

ENVIRONMENTAL SCIENCES UNDERGRADUATE MAJOR (BS, HBS)

This major offers the following option(s):

- Alternative Energy (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/alternative-energy-option/>)
- Applied Ecology (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/applied-ecology-option/>)
- Aquatic Biology (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/aquatic-biology-option/>)
- Chemistry and the Environment (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/chemistry-environment-option/>)
- Conservation, Resources, and Sustainability (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/conservation-resources-sustainability-option/>)
- Earth Systems (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/earth-systems-option/>)
- Environmental Agriculture (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-agriculture-option/>)
- Environmental Policy and Economics (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-policy-economics-option/>)
- Environmental Science Education (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-science-education-option/>)
- Environmental Water Resources (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-water-resources-option/>)

Also available at OSU-Cascades and via Ecampus.

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Environmental Sciences Undergraduate Program

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An Environmental Sciences undergraduate degree provides a rigorous education that can lead to helping to understand and resolve some of today's most challenging scientific and policy issues—including global climate change, pollution, biodiversity conservation, sustainability,

and balancing resource use and preservation. To help reach these objectives, the Bachelor of Science in Environmental Sciences offers an interdisciplinary approach to environmental problem solving. As an Environmental Sciences major, a student completes course work in four general areas:

1. OSU's general education courses (the baccalaureate core)
2. Basic science and math
3. Environmental sciences and humanities core
4. A specialization area

In addition, each student completes a minimum of 3 credits of experiential learning as an internship, research, study abroad, or field course. The BS degree in Environmental Sciences provides excellent training for a variety of careers—including work with federal, state, and local agencies, industry, non-profits, and education—or for graduate school. Students can pursue the BS degree either at the Corvallis campus or online through OSU Ecampus.

Major Code: 657

- Identify and define concepts in the natural sciences (e.g. chemistry, atmospheric sciences, ecology, geology, oceanography, soil science).
- Identify and define concepts in the humanities and social sciences (e.g. economics, environmental law, ethics, resource policy, and human-environment interaction fields like agronomy and geography).
- Integrate concepts in the natural sciences with those in the humanities and social sciences.
- Demonstrate a rigorous cross-disciplinary science base (biological, physical, and social sciences) with a deeper knowledge in a specialization area by using quantitative tools to analyze and interpret data.
- Communicate ideas clearly- orally, graphically, or in writing- to address environmental sciences issues.
- Engage in and experience the application of the environmental sciences beyond the classroom through fieldwork, participation in an internship, research, study abroad, or other forms of experiential learning.

Major Curriculum

The Environmental Sciences major requires credits in seven categories: 48 credits of baccalaureate core; 51–53 credits of basic science and math; 27–36 credits of environmental sciences and humanities; 27–31 credits of specialization; 3 credits writing intensive course; 3 credits minimum of experiential learning; and 4–53 credits of elective courses (depends on the number of baccalaureate core electives that will also meet requirements of the major).

Baccalaureate Core

The university baccalaureate core course (BCC) requirement is met with 48 credits and a writing intensive course (WIC). The environmental sciences student satisfies the general education requirement by selecting 27 unrestricted credits from the general list of approved courses and 21 credits from a restrictive list of BCC courses, which simultaneously satisfy requirements for the Environmental Sciences major. The WIC and Synthesis requirements are satisfied by courses taken as part of the environmental sciences core curriculum.

Code	Title	Credits
Baccalaureate Core		
Select 48 credits		48
Basic Science and Math Courses		

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Select one of the following biology series: 12

- BI 221 *PRINCIPLES OF BIOLOGY: CELLS
& BI 222 and *PRINCIPLES OF BIOLOGY: ORGANISMS
& BI 223 and *PRINCIPLES OF BIOLOGY: POPULATIONS
- BI 204 *INTRODUCTORY BIOLOGY I
& BI 205 and *INTRODUCTORY BIOLOGY II
& BI 206 and *INTRODUCTORY BIOLOGY III

Select one of the following chemistry series: 15

- Series A
- CH 121 GENERAL CHEMISTRY
& CH 122 and *GENERAL CHEMISTRY
& CH 123 and *GENERAL CHEMISTRY
- Series B
- CH 231 GENERAL CHEMISTRY
& CH 261 and *LABORATORY FOR CHEMISTRY 231 ¹
 - CH 232 GENERAL CHEMISTRY
& CH 262 and *LABORATORY FOR CHEMISTRY 232 ¹
 - CH 233 GENERAL CHEMISTRY
& CH 263 and *LABORATORY FOR CHEMISTRY 233 ¹

Select one of the following: 8

- MTH 251 *DIFFERENTIAL CALCULUS
& MTH 252 and INTEGRAL CALCULUS ¹
- MTH 227 *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I
& MTH 228 and CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II

Select one of the following: 8-10

- PH 201 *GENERAL PHYSICS
& PH 202 and *GENERAL PHYSICS ¹
- PH 211 *GENERAL PHYSICS WITH CALCULUS
& PH 212 and *GENERAL PHYSICS WITH CALCULUS ¹
- ST 351 INTRODUCTION TO STATISTICAL METHODS
& ST 352 and INTRODUCTION TO STATISTICAL METHODS ¹

Environmental Sciences and Humanities Core

Orientation

ENSC 101 ENVIRONMENTAL SCIENCES ORIENTATION ¹ 1

Natural Environmental Systems

Select one Atmosphere course: 4

- ATS 201 *CLIMATE SCIENCE ¹
- ATS 310 METEOROLOGY
- ATS 420 CLIMATE PHYSICS
- GEOG 323 ^CLIMATOLOGY

Select one Biosphere course: 3

- BI 370 ECOLOGY ¹
- GEOG 324 ^ECOLOGICAL BIOGEOGRAPHY

Select one Geosphere course: 3-4

- CSS 205 *SOIL SCIENCE
- GEO 201 *PHYSICAL GEOLOGY
- GEO 202 *EARTH SYSTEMS SCIENCE
- GEO 221 *ENVIRONMENTAL GEOLOGY
- GEO 322 SURFACE PROCESSES
- GEOG 102 *PHYSICAL GEOGRAPHY
- SOIL 205 SOIL SCIENCE
& SOIL 206 and *SOIL SCIENCE LABORATORY FOR SOIL 205 ¹
- SOIL 395 **WORLD SOIL RESOURCES

Select one Hydrosphere course: 3-5

- FW 456 FRESHWATER ECOLOGY AND CONSERVATION
- GEO 487 HYDROGEOLOGY
- GEOG 340 *INTRODUCTION TO WATER SCIENCE AND POLICY ¹
- GEOG 424 HYDROLOGY FOR WATER RESOURCES MANAGEMENT
- OC 201 *OCEANOGRAPHY

Humans and the Environment

Select one Environmental Economics and Policy course: 3-4

- AEC 250 *INTRODUCTION TO ENVIRONMENTAL ECONOMICS AND POLICY
- AEC 253 *ENVIRONMENTAL LAW, POLICY, AND ECONOMICS

- AEC 351 *NATURAL RESOURCE ECONOMICS AND POLICY
 - AEC 352/ECON 352 *ENVIRONMENTAL ECONOMICS AND POLICY ¹
 - AEC 432 ENVIRONMENTAL LAW
 - ECON 201 *INTRODUCTION TO MICROECONOMICS ¹
 - FOR 462 NATURAL RESOURCE POLICY AND LAW
 - FW 324 *FOOD FROM THE SEA
 - FW 415 FISHERIES AND WILDLIFE LAW AND POLICY
 - FW 422 INTRODUCTION TO OCEAN LAW
 - FW 462 ECOSYSTEM SERVICES
 - GEOG 340 *INTRODUCTION TO WATER SCIENCE AND POLICY
 - GEOG 450 LAND USE IN THE AMERICAN WEST
 - GEOG 451 PLANNING PRINCIPLES AND PRACTICES FOR RESILIENT COMMUNITIES
 - PPOL 446 THE POLICY AND LAW OF U.S. COASTAL GOVERNANCE
 - PPOL 447 INTEGRATED POLICY: FOOD, ENERGY, WATER, CLIMATE
 - PPOL 448 MARINE POLICY IN THE UNITED STATES
 - PS 473 US ENERGY POLICY
 - PS 475 ENVIRONMENTAL POLITICS AND POLICY ¹
 - PS 476 *SCIENCE AND POLITICS
 - PS 477 INTERNATIONAL ENVIRONMENTAL POLITICS AND POLICY
 - SOC 360 *POPULATION TRENDS AND POLICY
 - WGSS 440 *WOMEN AND NATURAL RESOURCES
- Select one Environmental Ethics course: 3-4
- ANTH 481 *NATURAL RESOURCES AND COMMUNITY VALUES
 - CH 374 *TECHNOLOGY, ENERGY, AND RISK
 - ES 353 *ENVIRONMENTAL RACISM
 - ES 448/PHL 448/REL 448 NATIVE AMERICAN PHILOSOPHIES
 - FES 435/TOX 435 *GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK
 - FES 485 *CONSENSUS AND NATURAL RESOURCES
 - FW 340 *MULTICULTURAL PERSPECTIVES IN NATURAL RESOURCES
 - GEO 309 *ENVIRONMENTAL JUSTICE ¹
 - PHL 325 *SCIENTIFIC REASONING
 - PHL 440 *ENVIRONMENTAL ETHICS
 - PHL 443/REL 443 *WORLD VIEWS AND ENVIRONMENTAL VALUES
 - PS 461 ENVIRONMENTAL POLITICAL THEORY
 - SOC 456 *SCIENCE AND TECHNOLOGY IN SOCIAL CONTEXT
 - SOC 480 ENVIRONMENTAL SOCIOLOGY
 - SOC 481 *SOCIETY AND NATURAL RESOURCES
 - SUS 331 *SUSTAINABILITY, JUSTICE, AND ENGAGEMENT
 - WGSS 440 *WOMEN AND NATURAL RESOURCES
- Select one Human Environment course: 3-4
- AG 301 *ECOSYSTEM SCIENCE OF PACIFIC NW INDIANS
 - BI 301 *HUMAN IMPACTS ON ECOSYSTEMS
 - BI 347 *OCEANS IN PERIL
 - BI 348 *HUMAN ECOLOGY
 - EAH 411 **PERSPECTIVES IN ENVIRONMENTAL ARTS AND HUMANITIES
 - ENSC 479 ^ENVIRONMENTAL CASE STUDIES ¹
 - FW 324 *FOOD FROM THE SEA
 - FW 325 *GLOBAL CRISES IN RESOURCE ECOLOGY
 - FW 470 *ECOLOGY AND HISTORY: LANDSCAPES OF THE COLUMBIA BASIN
 - GEO 308 *GLOBAL CHANGE AND EARTH SCIENCES
 - GEOG 203 *HUMAN-ENVIRONMENT GEOGRAPHY
 - GEOG 300 *SUSTAINABILITY FOR THE COMMON GOOD
 - GEOG 350 *GEOGRAPHY OF NATURAL HAZARDS
 - GEOG 431 GLOBAL RESOURCES AND DEVELOPMENT
 - HST 481 *ENVIRONMENTAL HISTORY OF THE UNITED STATES
 - OC 333 *OCEANS, COASTS, AND PEOPLE

SUS 102	*INTRODUCTION TO ENVIRONMENTAL SCIENCE AND SUSTAINABILITY ¹	
SUS 350	*SUSTAINABLE COMMUNITIES ¹	
WGSS 440	*WOMEN AND NATURAL RESOURCES	
WR 462	*ENVIRONMENTAL WRITING	
Z 349	*BIODIVERSITY: CAUSES, CONSEQUENCES, AND CONSERVATION ¹	
Select one Environmental Management course:		3-4
BOT 413/FOR 413	FOREST PATHOLOGY	
ENT 331/HORT 331	POLLINATORS IN PERIL	
FES 350/HORT 350	URBAN FORESTRY	
FES 355	MANAGEMENT FOR MULTIPLE RESOURCE VALUES	
FES 365	*ISSUES IN NATURAL RESOURCES CONSERVATION ¹	
FES 412	FOREST ENTOMOLOGY	
FES 445/FW 445	ECOLOGICAL RESTORATION	
FOR 346	TOPICS IN WILDLAND FIRE	
FW 251	PRINCIPLES OF FISH AND WILDLIFE CONSERVATION	
FW 323	MANAGEMENT PRINCIPLES OF PACIFIC SALMON IN THE NORTHWEST	
FW 326	INTEGRATED WATERSHED MANAGEMENT	
FW 435	*WILDLIFE IN AGRICULTURAL ECOSYSTEMS	
FW 464	MARINE CONSERVATION BIOLOGY	
GEO 306	*MINERALS, ENERGY, WATER, AND THE ENVIRONMENT	
GEOG 430	RESILIENCE-BASED NATURAL RESOURCE MANAGEMENT	
GEOG 440	WATER RESOURCES MANAGEMENT IN THE UNITED STATES	
GEOG 441	INTERNATIONAL WATER RESOURCES MANAGEMENT	
GEOG 452	SUSTAINABLE SITE PLANNING	
NR 455	NATURAL RESOURCE DECISION MAKING ¹	
RNG 341	RANGELAND ECOLOGY AND MANAGEMENT ¹	
RNG 355	DESERT WATERSHED MANAGEMENT ¹	
RNG 421	WILDLAND RESTORATION AND ECOLOGY	
RNG 455	RIPARIAN ECOHYDROLOGY AND MANAGEMENT ¹	
RNG 490	RANGELAND MANAGEMENT PLANNING	
TRAL 352	WILDERNESS MANAGEMENT	
Experiential Learning ³		
Select 3 credits from the following:		3
ENSC 401	RESEARCH AND SCHOLARSHIP	
ENSC 403	THESIS	
ENSC 410	ENVIRONMENTAL SCIENCE INTERNSHIP	
Alternative Approved Courses:		
BI 371	*ECOLOGICAL METHODS	
BI 373	*FIELD METHODS IN MARINE ECOLOGY	
BI 375	FIELD METHODS IN ECOLOGICAL RESTORATION	
BOT 341	PLANT ECOLOGY	
BOT 440	FIELD METHODS IN PLANT ECOLOGY	
RNG 441	RANGELAND ANALYSIS	
SOIL 466	SOIL MORPHOLOGY AND CLASSIFICATION	
Specialization Area ⁴		27
Total credits required for graduation		180

Specialization Area Approved Certificate:

- Geographic Information Science (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/geographic-information-science-certificate/>)²
- Scientific, Technical, and Professional Communication Certificate (<https://catalog.oregonstate.edu/college-departments/liberal-arts/school-arts-communication/scientific-technical-professional-communication-certificate/>)

Approved Options (All options under the Environmental Sciences major):

- Alternative Energy (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/alternative-energy-option/>)
- Applied Ecology (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/applied-ecology-option/>)^{1,2}
- Aquatic Biology (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/aquatic-biology-option/>)²
- Chemistry and the Environment (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/chemistry-environment-option/>)
- Conservation, Resources, and Sustainability (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/conservation-resources-sustainability-option/>)^{1,2}
- Earth Systems (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/earth-systems-option/>)²
- Environmental Agriculture (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-agriculture-option/>)²
- Environmental Policy and Economics (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-policy-economics-option/>)²
- Environmental Science Education (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-science-education-option/>)
- Environmental Water Resources (<http://catalog.oregonstate.edu/college-departments/earth-ocean-atmospheric-sciences/environmental-sciences-bs-hbs/environmental-water-resources-option/>)²

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

¹ Available at OSU-Cascades

² Available via Ecampus

³ The program must contain at least one internship, research, or study abroad experience that provides opportunities for hands-on experience in design and collection of observations in the physical, biological or social environment. Students are urged to work with advisors at an early stage in their study to identify experiences that are appropriate, or discuss alternative approved experiential courses

⁴ This requirement can be met by completing an approved certificate, option, or minor from a participating program in the environmental or closely related sciences, or working with advisors to develop an innovative course cluster to analyze environmental systems

Major Code: 657

First Year		
Fall		Credits
WR 121	*ENGLISH COMPOSITION	3
MTH 112	*ELEMENTARY FUNCTIONS	4
CH 121	GENERAL CHEMISTRY	5
ENSC 101	ENVIRONMENTAL SCIENCES ORIENTATION	1

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HHS 231	*LIFETIME FITNESS FOR HEALTH	2
Credits		15
Winter		
COMM 218	*INTERPERSONAL COMMUNICATION	3
MTH 251	*DIFFERENTIAL CALCULUS	4
CH 122	*GENERAL CHEMISTRY	5
Bacc Core - Literature & Arts		3
Credits		15
Spring		
HHS 241	*LIFETIME FITNESS (or a PAC course)	1
MTH 252	INTEGRAL CALCULUS	4
CH 123	*GENERAL CHEMISTRY	5
Bacc Core - Western Culture		3
Bacc Core - Difference, Power and Discrimination		3
Credits		16
Second Year		
Fall		
BI 221	*PRINCIPLES OF BIOLOGY: CELLS	4
ECON 201	*INTRODUCTION TO MICROECONOMICS	4
ATS 201	*CLIMATE SCIENCE	4
General Elective		3
Credits		15
Winter		
BI 222	*PRINCIPLES OF BIOLOGY: ORGANISMS	4
OC 201	*OCEANOGRAPHY	4
Bacc Core - Cultural Diversity		4
Bacc Core - Writing II		3
Credits		15
Spring		
BI 223	*PRINCIPLES OF BIOLOGY: POPULATIONS	4
PHL 443	*WORLD VIEWS AND ENVIRONMENTAL VALUES	3
GEO 221	*ENVIRONMENTAL GEOLOGY	4
General Elective		4
Credits		15
Third Year		
Fall		
PH 201	*GENERAL PHYSICS	5
BI 370	ECOLOGY	3
Upper Division Specialization		3
General Elective		4
Credits		15
Winter		
PH 202	*GENERAL PHYSICS	5
Upper Division Specialization		4
General Elective		4
General Elective		3
Credits		16
Spring		
GEO 306	*MINERALS, ENERGY, WATER, AND THE ENVIRONMENT	3
ST 351	INTRODUCTION TO STATISTICAL METHODS	4
Upper Division Specialization		4
General Elective		4
Credits		15
Fourth Year		
Fall		
ST 352	INTRODUCTION TO STATISTICAL METHODS	4
ENSC 479	*ENVIRONMENTAL CASE STUDIES	3
Upper Division Specialization		3
General Elective		4
Credits		14

Winter		
Upper Division Specialization		3
General Elective		3
Upper Division Specialization		4
General Elective		4
Credits		14
Spring		
ENSC 410	ENVIRONMENTAL SCIENCE INTERNSHIP	3
Upper Division Specialization		3
Upper Division Specialization		3
Upper Division Specialization		3
General Elective		3
Credits		15
Total Credits		180