ENVIRONMENTAL SCIENCE, B.S.

Program Description

The Environmental Science Program offers a specialized, integrated approach to global issues surrounding sustainability, the use of natural resources, how human activity impacts ecosystems, how such activity can cause degradation, and what can be done to mitigate this impact.

Why Take This Major?

Our program is designed to place graduates into positions in industry, energy and environmental, governmental and private, as well as in graduate programs (science or policy/management), and service institutions and agencies (Peace Corps, AmeriCorps, etc). Students (have been) and will be qualified to work in fields such as oil, gas and coal, alternative energy, environmental management, resource management, land-use planning, environmental policy, and environmental law (upon completion of law school). The Environmental Science program can also serve as a pre-teaching opportunity that prepares students for certification in education. We also understand the need to enhance critical thinking skills and have designed the environmental science curricula to meet this challenge by requiring an eclectic array of courses from many non-science related departments.

Degree Earned

Bachelor of Science (B.S.)

Required for Graduation

- Courses
  - Major: 18
- Credits
  - Major: 62
  - Total: 123 to 126 depending on electives chosen
- GPA
  - Major: 2.0
  - Cumulative: 2.0

Student Learning Outcomes

- Students should be able to think critically about problems in environmental sciences.
- Students should understand human actions that advance environmental stability as well as those actions that cause environmental degradation.
- Students should be familiar with the biological, chemical and geological processes related to environmental science.
- Students should be able to interpret scientific data in our sciences.
- Students should be able to use a variety of instruments commonly used to collect data in the field and the software that displays that information.
- Students should be able to communicate both orally and in writing concepts that are essential to the understanding of environmental science.

Progress Chart

Level One - Core Courses

12 courses and 2 modules required.

Major Requirements

Major requirements include 4 Level Two ILO requirements*, fulfilled through the major.*

Students must complete **18** courses from this major program.

Code	Title	Credits
Level One - Core Courses		
Universal Required Courses		
Students must complete the following 4 courses.		
ILO 8.1: Written Communication (https://catalog.lasalle.edu/undergraduate/ilo/)		
ENG 110	College Writing I: Persuasion	3
ILO 5.1: Information Literacy (https://catalog.lasalle.edu/undergraduate/ilo/)		
ENG 210	College Writing II: Research	3
ILO 1.1: Understanding Diverse Perspectives (https://catalog.lasalle.edu/undergraduate/ilo/)		
FYS 130	First-Year Academic Seminar [1]	3
ILO 2.1: Reflective Thinking and Valuing (https://catalog.lasalle.edu/undergraduate/ilo/)		
REL 100	Religion Matters	3
Elective Core Courses		
Students must complete 1 course in each of the following 4 ILOs.		
ILO 3.1a: Scientific Reasoning (https://catalog.lasalle.edu/undergraduate/ilo/)		
ENV 153	Introduction to Environmental Science	3
ILO 3.1b: Quantitative Reasoning (https://catalog.lasalle.edu/undergraduate/ilo/)		
MTH 120	Calculus I	4
ILO 6.1: Technological Competency (https://catalog.lasalle.edu/undergraduate/ilo/)		
CSC 152	Computer Technology for the Sciences	3
ILO 8.1a/12.1: Oral Communication/Collaborative Engagement (https://catalog.lasalle.edu/undergraduate/ilo/)		
Choose course within ILO (https://catalog.lasalle.edu/undergraduate/ilo/)		3
Distinct Discipline Core Courses		
Students must complete 1 course in each of the following 4 ILOs. Each course must be from a different discipline. (A "discipline" is represented by the 3- or 4-letter prefix attached to each course.)		
ILO 4.1: Critical Analysis and Reasoning (https://catalog.lasalle.edu/undergraduate/ilo/)		
Choose course within ILO (https://catalog.lasalle.edu/undergraduate/ilo/)		3
ILO 9.1: Creative and Artistic Expression (https://catalog.lasalle.edu/undergraduate/ilo/)		
Choose course within ILO (https://catalog.lasalle.edu/undergraduate/ilo/)		3
ILO 10.1: Ethical Understanding and Reasoning (https://catalog.lasalle.edu/undergraduate/ilo/)		

Choose course within ILO (https://catalog.lasalle.edu/undergraduate/ilo/)		3
ILO 11.1: Cultural and Global Awareness and Sensitivity (https://catalog.lasalle.edu/undergraduate/ilo/)		
Choose course within ILO (https://catalog.lasalle.edu/undergraduate/ilo/)		3
Universal Required Modules		
Students must complete the following 2 non-credit modules. [2]		
ILO 7.1a (https://catalog.lasalle.edu/undergraduate/ilo/)		
Health Literacy Module		
ILO 7.1b (https://catalog.lasalle.edu/undergraduate/ilo/)		
Financial Literacy Module		
Major Requirements		
Level Two		
Students must complete 1 course/learning experience in each of the 4 commitments.		
ILO 2.2: Broader Identity (Capstone Course/Experience) (https://catalog.lasalle.edu/undergraduate/ilo/)		
ENV 450	Capstone (ILO 2.2)	3
Select one ILO from 3.2a, 3.2b, 4.2, 5.2, 6.2, 7.2a, or 7.2b: Expanded Literacies (https://catalog.lasalle.edu/undergraduate/ilo/)		
ENV 310	Introduction to Geographic Information Systems (ILO 3.2a)	3
ILO 8.2b: Effective Expression (Writing-Intensive Course) (https://catalog.lasalle.edu/undergraduate/ilo/)		
BIO 230	BIO 230-Integrated Biology II: Populations and Systems (ILO 8.2b)	4
Select one ILO from 10.2, 11.2, or 12.2: Active Responsibility (https://catalog.lasalle.edu/undergraduate/ilo/)		
ENV 402	Environmental Air Quality (ILO 10.2)	3
All Other Required Courses		
BIO 210	Integrated Biology I- Molecules and Cells	4
BIO 230	BIO 230-Integrated Biology II: Populations and Systems	4
BIO 320	Biostatistics	3
CHM 111	General Chemistry I	4
CHM 112	General Chemistry II	4
CHM 262	Organic Chemistry for The Life Sciences	3
ENV 202	Earth Materials	4
ENV 305	Environmental Chemisty	4
ENV 310	Introduction to Geographic Information Systems	3
ENV 401	Fundamentals of Soil Science	4
ENV 402	Environmental Air Quality	3
ENV 450	Capstone	3
MTH 120	Calculus I	4
POL 316	Environmental Law And Policy	3
Required Electives		
Select three of the following:		9-12
BIO 303	Microbiology	
BIO 319	The Plant Kingdom	
BIO 400	Marine Biology	
BIO 403	Principles of Ecology	
BIO 404	Field Ecology	
ENV 306	Hydrology	
ENV 460	Cooperative Education/Internship	
CHM 311	Instrumental Analysis	
PHY 105	General Physics I	
PHY 106	General Physics II	
ECN 351	Environmental Economics	
ISBT 321	Fundamentals of Energy and Natural Resources	
ISBT 322	Role of Energy and Natural Resources in Modern Society	
ISBT 421	Natural Resource Management	
ISBT 422	Sustainable Energy Development	
ISBT 431	Regulatory Affairs	
PHL 306	Environmental Philosophy	
PHLT 314	Environmental Health in Urban Communities	
Free Electives		
In addition to the requirements listed above, students must take enough courses to the fulfill graduation credit requirements for their School and major.		
Total Credits		**109-112**

1

NOTE. The following students use Level 2 Capstone Experience in Major instead of FYS 130 First-Year Academic Seminar: Honors, BUSCA, Core-to-Core, Transfer, and Non-Traditional/Evening.

2

The Modules are **not** required for Transfer Students, Core-to-Core Students, or BUSCA Students. BUSCA students are required to take modules if/when they pursue a bachelor's degree.

Recommended Course Sequence

Course	Title	Credits
First Year		
First Semester		
ENV 153	Introduction to Environmental Science	3
ENL 153	Laboratory	1
BIO 204 or BIO 205	Antibiotic Discovery or Scientific Discovery: Phage Hunting I	4
	Credits	**8**
Second Semester		
ENV 202	Earth Materials	4
	Credits	**4**
Second Year		
First Semester		
BIO 230	BIO 230-Integrated Biology II: Populations and Systems	4
MTH 120	Calculus I	4
CHM 111	General Chemistry I	4
	Credits	**12**
Second Semester		
CHM 112	General Chemistry II	4
ENV Elective		3-4
	Credits	**7-8**
Third Year		
First Semester		
POL 316	Environmental Law And Policy	3
ENV 310	Introduction to Geographic Information Systems	3
CHM 262	Organic Chemistry for The Life Sciences	3
	Credits	**9**

Second Semester		
ENV 305	Environmental Chemisty	4
ENV 401	Fundamentals of Soil Science	4
BIO 320	Biostatistics	3
	Credits	**11**
Fourth Year		
First Semester		
ENV 402	Environmental Air Quality	3
ENV Elective		3-4
	Credits	**6-7**
Second Semester		
ENV 450	Capstone	3
ENV Elective		3-4
	Credits	**6-7**
	Total Credits	**63-66**

This is an example of a typical schedule, and classes may move around depending on when students declare their major.

Dual Major Requirements

To be determined by Program Director and Chair of other major department.

Minors

- Environmental Science, Minor (https://catalog.lasalle.edu/undergraduate/arts-sciences/natural-sciences/environmental-science-bs/environmental-science-minor/)

Course Descriptions

Environmental Science

ENV 152 Oceanography
This course provides a study of the physical processes that affect the oceans of the earth. Emphasis will be on tides, currents, waves, chemistry of the sea, and geology of ocean basins. Three hours lecture.

ENV 153 Introduction to Environmental Science
This course is an introduction to the field of environmental science. Topics covered include climate change, the human impacts on water quality, the role of soil and agriculture on our food resource, the impacts of air pollution on human health, and the impact of humans on biodiversity. For Environmental Science majors and minors, ENL 153 Introduction to Environmental Science Lab should be taken as a co-requisite.

ENV 155 Earth Science
This course covers various topics pertaining to the earth and its place inthe universe. Major aspects of geology, oceanography, meteorology, and astronomy are studied. Emphasis is placed on the interactions of earth systems, and the evolution of our plane

ENV 202 Earth Materials
This course is an introduction to the materials that make up the earth and their composition, structure, classification and formation. Students will study earth resources and the environmental impact of resource usage. Topics include mineralogy, petrology (the study of rocks), energy, metals, fertilizers, construction/building materials, water and soil. Three hours lecture and three hours lab.

ENV 305 Environmental Chemisty
This course focuses on geochemical processes that occur at or near the surface of the earth which are of particular importance to environmental quality and therefore to humans and ecological systems. Students will explore the foundational concepts required to understand water and soil chemistry, Other topics include the study and use of analytical tools used to determine contamination in sediments, soils and water and the remediation techniques available to cleanup such pollution. Three hours of lecture and three lab hours. Prerequisite(s): CHM 111, CHM 112, ENV 153

ENV 306 Hydrology
Hydrology deals with the physical principles governing the flow of groundwater and surface water. Emphasis will be on well hydraulics and flow system analysis. Topics include water budgets, floods and flood frequency analysis, groundwater supply, steady state and non-steady state flow, hydro-geologic regimes, and introductory groundwater chemistry. Three hours of lecture per week.

ENV 310 Introduction to Geographic Information Systems
Provides an overview of the basic concepts and uses of Geographic Information System (GIS) technology. ArcGIS provides a means to explore data on a spatial level and communicate this information. Students explore GIS tools and learn to manipulate, analyze, visualize, and illustrate geographic data. Students examine relationships, trends and patterns using GIS technology. This course is structured to be a hands-on laboratory that covers both conceptual and technical topics.

ENV 401 Fundamentals of Soil Science
An overview of soil science, covering the physical, chemical and biological properties of soils. Students will gain an understanding of soil formation, the classification of soils, and the chemical/biological reactions that occur in soils. In the laboratory, students will learn methods of soil analysis, including chemical and mineralogical analyses. Three hours of lecture and three hours of laboratory per week. Prerequisite(s): CHM 111, ENV 153, MTH 113 or MTH 120

ENV 402 Environmental Air Quality
This course introduces the causes and effects of air pollutants on humans. The source of pollutants, their physical and chemical behavior in the atmosphere, and strategies to mitigate air pollution will be discussed. Students will also be introduced to systems modeling to understand the flow of sources and sinks of atmospheric pollutants. Three hours of lecture per week. Prerequisite(s): CHM 111, ENV 153, MTH 113 or MTH 120 or permission of instructor

ENV 444 Research in ENV I
This course provides the student with an opportunity to do research with a faculty member. The student and the faculty member agree on the research project before the student registers for the course.

ENV 445 Research in ENV II
This course is a continuation of the 444 research course. It provides the student with an opportunity to continue to conduct research with a faculty member.

ENV 450 Capstone
To be determined. Restriction(s): Senior Level Status

ENV 455 Cooperative Education

ENV 460 Cooperative Education/Internship
This is normally a full-time, paid employment at a cooperating institution/company to provide on-the-job training (part-time positions may qualify). It involves appropriate job-related learning assignments under faculty supervision. Position must be approved by the Program Director. Consult the Associate Director for Experiential Education in the La Salle University Career Center before registering for the course.

ENV 470 Special Topics

Program Contact Information

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