2023-2024 Bachelor of Science Environmental Sciences (ENSC) Curriculum Checklist

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 Graduation requirements
2. Baccalaureate Core
3. Major Curriculum
    - Science and math
    - Environmental sciences and humanities core
    - Experiential Learning
    - Specialization Option
        - Applied Ecology or
        - Conservation, Resources and Sustainability

Degree Learning Outcomes

Students will…

- Identify and define concepts in the natural sciences
- 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 the 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.

OSU Graduation Requirements:

Students pursuing a degree at OSU must meet the following requirements in addition to Bacc Core and major requirements.

_____ 180—total number of credits required to graduate from OSU
_____ 60—number of upper division credits required
_____ 45 of last 75 credits must be OSU credits
_____ 2.0 Cumulative OSU

Checklist only lists OSU-Cascades Courses

A. OSU Baccalaureate Core: Total 48 credits plus WIC course. No Single course may be used to satisfy more than one area of Bacc Core, except WIC. https://catalog.oregonstate.edu/earning-degrees/bcc/

Bacc Core area	Course	Fulfilled	Grade
Skills Requirements: (15 Credits)			
Lifetime Fitness	HHS 231		
Lifetime Fitness Lab or PAC course	PAC 1xx		
Mathematics	Fulfilled by Major		
Writing I	WR 121Z		
Writing II			
Speech			
Perspective Requirements: (24 Credits)- ***No more than two courses from any one subject may be used.***			
Cultural Diversity			
Literature & the Arts			
Social Processes & Institutions (SPI)	ECON 201 in major (if selected for ENV. Econ & Policy)		
Western Culture			
Physical Science	Fulfilled by Major		
Biological Science	Fulfilled by Major		
Additional Science (Physical or Biological)	Fulfilled by Major		
Difference, Power & Discrimination (DPD)	GEOG 333 in major (if selected for Env. Ethics)		
Synthesis Requirements: (6 credits)- ***These two courses cannot be from the same department***			
Contemporary Global Issues (CGI)	Multiple courses double count in major		
Science, Technology & Society (STS)	GEOG 340 in major		
WIC Course: (3-4 credits)			
Writing Intensive Course in Major (WIC)	ENSC 321 in Major		

ENSC Major Requirements: Courses taken in sections B and C can double count in Bacc Core requirements. Students cannot S/U major requirements. A grade of C- or better is required in all upper division (300-400) level courses, and some Basic Science and Math Core courses.

B. Basic Science and Math Requirements (51-53 credits/12 courses)

1.MATH	Pre-reqs and Guidance	Term offered- (Subject to change)	Grade
MTH 251(4) Differential Calculus	MTH 112Z or ALEKs 75 score	F, W, SU	
MTH 252 (4) Integral Calculus	MTH 251	W, S, SU	
2. Chemistry			
CH 121 or CH 231/261* (5) General Chemistry	MTH 111Z or Higher, or ALEKs 60 score	F	
CH 122 or CH 232/262* (5) General Chemistry	CH 121 or CH 231/261	W	
CH 123 or CH 233/263 (5) General Chemistry	CH 122 or CH 232 /262	S	
3.BIOLOGY SEQUENCE			
BI 221 (4) Principles of Biology	CH 121 or CH 231/261 (or concurrent reg)	F, SU	
BI 222 (4) Principles of Biology	BI 221	W, SU	
BI 223 (4) Principles of Biology	BI 221	S, SU	
4.PHYSICS SEQUENCE			
PH 201 (5) Gen. Physics or PH 211 (5) Physics w/Calc	Talk to advisor	F, SU	
PH 202 (5) Gen. Physics or PH 212 (5) Physics w/Calc	Talk to advisor	W, SU	
5.STATISTICS			
ST 351 (4) Intro to Stat. Methods		F, SU	
ST 352 (4) Intro to Stat. Methods	ST 351	W, SU	

C. Environmental Sciences and Humanities Core: Courses taken in this section can double count with Bacc Core requirements. No double counting between Sections C and D. A grade of C- or better required in all upper division classes.

Environmental Sciences and Humanities Core	Pre-req/ Notes	Term offered- (Subject to change)	Grade
ENSC 101 – Environmental Sciences Orientation		F	
ENSC 321- Environmental Case Studies ^ WIC		W	
Natural Environmental Systems	**Pre-reqs and Guidance**	**Term offered- (Subject to change)**	**Grade**
ATS 201 (4) Climate Science *Atmosphere*		S	
BI 370 (3) Ecology *Biosphere*	Pre-req (BI 221-223 or BI 211-213) BI 370 must be taken for Option Prep	W	
GEO 221 (4) Environmental Geology *Geosphere*		F	
GEOG 340 (3) Intro H_2o Sci & Policy *STS *Hydrosphere*		F	

Humans and the Environment (15-20 credits) – Choose one Course for each requirement			
Economics and Policy– Choose one course from below	Pre-reqs and Guidance	Term offered- (Subject to change)	Grade
ECON 201 (4) Intro to Microeconomics *SPI or PS 475 (4) Environmental Politics		F, W S	
Env. Ethics – Choose one course from below			
FES 485 (3) Consensus and Natural Resources *STS or GEOG 333 (3) Environmental Justice *DPD or SOC 480 (4) Environmental Sociology *CGI		S S W	
Human Environment – Choose one course from below			
SUS 102 (4) Intro to Env. Science & Sustainability or SUS 350 (4) Sustainable Communities *CGI or Z 349 (3) Biodiversity: Causes, Conseq. Conserv. *CGI		F F S	
Environmental Mgmt. – Choose one course from below			
FES 365 (3) Issues in Natural Resources Conservation *CGI or FES 445 (4) Ecological Restoration or FW 251 (3) Principles Fish & Wildlife Conservation or FW 323 (3) Mgmt Principles of Pacific Salmon or FW 326 (3) Integrated Watershed Mgmt or NR 455 (4) Natural Resource Decision Making or RNG 341 (3) Rangeland Ecology and Mgmt or RNG 455 (4) Riparian Ecohydrology & Mgmt	Recommended pre-req BI 370 (3) Ecology Pre-reqs FES 485 & major WIC Pre-req BI 221-223 Recommended pre-req FW 326	W S F W S W W F	

D. Specialization -A minimum of 27 credits is required.

Courses taken in the Specialization Area can double count with Bacc Core requirements. Courses taken in the Specialization Area cannot double count with Basic Science and Math Courses or Environmental Sciences and ENSC and Humanities Core. OSU-Cascades offers the Applied Ecology and Conservation, Resources, and Sustainability option. Contact your advisor to declare a specialization. Pages 4-5 list option classes and requirements.

E. Experiential Learning (3 credits required):

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.

- ☐ ENSC 401 Research
- ☐ ENSC 410 Internship
- ☐ Programs (Study Abroad, IE3 Global Internships, etc.)Coursework- Courses that provide hands-on-training in lab or field research. These courses can double count in Bacc core and ENSC sciences. Consult with your advisor for alternative approved courses. Examples: BI 371, and BI 375

D. Specialization Area/Option

OSU-Cascades offers 2 specialization areas: Applied Ecology and Conservation Resources and Sustainability.
Students must select an option to complete the program/major requirements.

- Classes used to fulfill requirements in the specialization cannot double count with ENSC Core.
- All courses must be taken for a letter grade, no S/U grades.
- Students must earn at least a C- in upper division (300 or higher) major/option courses.

Applied Ecology Option Overview (27 credits minimum)

Taking root as a field of inquiry independent from biology, geography, and other related disciplines in the 1960s, Environmental Sciences developed with ecology at its base. This science-based option takes an applied ecology approach and therefore includes field and geographic methods for collecting and measuring data on ecological change at various scales. Students seeking a concentration in policy and management are encouraged to consider the Conservation, Resources, and Sustainability option.

In the Applied Ecology option, students take at least one advanced ecology course, selecting from plant, forest, wetland riparian, and rangeland ecologies. Their choice may lead to taking additional related courses such as in forest ecology. In consultation with their advisor, students will find many possibilities for pursuing their interests in ecology.

Because environmental scientists who focus on ecology usually conduct fieldwork, the curriculum contains a field methods course either in ecology restoration (BI 375) or wildland plant identification (RNG 353). Complementing the field methods requirement, students take at least one geographic methods course. Various types of ecological data can be analyzed and presented for policy making from local to global scales using geographic information systems (GIScience) and remote sensing.

Applied Ecology Core: 10-20 Total Credits 3 Courses Required Grade		Term Offered (subject to Change)	
1. Ecological Studies- Select 1 minimum FES 341 (3) Forest Ecology or RNG 341 (3) Rangeland Ecology & Mgmt	 Pre-req BI 221-223 Pre-req BI 221-223	 F W	
2. Field Methods – Select 1 minimum RNG 353 Wildland Plant Identification (4) or BI 371 Ecological Methods (3) or BI 375 Field Methods in Ecology Restoration (4)	 Pre-req. BI 221-223 Pre-req. BI 221-223	 F S SU	
3. Geographic Methods GEOG 360 (4) GIS Systems & Theory		W	

Specialty Option Additional Electives *select 9-17cr to complete 27 total credits in option from below or above courses.*	Pre-reqs and Guidance	Term Offered (subject to change)	Grade
FES 342 (3) Forest Types of the Northwest		F	
FES 440 (3) Wildland Fire Ecology		S	
FES 445/FW 445 (4) Ecological Restoration	Recommended pre-req BI 370	S	
FW 311 (3) Ornithology	Recommended pre-req, 1 year BIO	S (EOY)	
FW 312 (3) Systematics of Birds	Recommended pre-req, 1 year BIO	W (EOY)	
FW 317 (3) Mammalogy	Recommended pre-req, 1 year BIO	S (EOY)	
FW 318 (2) Systematics of Mammals	Recommended Pre-req 1 year BIO	W (EOY)	
FW 320 (4) Population Dynamics	Pre-req BI 370	S (EOY)	
FW 481 (3) Wildlife Ecology	Pre-req BI 370	S (EOY)	
RNG 455 Riparian Ecohydrology and Mgmt (4)	Recommended pre-req FW 326	F	
Z 477 Aquatic Entomology (4)	Pre-req BI 221-223	F	

Conservation, Resources and Sustainability Overview (27 credits minimum)

This option provides Environmental Sciences students the opportunity to explore the many course offerings at OSU in the areas of conservation, resource management, and sustainability. The option features broad course choices and flexibility in response to diverse student interests and changing environmental science applications. Courses with more of an ecology focus can be found in the Applied Ecology option.

While broad, this option provides a curricular pathway for students to think in terms of conservation approaches, resource management, and sustainability as science and policy; the curriculum satisfies student goals that may be both personal endeavors and professional. The option has three categories, requiring students to have some background in conservation and resource management, as well as social aspects and related values. With advising and course selection, students can select related courses to pursue areas of personal interest, e.g. rangeland, forests, or mammals.

Students studying in this option can look toward jobs or continued study in the related areas of conservation, resources, and sustainability. For jobs, federal and state agencies—US Forest Service, National Park Service, Bureau of Land Management, Fish and Wildlife, and state parks—plus non-profits (e.g. land and river conservancies), and consultancies, offer a range of possibilities for students completing this option.

Conservation – **Select 3 (or more)**	Pre-reqs and Guidance	Term offered (subject to change)	Grade
BI 375 Field Methods in Ecological Restoration (4)	Pre-req BI 221-223	SU	
FES/FW 445 Ecological Restoration (4)	Recommended BI 370	S	
FW 320 Introductory Population Dynamics (4)	Pre-req BI 370 (3) Ecology	S (EOY)	
FW 326 Integrated Watershed Management (3)		S	
FW 370 Conservation Genetics (4)		W	
Z 349 Biodiversity: Causes, Conseq.,Conservation (3)		S	
Resource Management and Policy – **select 3 (or more)**			
AEC 352 (3)Environmental Economics and Policy *CGI	Pre-req ECON 201 (4) Microeconomics	W	
FW 323 (3) Mgmt Principles Pacific Salmon of NW		W	
GEOG 360 (4) GISCIENCE I		W	
PS 475 (4) Environmental Politics and Policy		S	
RNG 341 (3) Rangeland Ecology & Mgmt	Pre-req BI 221-223	W	
SUS 304 (4) Sustainable Assessment *STS		W	
Society and Values – **select 1 (or more)**			
FES 485 (3) Consensus and Natural Resources *STS	Pre-req FES 485 and (BI 371 or ENSC 479)	S	
GEOG 333 (3) Environmental Justice *DPD		S	
NR 455 (4) Natural Resources Decision Making		W	
SOC 480 (4) Environmental Sociology *CGI		W	
SUS 304 (4) Sustainability Assessment*STS		W	
SUS 350 (4) Sustainable Communities *CGI		F	
SUS 420 (3) Social Dimensions of Sustainability		W	
Additional Electives from above to complete 27 total			

Bacc Core Key Guide

DPD- Difference, Power, and Discrimination

CGI- Contemporary Global Issues

STS- Science, Tech, and Society

WIC- Writing Intensive Course