

# Environmental Studies

The environmental studies program draws on the expertise of faculty distributed throughout the academic disciplines at Whitworth to provide a robust interdisciplinary approach to the study of the natural world. The program integrates insights from the natural sciences, social sciences, humanities and theology to develop students' environmental literacy and competence, providing a holistic education that encourages thoughtful and informed care of the earth and its creatures. Both interdisciplinary majors that are a part of the program require students to develop competence across a range of fields. The B.A. in environmental studies focuses in particular on the social, political, ethical and religious dimensions of environmental challenges and opportunities, while the B.S. in environmental science focuses on the physical and biological dimensions, providing a thorough grounding in the sciences. Both programs reflect Whitworth's long-standing commitment to the care of creation as an integral part of our mission to love the God who created all things, to follow Christ who redeems all things, and by the power of the Spirit to serve our fellow human beings with whom we are bound to the life of all of creation.

## Student Learning Outcomes

Environmental studies programs will equip Whitworth students with:

1. **Critical Thinking.** Students develop an ability to think critically about some of the most pressing questions of our day by considering the environmental impact of their personal and professional decisions.
2. **Interdisciplinary Competence.** Students are able to assess the causes and consequences of environmental issues from the perspective of the natural and social sciences, theology and the humanities.
3. **Faith and Learning.** Students actively demonstrate the application of their faith or worldview to care for the whole creation.
4. **Effective Communication.** Students will communicate about the causes and consequences of environmental issues from an interdisciplinary perspective in both oral and written form.
5. **Field Skills.** Students will spend time in the field, experiencing a broad array of field-based environmental skills, preparing them for future careers as environmental professionals.

## Requirements for an Environmental Science Major, B.S. (55-58)

### ENS Core Courses (9)

BI 120	Introduction to Environmental Science	3
PO 250	Environmental Politics	3
One of the following:		3
TH 212	Redemption of Creation	
TH 214	Theology & Ecology	

### General Science Requirements (20)

BI 140	General Biology I: Genes, Cells and Evolution	4
BI 143	General Biology II: Ecology and Evolution	4
BI 240	General Biology III: Organismal Diversity	4
CH 161	General Chemistry I	3
CH 161L	General Chemistry I Lab	1
CH 181	General Chemistry II	3
CH 181L	General Chemistry II Lab	1

### Chemistry Requirements (7)

CH 271	Organic Chemistry I	3
CH 271L	Organic Chemistry I Lab	1
CH 331	Environmental Chemistry	3
or CH 331W	Environmental Chemistry	

### Ecology Requirements (8)

BI 347	Global Change Ecology	4
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or BI 347W	Global Change Ecology	
BI 405	Ecological Measures	4
or BI 405W	Ecological Measures	
Field Intensive Requirements (one of the following)		3-4
BI 341	Central American Field Ecology	
BI 346	Field Parasitology	
ENS 348H	Ecological Field Research	
*Approved Au Sable Field-Based Course		
Geographic Information Systems (one of the following)		3-4
ENS 255	Introduction to GIS	
*Au Sable course EnvST 362 Environmental Applications for GIS		
Seminar (2)		2
ENS 301	Environmental Studies Seminar	
ENS 401	Environmental Studies Seminar	
One additional course from the ENS major electives list (must be 200 or higher)		3-4
Students pursuing the Environmental/Sustainability Education endorsement must take the following among their electives:		
EDU 343	Science: K-9 Methods and Assessment	
or EDU 455W	Science in Secondary School	
EDU 410	Environmental and Sustainability Education in the K-12 Classroom	

## Requirements for an Environmental Studies Major, B.A. (35-39)

ENS Core Courses (9 credits)		
BI 120	Introduction to Environmental Science	3
PO 250	Environmental Politics	3
One of the following:		3
TH 212	Redemption of Creation	
TH 214	Theology & Ecology	
Environmental Science Courses (7)		
BI 347	Global Change Ecology	4
ENS 255	Introduction to GIS	3
Field Intensive Requirement (one of the following)		3-4
BI 341	Central American Field Ecology	
ENS 348H	Ecological Field Research	
*Approved Au Sable Field-Based Course		
Environmental Writing (one of the following)		3
EL 357	Creative Nonfiction Workshop: Environmental and Nature Writing	
EL 210	Composition for Writers (Environmental Writing Section)	
Environmental Ethics (3)		3
ENS 302W	Environmental Ethics	
Society and the Environment (one of the following)		3
HI 384	Pacific Northwest History	
EC 350	Environmental Economics	
SO 360	Sociology of the Environment	
PO 359	Global Environmental Politics	
Seminar - Must take both (2)		2
ENS 301	Environmental Studies Seminar	
ENS 401	Environmental Studies Seminar	

Two additional courses from the ENS major elective list. At least one must be 200 level or higher.	5-8
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Students pursuing the specialty endorsement in Environmental/Sustainability Education (ESE) must take the following among their electives:

EDU 343 or EDU 455W	Science: K-9 Methods and Assessment Science in Secondary School
EDU 410	Environmental and Sustainability Education in the K-12 Classroom

## Requirements for an Environmental Studies Minor (20-25)

ENS 120 or BI 120	Introduction to Environmental Science Introduction to Environmental Science	3
PO 250	Environmental Politics	3
One of the following:		3
TH 212	Redemption of Creation	
TH 214	Theology & Ecology	

Four courses total, at least one from the Natural Science category and one from the Social Science/Humanities category	11-16
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Students pursuing the Environmental/Sustainability Education endorsement must take the following among their electives:

EDU 343	Science: K-9 Methods and Assessment **
EDU 410	Environmental and Sustainability Education in the K-12 Classroom **

\* Selected sections only. Please see your advisor.

\*\* Students fulfilling requirements for the ESE endorsement should take EDU 410 AND either EDU 343 OR EDU 455.

### Environmental Science/Studies Elective Courses

Natural Science Electives		
BI 102	Introductory Biology	3
BI 105	Plants in Culture	3
BI 111	Marine Biology	3
BI 303	Plant Taxonomy	4
BI 304	Ecological Measures	4
BI 311	General Biochemistry	3
BI 323	Animal Physiology	4
BI 324	Animal Behavior	4
BI 331	Plant Physiology	4
BI 341	Central American Field Ecology	3
BI 345	Ecology	4
BI 347	Global Change Ecology	4
BI 350	Comparative Vertebrate Anatomy	4
BI 363	Genetics	4
BI 365	Ecological Developmental Biology	4
BI 381	Statistical Applications for Biology	3
BI 399	Molecular Genetics	4
CH 111	Green Chemistry	3
CH 112	Chemistry and Health	3
CH 122	Chemistry in Modern Living	3
CH 331	Environmental Chemistry	3

GL 139	Environmental Geology	3
NS 101	Earth and Sky	3
Social Science Electives		
EC 350	Environmental Economics	3
EC 381	Sustainable Development Abroad: Poverty, And Environmental Sustainability"	3
EL 110	Writing & Design	3
EL 210	Composition for Writers (Environmental Writing Section)	3
EL 357	Environmental and Nature Writing	3
HI 384	Pacific Northwest History	3
PO 359	Global Environmental Politics	3
SO 360	Sociology of the Environment	3
SO 465	Population Analysis	3
TH 212	Redemption of Creation	3
TH 214	Theology & Ecology	3
TH 302W	Environmental Ethics	3

\*These courses may have prerequisites that are not included in the major. Please refer to the catalog and talk with your advisor when planning to take these courses.

## Courses

### **ENS 120 Introduction to Environmental Science** 3

Overview of how science informs our approach to,environmental concerns, with application to,specific current environmental challenges,,including water resources, energy, land use,,biodiversity, and global change. Also discussed,how faith integrates with science to shape our,approach to the environment. Meets natural,science requirement. Also listed as BI 120.,Spring semester.

### **ENS 250 Environmental Politics** 3

Studies the role of markets, governments, and,civil society in shaping the way people behave,toward the environment, focusing on the concept,of,sustainability in terms of society, economics and,the environment. Because people interact in a,variety of ways, the course moves from local to,global and focuses on issues at each level. Also,listed as PO/EC 250.

### **ENS 255 Introduction to GIS** 3

Introduction to the collection, management,,analysis, and presentation of spatial data using,the tools of Geographic Information Systems and,Global Positioning Systems. Includes 3 full-day,field trips during the week.

### **ENS 301 Environmental Studies Seminar** 1

Prepares environmental studies students for next,steps in environmental careers. Intended for,sophomores or juniors in the environmental studies,program. Students prepare for an internship,,research experience, or environmentally related,temporary employment.

### **ENS 302W Environmental Ethics** 3

An exploration of scientific, philosophical, and,religious views concerning the non-human world and,our responsibilities towards other creatures,,fellow human beings, and future generations.,Includes readings in classic environmental texts,,a service learning component, and a focus on,practical issues relevant to the northwestern,United States.

### **ENS 303 Plant Taxonomy** 4

History, theories and methods of classification,,identification, nomenclature and description.,Role of taxonomy as a biological discipline.,Types of taxonomic evidence. Descriptive,terminology. Survey of selected families. Lab,focuses on use and construction of diagnostic,keys,identification of local flora, preparation,of,field data records and herbarium specimens. Lab. ,Prerequisites: BI 140 and BI 141. Also listed as,BI 303. Spring semester, even years.

- ENS 305 Landscape Ecology** 4  
Landscape ecology is the study of the causes and,consequences of landscape-scale pattern and,process. Topics will include ecological scale,,restoration ecology, disturbance ecology,,ecological modeling, and geospatial ecological,techniques. Includes 1 Saturday field trip.,Prerequisite: BI 345. Also listed as BI 305.,Spring semester. Periodic offering.
- ENS 305W Landscape Ecology** 4  
Landscape ecology is the study of the causes and,consequences of landscape-scale pattern and,process. Topics will include ecological scale,,restoration ecology, disturbance ecology,,ecological modeling, and geospatial ecological,techniques. Includes 1 Saturday field trip.,Prerequisite: BI 345. Spring semester.
- ENS 310 Northwest Writers** 3  
Readings from a diverse group of Northwestern,poets, fiction writers, and creative nonfiction,writers, with consideration of central themes and,concerns shared among them. Explores the,relationship between these writers and their,region. Also listed as EL 310.
- ENS 331L Environmental Chemistry Lab** 1  
Explore the laboratory methods typical in,environmental analysis. Includes sampling,techniques, use of certified protocol(s), and,spectroscopic and instrumental analysis. Also,listed as ENS-331L. Corequisite: concurrent,enrollment in CH331, CH331W, or ENS331. Spring,semester even years.
- ENS 347 Global Change Ecology** 4  
This course will explore global-scale changes and,the interplay of ecosystems with these changes. ,Topics will explore how changes such as global,warming, invasive species and land degradation,influence global nutrient and energy cycling,,inter- and intra-species interactions, and,feedbacks in the earth system.
- ENS 348H Ecological Field Research** 3  
Students design and carry out ecological research,projects and learn sampling design, field research,techniques, statistical analysis, and presentation,skills.
- ENS 357W Environmental and Nature Writing** 3  
Students will read contemporary examples of,environmental and nature writing. They will,produce, workshop, and revise texts about,experiences in nature and current environmental,issues.
- ENS 360 Sociology of the Environment** 3  
This course explores social issues related to,environmental justice using theories and concepts,from the field of Sociology. Sociological issues,addressed include inadequate access to healthy,food, inadequate transportation, air and water,pollution, unsafe homes, etc. Students will,examine contemporary environmental concerns,associated with the unequal distribution of,environmental hazards across societies, social,groups, and communities. Students will explore the,social, industrial, and government forces that,create inequitable burdens of environmental,pollution as well as movements to reduce such,burdens. This course considers the global impact,of environmental injustices.
- ENS 365 Ecological Developmental Biology** 4  
Developmental processes as they are influenced by,their environmental context including: predators,,competitors, toxic compounds, changes in,temperature and humidity, availability of,nutritional resources, and other factors. The,influence of epigenetics and evolutionary,adaptation on developmental plasticity will also,be examined. Additionally, the course will,explore insights gained into human health and,disease by examining topics mentioned above.,Prerequisite: Take BI-240. Corequisite: Take,BI-365L. Corequisite or prerequisite: Take BI-311,or CH-401. Spring term, odd years.
- ENS 381 Sustainable Development Abroad: Poverty,,Inequality, Environment, Social Change** 3

Establishes a basic understanding of the theory, and practical application of the "hows" and, "whys" of a particulate international culture, abroad, particularly as it relates to the, historic, present and future challenges of that, economy and to doing business with various people, groups at home and abroad. Business models unique, to non-American cultures will be explored in, depth. Also listed as DS 381. Also listed as a LAS, 381.

**ENS 401 Environmental Studies Seminar**

**1**

Prepares environmental studies students for next, steps in environmental careers. Intended for, seniors in the environmental studies program., Students present on past research or internship, experiences and lead journal review discussions.

**ENS 448 Environmental Microbiology**

**4**

This course will examine the applied effects of, microorganisms on the environment and on human, activity, health and welfare. The role of, microbes in municipal waste treatment., bioremediation and agriculture will be discussed., The laboratory component of the course will, explore the detection and quantitation of, microbial activity, including cultural., microscopic, physiological and molecular, approaches. Prerequisites: BI-140, BI-141 and, CH-271. Also listed as BI 448. Periodic offering.

**ENS 480 Field Study**

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