

# ENVIRONMENTAL SCIENCE MAJOR

The Environmental Science Program prepares students for careers in the ever-growing field of environmental science. The curriculum of the Environmental Science Program emphasizes a deep understanding of contemporary environmental and sustainability issues through an interdisciplinary approach. This approach reflects the interdisciplinary nature of the requirements for careers in environmental related fields in academia, industry, government, non-profit and service organizations. Students enrolled in the major will work through a course of study that will develop a strong foundation in the natural sciences and mathematics while also exploring the complex interconnected nature of sustainability and environmental topics through courses focused on environmental topics in the humanities, social sciences, and business. Students have the opportunity to choose a course of study that focuses on what interests them most. Students also complete a semester-long experiential learning requirement that aims to give graduates an inside understanding of career paths for environmental science graduates. This course of study coupled with the General Education Curriculum at Saint Joseph's University creates a transformative Jesuit education that prepares graduates to be agents of change in their communities through both professional and personal action.

## Learning Goals and Outcomes

**Goal 1:** Students will develop an interdisciplinary 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.

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

**Outcome 1.2:** Students will be able to describe the scientific, ethical, and moral imperatives behind the need to protect and sustain the environment.

**Goal 2:** Students will develop a strong foundation in the physical and natural sciences, including environmental science, biology, chemistry, and physics, as well as quantitative skills such as statistics and computation.

**Outcome 2.1:** Students will be able to explain basic concepts in biology, general chemistry, and physics.

**Outcome 2.2:** Students will be able to apply quantitative and computer skills such as statistics and Geographic Information Systems to answer research questions and implement solutions.

**Goal 3:** Students will develop the skills needed for a successful career in Environmental Science, including presentation skills, networking, and familiarity with career paths in the field.

**Outcome 3.1:** Students will be able to communicate scientific research through written and oral formats.

**Outcome 3.2:** Students will be able to improve and apply their skills to real-world issues in an internship with environmental professionals.

## Requirements

### Cornerstone Core Curriculum Requirements

Consist of 14 core and 2 overlay requirements. See below for additional detailed information on each of these requirements.

Code	Title	Hours
<b>First Year Course Requirements</b>		
ENG 101	Craft of Language	3
World History Course Area		3
<b>Philosophy Requirements</b>		
Either Level One or Level Two (but not both) – must be Ethics designated. If approved, philosophy courses may count for a student's Writing Intensive overlay. Students may not double-count the same course as Philosophy Level Two and as a Mission Overlay course.		
Philosophy Level One		3
Philosophy Level Two		3
<b>Theology &amp; Religious Studies Requirements</b>		
If approved, Theology & Religious Studies courses may count for a student's Writing Intensive overlay. Students may not double-count the same course as CCC Theology and as a Mission Overlay course.		
Theology		3
Religious Studies		3
<b>Diversity &amp; INT 151 Requirements</b>		
A student's Diversity course may not count for any other CCC course area requirement or as their Mission Overlay course. If approved, Diversity courses may count for a student's Writing Intensive Overlay requirement. INT 151 may not count for any other CCC requirements. This course must be taken in the first two years		
Diversity		3
INT 151	Inequality in American Society	1
<b>Math &amp; Natural Science Requirements</b>		
If approved, Math & Natural Science Requirements may count toward overlay requirements.		
Mathematics		3-4
Natural Science		4
<b>Social Science Requirement</b>		3
If approved, such Social Science Requirement may count toward a student's overlay requirements.		
<b>Non-Native Language Requirement</b>		3-4
A single Non-Native Language course may not count as an overlay course but a second language course fulfills a student's Mission Overlay requirement.		
<b>Literature Requirement</b>		3
If approved, Literature courses may count toward a student's overlay requirements.		
<b>Fine and Performing Arts, Creativity, and Design Requirement</b>		3
If approved, Fine and Performing Arts, Creativity, and Design courses may count toward a student's overlay requirements.		
<b>Overlay Requirements</b>		
Writing-Intensive		3

If approved, Writing-Intensive courses may double count as major courses, minor courses, electives, or as any CCC course area requirement except for the first-year courses (World History and Rhetoric and Composition).	
Mission-Overlay	3
Mission Overlay courses may double count as major courses, minor courses, elective courses, or any of the following CCC course areas: Fine and Performing Arts, Creativity, and Design, Literature, Mathematics, Natural Science, or Social Science.	
<b>Total Hours</b>	<b>47-49</b>

Major Requirements

Code	Title	Hours
BIO 101	Bio I: Cells (will count for CCC: Natural Science)	4
BIO 101L	Bio I: Cells Lab (will count for CCC: Natural Science)	0
BIO 102	Bio II: Genetics	4
BIO 102L	Bio II: Genetics Lab	0
BIO 201	Bio III: Organismic Biology	4
BIO 201L	Bio III: Organismic Biol Lab	0
BIO 429	Environmental Science	4
BIO 429L	Environmental Science Lab	0
CHM 120	General Chemistry I	3
CHM 120L	General Chemistry Lab I	1
CHM 125	General Chemistry II	3
CHM 125L	General Chemistry Lab II	1
CHM 210	Organic Chemistry I	3
CHM 210L	Organic Chemistry Lab I	1
ENV 102	Environmental Ethics	3
ENV 390	Environmental Science Seminar (each semester in major)	0
ENV 490	Environmental Sci Internship (junior or senior year)	3
MAT 128	Applied Statistics	3
<b>Mathematics (will count as CCC: Mathematics)</b>		<b>3-4</b>
MAT 155	Fundamentals of Calculus	
MAT 161	Calculus I	
<b>Select one of the following:</b>		<b>4</b>
PHY 101 & 101L	General Physics I and General Physics Laboratory I	
PHY 105 & 105L	University Physics I and University Physics Lab I	
<b>Select one from each of the following groups:</b>		
<b>Group A: Biological Sciences</b>		<b>4</b>
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 & Environ Microbiology	
BIO 423	Evolution	
BIO 472	Aquatic Biology	

BIO 472L	Aquatic Biology Lab	
<b>Group B: Physical Science</b>		<b>3</b>
ENV 302	Environmental Geology	
ENV 440	Environmental Toxicology	
CHM 420	Atmospheric Environmental Chem	
CHM 460	Water Chemistry	
CHM 215 & 215L	Organic Chemistry II and Organic Chemistry Lab II	
PHY 102 & 102L	General Physics II and General Physics Laboratory II	
PHY 106 & 106L	University Physics II and University Physics Lab II	
<b>Group C: Environmental Studies</b>		<b>3</b>
ART 146	Sculpture and the Environment	
ART 177	Photography & Climate Crisis	
BIO 360	God and Evolution	
ECN 375	Environmental Economics	
SPA 322	Environ Challenges LatAmerica	
ENG 314	Irish Environmental Writing	
ENG 426	Nature & Environmental Writing	
ENG 433	Environmental Justice	
ENG 434	Climate Change Stories	
ENV 471	Environmental Law	
GIS 101	Introduction to GIS	
GIS 175	Environmental Economics	
GIS 201	Intermediate GIS	
HIS 386	American Environmental History	
MGT 212	Organizational Sustainability	
PHL 295	Philosophy of the Environment	
SOC 316	Fair Trade Coffee: Study Tour	
THE 339	Darwin, Dogma, and Ecology	
<b>Select four additional upper-level environmental science electives.</b>		<b>12</b>
<b>Total Hours</b>		<b>66-67</b>

Free Electives

Graduation requires 120 credits. Any credits necessary to reach that number outside of the CCC and major requirements are considered free electives.

Typical Course Sequence

Course	Title	Hours
<b>Freshman</b>		
<b>Fall</b>		
BIO 101 & 101L	Bio I: Cells and Bio I: Cells Lab	4
MAT 155 or MAT 161 or MAT 120	Fundamentals of Calculus or Calculus I or Precalculus	3
Non-Native Language		3
ENG 101	Craft of Language	3
World History		3
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
BIO 102 & 102L	Bio II: Genetics and Bio II: Genetics Lab	4

MAT 128	Applied Statistics	3
Theology		3
Philosophy Level One		3
INT 151	Inequality in American Society	1
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>14</b>
<b>Sophomore</b>		
<b>Fall</b>		
BIO 201 & 201L	Bio III: Organismic Biology and Bio III: Organismic Biol Lab	4
CHM 120 & 120L	General Chemistry I and General Chemistry Lab I	4
Social Science		3
Major Elective C / Writing intensive Overlay		3
Philosophy Level Two		3
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>17</b>
<b>Spring</b>		
BIO 429 & 429L	Environmental Science and Environmental Science Lab	4
ENV 102	Environmental Ethics	3
CHM 125 & 125L	General Chemistry II and General Chemistry Lab II	4
Free Elective		3
Diversity		3
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>17</b>
<b>Junior</b>		
<b>Fall</b>		
Major Elective		3-4
CHM 210 & 210L	Organic Chemistry I and Organic Chemistry Lab I	4
Group C Major Elective		3
Literature		3
Free Elective		3
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>16-17</b>
<b>Spring</b>		
Group B Major Elective		3-4
Major Elective		3
Religious Studies		3
Free Elective		3
Fine & Performing Arts, Design & Creativity		3
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>15-16</b>
<b>Senior</b>		
<b>Fall</b>		
Free Elective		3
Overlay		3
PHY 101 & 101L	General Physics I and General Physics Laboratory I	4
Major Elective		3
ENV 490	Environmental Sci Internship	3
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
Free Elective semester	minimum credits here or elsewhere up to 120 total, with minimum 12 credits this semester	12
ENV 390	Environmental Science Seminar	0
<b>Hours</b>		<b>12</b>
<b>Total Hours</b>		<b>123-125</b>