the social sciences, engineering, the natural sciences, and humanities. The goal is to address the complex scientific, legal, political, socioeconomic and ethical issues that define and surround environmental issues.

The major in Environmental Studies prepares the student for further education and entry-level employment in areas such as public interest science and advocacy, environmental conservation, law, journalism, management, television documentary production, ecotourism, population studies, and public service including public health.

To demonstrate depth of learning, an area of concentration is required of all students in the major. Additionally, a research course, an internship, or field study is an essential part of the curriculum to provide real-world experience in an appropriate subject area.

The Environmental Studies major is administered by the School of Marine and Atmospheric Sciences. A Living Learning Center and a minor, with a residential component, are also available. The Environmental Studies Academy, which is part of the Science and Society College, offers special programs, such as a seminar series showcasing faculty research and selected courses in the major and minor. Students may not pursue the minor in conjunction with the major.

Students should contact the director of undergraduate studies to design and approve an acceptable course of study before declaring the major. Students may learn more about the School of Marine and Atmospheric Sciences by visiting http://www.somas.stonybrook.edu.

Requirements for the Major and Minor in Environmental Studies (ENS)

Environmental Studies (BA)
The Bachelor of Arts in Environmental Studies major is designed to provide students with the analytical and communication skills and the broad background necessary to understand and address complex environmental issues. Environmental issues are not resolved in the scientific, technological, social, or political arenas alone. The curriculum is, therefore, interdisciplinary and integrates principles and methodologies from the social sciences, the natural sciences, and humanities. The goal is to address the complex scientific, legal, political, socioeconomic and ethical issues that define and surround environmental issues. The Bachelor of Arts in Environmental Studies prepares the student for further education and for entry-level employment in areas such as public interest science and advocacy, environmental conservation, law, journalism, management, television documentary production, ecotourism, population studies, and public service including public health.

To demonstrate depth of learning, an area of concentration is required of all students in the major. Additionally, a research course, an internship, or field study is an essential part of the curriculum to provide real-world experience in an appropriate subject area.

The Environmental Studies major (BA) is administered by the School of Marine and Atmospheric Sciences. An Environmental Studies Academy and a minor, with a residential component, are also available. The Environmental Studies Academy, which is part of the Science and Society College, offers special programs, such as a seminar series showcasing faculty research and selected courses in the major and minor. Students may not pursue the ENS or COS minor in conjunction with the major.

Completion of the major requires approximately 62 credits. Of these, no more than one course (4 credits) with a grade lower than C can be credited to the major.

Requirements for the Major in Environmental Studies
Completion of the major requires approximately 62 credits.

A. Foundation Courses

- AMS 102 Statistics or equivalent (see Note 5)
- ANP 120 Introduction to Biological Anthropology
- BIO 201 Fundamentals of Biology: Organisms to Ecosystems
- BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I
- CHE 131, CHE 133 General Chemistry and Lab (See Note 4)
- ECO 108 Introduction to Economics
- ENS 119 Physics for Environmental Studies or equivalent (see Note 1)
• MAT 125 or MAT 131 or MAT 141 or MAT 171 Calculus. If students do not place into MAT 125 or 131 or 141 or MAT 171 on the basis of the math placement examination, MAT 123 is a required course for the major.
• PHI 104 Moral Reasoning
• POL 102 Introduction to American Government

One of the following:

• GEO 101 Environmental Geology or MAR 104 Oceanography or ATM 102 Weather and Climate or ENS 101 Prospects for Planet Earth

B. Core Courses (17 credits)

• ATM 305 Global Atmospheric Change
• CSK 302 Technical Writing and Communication
• ENS 311 Ecosystem Ecology and Global Environment
• One of the following: MAR 340 Environmental Problems and Solutions OR ENS 312 Population, Technology, and Environment
• One of the following: ENS 301 Contemporary Environmental Issues and Policies OR CSK 305 Collective Action and Advocacy
• At least two credits from one of the following courses: ENS 443 Environmental Problem Solving, ENS 487 Independent Research, or ENS 488 Internship

C. Concentration (12 credits)

Students should select four upper division courses in a thematic area in consultation with the undergraduate director. Some sample concentrations are listed below, but other possibilities may be approved if discussed in advance with the departmental advisor. For all concentrations, appropriate substitutions will be permitted with approval of the undergraduate director.

1. Conservation Biology/Physical Anthropology

Four courses from the following:

• ANP 321 Primate Evolution
• ANP 350 Methods in Studying Primates
• ANP 360 Primate Conservation
• MAR 315 Marine Conservation
• BIO 336 Conservation Biology
• BIO 351 Ecology
• BIO 356 Applied Ecology and Conservation and Biology Lab

2. Marine Science, Marine or Terrestrial Ecology

Four courses from the following:

Ecology themed:

• BIO 351 Ecology
• BIO 352 Ecology Lab*
• BIO 353 Marine Ecology
• One of the following:
  • BIO 354 Evolution*
  • BIO 385 Plant Ecology
  • BIO 359 Behavioral Ecology*
  • MAR 301 Environ. Microbio.*
  • MAR 302 Marine Microbio. and Microbial Ecology*
  • MAR 305 Experimental Marine Bio.
  • MAR 315 Marine Conservation
  • MAR 320 Limnology
  • MAR 349 Intro. to Bio. Oceanogr.*
  • MAR 366 Plankton Ecology*
  • MAR 370 Marine Mammals*
  • MAR 375 Marine Mammal and Turtle Rehab.
  • MAR 380 Ichthyology
  • MAR 385 Princ. of Fishery Bio. and Management
  • MAR 386 Ecosystem Science for Fisheries Management
  • MAR 388 Tropical Marine Ecology

Marine Science themed:

• MAR 303 Long Island Marine Habitats
• MAR 304 Waves, Tides, and Beaches
• MAR 333 Coastal Oceanography

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• MAR 334 Remote Sensing
• MAR 336 Marine Pollution
• MAR 346 Marine Sedimentology
• MAR 351 Intro. to Ocean Chem.*
• MAR 352 Intro. to Physical Oceanoogr.*

3. Environmental Law, Waste Management, and Public Policy
Four courses from the following:

• EHM 325 Environmental Film, Media, Arts
• ENS/POL 333 Environ. Law
• GEO 313 Understanding Water Resources
• HIS 302 Environ. History in Global Perspective
• AAS/HIS 352 Environ. History of China
• HIS 351 Environ. History of N. America*
• MAR 392 Waste Management Issues
• MAR/BCP 394 Environ. Toxicology and Public Health

*These courses have additional prerequisites outside the major

D. Communications
Proficiency in writing, oral communication, and computer literacy will be encouraged in all students. These skills will be developed within the context of formal coursework and no additional credits are required.

E. Upper-Division Writing Requirement
The advanced writing component of the major in ENS requires registration in the 0-credit MAR 459 and approval of either a term paper or a laboratory report written for an advanced course in the ENS major at Stony Brook (including Readings and Research courses). ENS 311/BIO 386 or ENS 443 are preapproved for use with MAR 459 (or BIO 459 for BIO 386). For students in the Ecology or marine science track of the ENS major, successful completion of MAR 459 or BIO 459 in association with a marine science or ecology course will also be accepted. Students who wish to use material from a participating course should obtain the necessary form and present it to the course director prior to submission of the material. For MAR 459 the course director will grade the material and assign a grade for the appropriate section of MAR 459. For BIO 459 instructions from the biology department should be followed. For students in other concentrations, consult with the undergraduate director about the appropriate approach to fulfilling the WRTD requirement.

Completion of MAR 459 with a grade of S will result in approval of the WRTD requirement. Students should consult with the department advisor to ensure that their plan for completing the Upper Division Writing Requirement is consistent with university graduation requirements for General Education. Students completing the Stony Brook Curriculum (SBC) must complete a course that satisfies the "Write Effectively within One's Discipline" (WRTD) learning objective to graduate. The Upper Division Writing Requirement is consistent in most cases with the SBC learning outcomes for WRTD.

Notes:
1. PHY 121/PHY 123, PHY 122/PHY 124 or PHY 125, PHY 126, PHY 127 or PHY 131/PHY 133, PHY 132/PHY 134 or PHY 141, PHY 142 may be substituted for PHY 119/ENS 119.
2. Two credits of any course numbered 487 or equivalent with one of the following designators: ANP, ANT, ATM, BCP, BIO, CHE, ECO, ENS, EST, GEO, MAR, PHY, POL. In addition to other prerequisites, credit toward the major requires approval of the research topic by the Director of Undergraduate Studies of the Marine Sciences Research Center.
3. Two credits of any course numbered 488 or equivalent with one of the following designators: ANP, ANT, ATM, BCP, BIO, CHE, ECO, ENS, EST, GEO, MAR, PHY, POL. In addition to other prerequisites, credit toward the major requires approval of the internship by the Director of Undergraduate Studies.
4. CHE 129/130 may be substituted for CHE 131.
5. AMS 110, AMS 310, ECO 320, POL 201, PSY 201, or SOC 202 may be substituted for AMS 102.

Honors Program in Environmental Studies
Graduation with departmental honors in Environmental Studies requires the following:

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1. Students are eligible to participate in the Honors Program if they have a 3.50 GPA in all courses for the major by the end of the junior year. Students should apply to the SoMAS undergraduate director for permission to participate.

2. Students must prepare an honors thesis based on a research project written in the form of a paper for a scientific journal. A student interested in becoming a candidate for honors should submit an outline of the proposed thesis research project to the SoMAS undergraduate director as early as possible, but no later than the second week of classes in the last semester. The student will be given an oral examination in May on his or her research by his or her research supervisor and the undergraduate research committee. The awarding of honors requires the recommendation of this committee and recognizes superior performance in research and scholarly endeavors. The written thesis must be submitted before the end of the semester in which the student is graduating.

3. If the student maintains a GPA of 3.5 in all courses in their major through senior year and receives a recommendation by the undergraduate research committee, he or she will receive departmental honors.

**Study Abroad**

Stony Brook University offers study abroad experiences that are focused on issues of sustainability in Costa Rica, Madagascar, and the Turkana Basin (Kenya). While issues of climate change, water and energy security, sustainable agriculture, environmental justice, sustainable economic development, conservation of unique and threatened ecosystems, population growth, and human health are important everywhere, viewing these issues through the lens of a different place and a different culture provides a valuable perspective. Students are encouraged to participate in study abroad experiences and to talk with their major director to determine how study abroad coursework can be used to fulfill some requirements for their major.

**Undergraduate College Academy Minor in Environmental Studies**

The Environmental Studies Undergraduate College Academy, housed in the Science and Society College, offers a minor in Environmental Studies as well as activities that emphasize both scientific and social issues encompassed by the broad field of environmental studies. Through this program, motivated natural science and social science students are able to apply their other coursework specifically to the study of the environment. In addition, participation in the program adds a rewarding academic component to each student's residential experience. The minor in Environmental Studies provides enhanced exposure to one subfield of environmental studies, the natural science of the environment.

**Requirements for the Minor**

All core courses must be taken at Stony Brook University. No more than two courses applied to the minor can count toward the student’s major or other minor. No more than one elective course in the minor may be taken under the Pass/No Credit option; all other courses required for the minor must be passed with a letter grade of C or higher. (Note: The P/NC option carries financial implications. All students should check with their financial aid advisor before choosing this option.)

**Declaration of the Minor**

Each ENS minor is open to all undergraduate students and takes approximately 4 semesters (fall/spring) to complete and students are encouraged to declare before the start of their sophomore year but no later than the first semester of their junior year depending on target date of graduation. Students should consult with the Faculty Director as soon as possible and plan their course of study for fulfillment of their degree requirements. Completion of the minor requires 18 credits.

1. One introductory course chosen from the following:

   - ATM 102/EST 102 Weather and Climate
   - BIO 113 General Ecology
   - BIO 201 Principles of Biology: From Organisms to Ecosystems
   - GEO 101 Environmental Geology
   - GSS 105 Introduction to Maps and Mapping
   - MAR 101 Long Island Sound: Science and Use
   - MAR 104 Oceanography
   - SBC 111 Introduction to Sustainability Studies

2. ENS 101 Prospects for Planet Earth

3. ENS 301 Contemporary Environmental Issues and Policies

4. ENS 443 Environmental Problem-Solving OR at least 3 credits of (i) ENS 487: Independent Research in Environmental Studies; or (ii) research in any SBU department; or (iii) ENS 488: Internship in Environmental Studies, approved by the faculty director.

5. Two advanced courses chosen from the following:

   - ANP 360 Primate Conservation
   - ANT 420 Environmental Analysis Using Remote Sensing and Geographic Information Systems
   - ATM 397 Air Pollution and Its Control
   - BIO 351 Ecology
   - BIO/GEO 353 Marine Ecology
   - BIO 353/GEO 353 Marine Ecology
   - CHE 310 Chemistry in Technology and the Environment
   - EHM 315 Ethnographic Field Methods
   - EHM 320 Artists and Designers of the Environment and Ecosystems
   - GEO 304 Energy, Mineral Resources, and the Environment
   - GEO 315 Groundwater Hydrology
Sample Course Sequence for the Major in Environmental Studies, BA
A course planning guide for this major may be found here. The major course planning guides are not part of the official Undergraduate Bulletin, and are only updated periodically for use as an advising tool. The Undergraduate Bulletin supersedes any errors or omissions in the major course planning guides.

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ENS
Environmental Studies

ENS 101: Prospects for Planet Earth
An introduction for non-science majors to global environmental change. Exploration of the natural science of Earth’s environment; the scientific, socioeconomic, and political issues that influence human impact on the global environment and responses to environmental changes; the strategies for humans to live in greater harmony with planet Earth. Global issues are related to the particular issues of the United States, the Northeast, and the greater metropolitan New York City-Long Island area.

DEC: E
SBC: SNW
3 credits

ENS 119: Physics for Environmental Studies
The principles of physics as they apply to environmental issues. A review of mathematics is followed by a discussion of Newton’s laws, conservation principles, topics in fluids and wave motion, optical instruments, and radioactivity. Three lectures and one laboratory session per week. This course is offered as both ENS 119 and PHY 119.

Prerequisites: MAT 123; CHE 131

DEC: E
SBC: SNW
4 credits

ENS 301: Contemporary Environmental Issues and Policies
The scientific, socioeconomic, legal and legislative aspects of current environmental issues and policies. Invited experts address current environmental issues and policies of local, regional and global significance. Topics may include: land use practices and reform, farmland and open space preservation; soil and water conservation; wetlands protection and rehabilitation; waste management and reduction, recycling and composting; air pollution, global warming and sea level rise; and marine wilderness areas.

Prerequisite: U3 or U4 standing; ENS major or minor or permission of instructor

DEC: H
SBC: STAS
3 credits

ENS 311: Ecosystem Ecology and the Global Environment
Ecosystem ecology with an emphasis on biogeochemical cycling in oceans and on land, as well as on biosphere-atmosphere interactions. Topics include earth system processes such as climate and atmospheric composition, the hydrological cycle, cycling of chemicals such as nutrients and metals in the oceans, the soil cycle, and the fate and transport of materials in the atmosphere. Natural and perturbed systems are discussed. This course is offered as both BIO 386 and ENS 311.

Prerequisites: C or higher in BIO 201; CHE 129 or CHE 131 or CHE 141 or CHE 152
Advisory Prerequisite: MAR 104

DEC: H
SBC: STAS
3 credits

ENS 312: Population, Technology, and the Environment
A study of the biological, social, and economic factors that influence population growth. The development of new technologies and their influence on resource use and the effects that increasing population and changing technologies have on the environment are explored.

Prerequisites: MAR 340; one semester of BIO

DEC: H
SBC: STAS
3 credits

ENS 333: Environmental Law
Survey of the origins of environmental law and the major legislation enacted by Congress and the state of New York. Special emphasis is placed on the application of environmental law to the problem of solid waste management on Long Island. This course is offered as both ENS 333 and POL 333.

Prerequisites: ECO 108; POL 102
3 credits

ENS 339: Economics of Coastal and Marine Ecosystems
This course will view human interactions with coastal and marine ecosystems through the lens of economics. Consideration of the socioeconomic implications of policy decisions involving environmental and natural resources has become increasingly important for ecosystem management. Topics will include the basics of welfare analysis, the concept of ecosystem services, the challenges associated with public goods, methods for economic valuation of non-market goods and services, strategies for sustainable use of coastal and marine resources, and case studies of the application of fundamental principles of environmental economics to national and international policy. This course is offered as both ENS 339 and ENV 339.

Prerequisite: U3/U4 status; ENS 101 or SBC 111 or MAR 104

DEC: H
SBC: STAS
3 credits

ENS 395: Topics in Environmental Sciences
May be repeated as the topic changes.

Prerequisite: one upper division ENS course
3 credits

ENS 443: Environmental Problem Solving
The integration of information and skills from the natural sciences, social sciences, engineering and the humanities to address important environmental problems. An environmental problem of current interest is presented. Working in small groups, students develop a proposal to solve the problem, collect and analyze data, and present results. Data collection may include field and laboratory work outside of scheduled class meetings.

Prerequisites: U3 or U4 standing; ENS major or minor
3 credits

ENS 447: Readings in Environmental Studies
Tutorial readings in the environmental sciences. This course may be repeated but no more than 3 credits may be used toward Environmental Studies major requirements.

Prerequisite: Permission of instructor and SoMAS undergraduate director

1-3 credits, S/U grading

ENS 487: Independent Research in Environmental Studies
An independent project, developed out of advanced coursework in environmental studies, designed in consultation with and supervised by a faculty member. The project should be formulated before the start of the semester in which the research will be done and should culminate in a substantial written paper. May be repeated.

Prerequisites: Permission of a supervising faculty member and SoMAS Undergraduate Programs Director

SBC: EXP+
0-6 credits

ENS 488: Internship in Environmental Studies
Internships provide students with an opportunity of gaining experience working in the community at government agencies, environmental groups, aquaria, summer camps, field studies, etc. A suitable proposal must be presented by the student and approved by the Director of Undergraduate Studies before the internship begins. May be repeated for a maximum of 6 credits for the ENS major, 3 credits for the ENS minor.

*Prerequisite: Permission of the SoMAS Undergraduate Programs Director*

**SBC:** EXP+

0-6 credits, S/U grading