Environmental Studies

ENS 101-E 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 change; 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.

ENS 119-E 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.

ENS 301-H 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.

ENS 311-H 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.

ENS 312-H 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.

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.

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.

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.

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.

ENS 489 Independent Study
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.

ESE 123 Introduction to Electrical and Computer Engineering
Introduces basic electrical and computer engineering concepts in a dual approach that includes laboratories for hands-on wired and computer simulation exercises in analog and logic circuits, and lectures providing concepts and theory relevant to the laboratories. Emphasizes physical insight and applications rather than theory.

ESE 124 Computer Techniques for Electronic Design
An extensive introduction to problem solving in electrical engineering using the ANSI C language. Topics covered include data types, operations, control flow, functions, data files, numerical techniques, pointers, structures, and bit operations. Students gain experience in applying the C language to the solution of a variety of electrical engineering problems, based on concepts developed in ESE 123. Knowledge of C at the level presented in this course is expected of all electrical engineering students in subsequent courses in the major.

ESE 211 Electronics Laboratory A
Introduction to the measurement of electrical quantities; instrumentation; basic circuits, their operation and applications; electronic devices; amplifiers, oscillators, power supplies, wave-shaping circuits, and basic switching circuits.

ESE 218 Digital Systems Design
Develops methods of analysis and design of both combinational and sequential systems regarding digital circuits as functional blocks. Uses demonstrations and laboratory projects consisting of building hardware on breadboards and simulation of design using CAD tools. Topics include number systems and codes; switching algebra and switching functions; standard combinational modules and arithmetic circuits; realization of switching functions; latches and flip-flops; sequential memory, combinational, and sequential PLDs and their applications; design of system controllers.

Perform for engineering majors: PHY 127 or 132/134 or 142 or ESE 124
Perform for computer science majors: CSE 220

ESE 221 Electronics Laboratory B
An introduction to the measurement of electrical quantities; instrumentation; basic circuits, their operation and applications; electronic devices; amplifiers, oscillators, power supplies, wave-shaping circuits, and basic switching circuits.

ESE 231 Introduction to Semiconductor Devices
The principles of semiconductor devices. Energy bands, transport properties, and generation recombination phenomena in bulk semiconductors are covered first, followed by junctions between semiconductors and metal-semiconductor. The principles of operation of diodes, transistors, light detectors, and light emitting devices based on an understanding of the characterization of physical phenomena in semiconductors. Provides background for subsequent courses in electronics.

Perform for engineering majors: PHY 127 or 132/134 or 142; PHY 127 or 132/134 or 142

ESE 227 Electrical Circuit Analysis I
Kirchhoff’s Laws, Ohm’s Law, nodal and mesh analysis for electric circuits, capacitors, inductors, and steady-state AC; transient analysis using Laplace Transform. Fundamentals of AC power, coupled inductors, and two-ports.

Perform for engineering majors: PHY 127 or 132/134 or 142; PHY 127 or 132/134 or 142

ESE 290 Transitional Study
A vehicle used for transfer students to remedy discrepancies between a Stony Brook course and a course taken at another institution. For example, it allows the student to take the laboratory portion of a course for which he or she has had the theoretical portion elsewhere. Open elective credit only.

Perform for engineering majors: PHY 127 or 132/134 or 142

ESE 300 Writing in Electrical/Computer Engineering
See requirements for the majors in Electrical Engineering and Computer Engineering, upper-division writing requirement.