ENVIRONMENTAL SCIENCE MAJOR

Program Overview
The Environmental Science Program provides an interdisciplinary perspective on today's many environmental concerns and prepares students for careers in the ever-growing field of environmental science. Emphasis is placed on developing an understanding of environmental issues from the perspectives of biological science, physical science, and a range of relevant disciplines in the social sciences, humanities and business. The strength and uniqueness of the Environmental Science Program at Saint Joseph's University is a strong foundation in the natural sciences, which is critical to understanding the scientific concepts that underlie all environmental issues. Majors will work through a course of study that will develop an understanding of the basic principles and concepts of biology, chemistry, physics, and mathematics, then move on to a series of upper-level courses in biological sciences, physical sciences, and environmental studies. By choosing upper division courses in the areas that most interest them, each student will have the ability to design a unique course of study that will prepare him or her for a particular environmentally related career. A semester-long internship affords students the opportunity to gain hands-on experience working in the field of environmental science.

Learning Goals and Objectives

Goal 1: Students will develop an understanding of the importance of the environment, the extent to which societal actions impact it, the need for sustainability and how sustainability can be achieved.

Objective 1.1: Students will be able to describe the basic environmental challenges facing the world today, their causes, and possible solutions.

Objective 1.2: Students will be able to describe the scientific, ethical, and moral imperatives behind the need to protect and sustain a healthy environment, and the role of environmental science and environmental scientists in those efforts.

Goal 2: Students will develop an understanding of the opportunities and challenges facing efforts to protect the environment and developing a sustainable society.

Objective 2.1: Students will demonstrate an understanding of the linkages between environmental science and non-natural science disciplines such as business, economics, history, politics, sociology, etc.

Goal 3: Students will develop a strong foundation in the physical and natural sciences, including environmental science, biology, chemistry, and physics.

Objective 3.1: Students will demonstrate knowledge of basic biology, including cell biology, genetics, and organismal biology.

Objective 3.2: Students will demonstrate knowledge of general chemistry and physics.

Goal 4: Students will develop the skills needed for a successful career in Environmental Science, including experimental design, surveying of scientific literature, data collection, data reduction and the presentation of scientific conclusions to a range of audiences.

Objective 4.1: Students will demonstrate competency in operating basic laboratory equipment required to quantify and measure accurately.

Objective 4.2: Students will apply skills in data reduction including choosing and interpreting appropriate statistical tests.

Objective 4.3: Students will be able to develop cogent, well structured, and researched written and oral presentations of scientific material.

Goal 5: Students will understand the types of careers available to environmental scientists, create connections with people in the field of environmental science, and receive hands-on experience in the working world.

Objective 5.1: Students will demonstrate an understanding of the role of environmental science and scientists in societal efforts towards sustainability and complete an internship applying their knowledge to real-world issues alongside environmental professionals.

Requirements for the Environmental Science Major
The traditional undergraduate programs include 40 courses distributed across three components: A General Education component divided into Signature Courses, Variable Courses, and an Integrative Learning requirement; a Major and Divisional component; and Free Electives. In addition to course requirements as specified in each area, students must complete one certified course in each of the following overlay areas:

1. Diversity, Globalization or Non-western Area Studies,
2. Ethics Intensive, and
3. Writing Intensive. Overlay requirements are part of the forty-course requirement.

General Education Signature Courses
See this page about Signature courses (https://academiccatalog.sju.edu/curricula/#signature). Six courses

General Education Variable Courses
See this page about Variable courses (https://academiccatalog.sju.edu/curricula/#variable). Six to Nine courses

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<tr>
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<th>Hours</th>
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<tr>
<td>Mathematics</td>
<td>Fundamentals of Calculus</td>
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<tr>
<td></td>
<td>Calculus I</td>
<td></td>
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<tr>
<td>Natural Science</td>
<td>Bio I: Cells</td>
<td>4</td>
</tr>
<tr>
<td>BIO 101 &amp; 101L</td>
<td>and Bio I: Cells Lab</td>
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General Education Overlays
See this page about Overlays (https://academiccatalog.sju.edu/curricula/#overlay).

General Education Integrative Learning Component
See this page about Integrative Learning Component (https://academiccatalog.sju.edu/curricula/#integrative-learning). Three courses
Environmental Science Major

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<thead>
<tr>
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<tbody>
<tr>
<td>Biology</td>
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<td>BIO 102 &amp; 102L</td>
<td>Bio II: Genetics and Bio II: Genetics Lab</td>
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<td>Chemistry</td>
<td>General Chemistry I &amp; General Chemistry Lab I</td>
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<tr>
<td>Mathematics</td>
<td>Applied Statistics</td>
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GEP Electives
Six courses

Major Requirements
Fifteen courses

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<td>Biology</td>
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<tr>
<td>BIO 201 &amp; 201L</td>
<td>Bio III: Organismic Biology and Bio III: Organismic Biol Lab</td>
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<tr>
<td>Environmental Science</td>
<td>Exploring the Earth and Exploring the Earth Laboratory</td>
<td>4</td>
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<tr>
<td>CHEM 106 &amp; 106L</td>
<td>Environ Theory &amp; Ethics Sem</td>
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<tr>
<td>Chemistry</td>
<td>General Chemistry II &amp; General Chemistry Lab II</td>
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<tr>
<td>CHEM 210 &amp; 210L</td>
<td>Organic Chemistry I and Organic Chemistry Lab I</td>
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<tr>
<td>Physics</td>
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<td>Select one of the following:</td>
<td>General Physics I and General Physics Laboratory I</td>
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<tr>
<td>Select one of the following:</td>
<td>University Physics I and University Physics Lab I</td>
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<tr>
<td>Internship</td>
<td>Environmental Sci Internship (junior or senior year)</td>
<td>3</td>
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Select one from each of the following groups:

Group A: Biological Sciences

BIO 401 Animal Behavior
BIO 405 Biomechanics
BIO 409 Ecology
BIO 413 Plant Physiological Ecology
BIO 414 Plant Systematics
BIO 416 Microbiology
BIO 419 Invertebrate Zoology
BIO 422 Applied & Environmental Micro
BIO 423 Evolution

Group B: Physical Science

CHM 420 Environmental Chemistry
CHM 460 Water Chemistry
CHM 215 Organic Chemistry II & 215L Organic Chemistry Lab II

Select one of the following:

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<tbody>
<tr>
<td>PHY 102 &amp; 102L</td>
<td>General Physics II and General Physics Laboratory II</td>
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<tr>
<td>PHY 106 &amp; 106L</td>
<td>University Physics II and University Physics Lab II</td>
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Group C: Environmental Studies

DSS 460 Geographic Information Systems
ECN 370 Economic Development
ECN 375 Environmental Economics
ENG 426 Nature Writing in America
ENG 433 Writing and Environment Justice
HIS 386 American Environmental History
LEO 212 Organizational Sustainability
MKT 150 People, Planet and Profit
MKT 450 Marketing Study Tour
PHL 316 Food and Justice
POL 327 Environmental Politics in Am
SOC 316 Fair Trade: Coffee-Co-Op to Cup

Select four additional upper level environmental science electives

In addition, enrollment in ENV 390 Environmental Science Seminar, is required each semester.