

Biology Major— Ecology Option 2018-2019

The Ecology option coursework covers the Biology and Society, Organismal Biology, Physiology, Writing Intensive course (WIC) and upper division science electives for the Biology major. Other coursework taken abroad or at Hatfield may be approved by Brock McLeod. It is recommended that Ecology option students complete ST 351, 411 and 412 (instead of ST 351, 352) for the major. Previous versions of this option are different and are tracked in MyDegrees. **All courses and prerequisites are subject to change.**

Plant Organismal Biology (select one course from the following)			
Course	Pre(Co)requisites	Term	Credits
BOT 321: Plant Systematics	BI 211, 212, 213 (C-)	SP	4
BOT 416: Aquatic Botany	BI 211, 212, 213 (C-)	F	4
RNG 353: Wildland Plant Identification	BI 211, 212, 213 (C-)	?	4
Animal Organismal Biology (select one course from the following)			
Z 361: Invertebrate Biology AND Z 362: Invertebrate Biology Lab	BI 211, 212, 213 (C-)	SP	(3+2)
Z 371: Vertebrate Biology AND Z 372: Vertebrate Biology Lab	BI 211, 212, 213 (C-)	F	(3+2)
Z 477: Aquatic Entomology	BI 211, 212, 213 (C-)	W	4
Methods and Writing Intensive (WIC) Course (select ONE)			
BI 371: Ecological Methods	BI 370	SP	3
BI 373: Methods in Marine Ecology	BI 351 or BI 370, ST 351 (ST 352 Recommended)	SP	3
Behavior and Physiological Ecology			
Z 350: Animal Behavior AND	BI 211, 212, 213 (C-)	W	3
Z 423: Environmental Physiology OR BOT 488: Environmental Physiology of Plants		F W	3 3
Population Ecology (select one course from the following)			
BI 483: Population Biology	MTH 251, ST 351, ST 352, BI 370 or BI 311	W	3
BOT 442: Plant Population Ecology	BI 370 or BOT 341	?	3
FW 320: Introduction to Population Dynamics	MTH 251 or MTH 227, ST 351	W	4
Community and Ecosystem Ecology (select one course from the following)			
BI 306: Environmental Ecology		?	3
BI 351: Marine Ecology	BI 211, 212, 213 (C-)	W	3
BI 353: Pacific Northwest Coastal Ecosystems	BI 211, 212, 213 (C-); taught at hatfield	SU	3
BI 481: Biogeography	BI 370	Alternate W	3
FES 341: Forest Ecology	BI 211, 212, 213 (C-)	F	3
FW 321: Applied Community and Ecosystem Ecology	FW 320	SP	3
FW 456: Limnology	Senior Standing	SP	5
FW 479: Wetlands and Riparian Ecology	BI 370	SP?	3
GEO 484: Introduction to Biogeochemistry	MTH 111; CH 232/262	?	3
OC/FW 434: Estuarine Ecology	OC 201	F	4
Conservation and Human Impacts (select one course from the following)			
BI 301: Human Impacts on Ecosystems	No 1st year; BI 211, 212, 213 or CH 233/263	W	3
BI 348: Human Ecology	No 1st year	?	3
Z 349: Biodiversity: Causes, Consequences, and Conservation	No 1st year	F, W	3
Environmental Policy (select one course from the following)			
AEC 250: Introduction to Environmental Economics and Policy	MTH 111 or equivalent	W, SP, SU	3
AEC 253: Environmental Law, Policy, and Economics		W	4
AEC 351: Natural Resource Economics and Policy	AREC 250 or ECON 201; MTH 111	W, SP	3
AEC/ECON 352: Environmental Economics and Policy	AREC 250 or ECON 201	F, SP	3
FES/TOX 435: Genes and Chemicals in Agriculture: Value and Risk	BI 211, 212, 213; CH 233/263	SP	3
FES 485: Consensus and Natural Resources		?	3
FOR 462: Natural Resource Policy and Law		F	3
FW 350: Endangered Species, Society and Sustainability	FW 251	?	3
FW 415: Fisheries and Wildlife Law and Policy	PS 201 or other PS courses recommended	?	3
PS 475: Environmental Politics and Policy	PS 201 or instructor approval required	F	4

Electives List (select two courses from Track I OR one course and 3 experiential learning credits from Track II)			
BI 353: Pacific Northwest Coastal Ecosystems	BI 211, 212, 213 (C-), *taught at Hatfield	SU	3
BI 385: Symbiosis and the Environment	BI 211, 212, 213 (C-) and CH 123 or CH 233/263	Alternate W	3
BI 375: Field Methods in Ecological Restoration	BI 211, 212, 213 (C-), taught at Cascades	SU	5
BI 427: Paleobiology	one year of biology	SP	3
BI 481: Biogeography (if not taken above)	instructor approval required	Alternate W	3
BI 483: Population Biology (if not taken above)	MTH 251, ST 351, ST 352, BI 370 or BI 311	W	3
BI 495: Disease Ecology	BI 370	Alternate W	3
BOT 341: Plant Ecology	BI 211, 212, and 213 or BOT 321	SP	4
CH 390: Environmental Chemistry	CH 331	W, SP	3
ENT 420: Insect Ecology	BI 370	W	3
FES 440: Wildland Fire Ecology	BI 370, junior standing	W	3
FES/FW 452: Biodiversity Conservation in Managed Forests OR FW 458: Mammal Conservation OR HORT 318: Applied Ecology of Managed Ecosystems	BI 370	S SP W	3 4 3
FW 421: Aquatic Biological Invasions	One year of biology	SU	4
FW 445: Ecological Restoration	BI 370	SP	4
FW 462: Ecosystems Services	BI 370 or equivalent coursework	SP	3
MB 448: Microbial Ecology	MB 302	W	3
ST 435: Quantitative Ecology	ST 412/512	?	3
Track II: Experiential Learning Credits (complete any combination of three credits if taking only one course above)			
BI 401: Research and Scholarship	Departmental Approval	All Terms	1-3
BI 406: Projects: Curatorial Assistant	Departmental Approval	All Terms	1-3
BI 410: Internship	Departmental Approval	All Terms	1-3

Ecology Careers

Ecology is the study of the physical and biological factors that affect the distribution and abundance of organisms, and ecological knowledge is foundational to fields such as conservation biology, environmental sciences and others. Most ecologists address questions on a wide variety of spatial and temporal scales over their career, and individuals most often work on a variety of organisms. Broad training is considered advantageous. Completion of the Biology major and the coursework in the Ecology option provides a solid foundation for a career in ecology and other biological fields. Entry-level technician positions in ecology are found in settings such as agencies, non-governmental organizations, environmental consulting companies and academia. Graduate work in ecology can be an important consideration as it increases both salary and leadership opportunities. All students interested in ecology should plan on professional experience before graduation. Further information about ecology careers can be found at:

<https://www.esa.org/esa/careers-and-certification/>
<http://www.conservationjobboard.com/Category/ecology-jobs>

Ecological Skills and Tools

Most ecologists have a significant component of field work in their positions, though it is rarely year-round. Many jobs will require some outdoor experience. The OSU Adventure Leadership Institute offers programming and a certificate related to leadership development and practical skills such as orienteering, wilderness first aid and others. See <http://recsports.oregonstate.edu/ali/what-is-ali>.

Statistical knowledge can be particularly important in ecology. It is recommended that Ecology option students complete the ST 351, 411 and 412 series instead of ST 351 and 352.

Global Information Systems (GIS) is a useful tool for ecologists, particularly those interested in landscape ecology. OSU offers a 27-credit GIScience certificate <http://ceoas.oregonstate.edu/giscience/>.

Chemistry knowledge is desirable in ecology, particularly ecosystem ecology. Completion of the chemistry minor requires one additional course, typically CH 390 Environmental Chemistry.

Professional Experience

- Students interested in research should look up faculty research on unit websites and contact them directly about volunteering - most student positions are unpaid. More information and a list of units with ecology faculty at <http://ib.oregonstate.edu/professional/research-internships>.
- For off-campus opportunities, see the ecology list at <http://ib.oregonstate.edu/professional/internship-research/intern-volunteer-list>.
- The NSF REU (Research Experiences for Undergraduates) program is an excellent and nationally competitive program with many ecology sites. <http://www.nsf.gov/home/>

International Opportunities

Many international programs in ecology are available. Study abroad and internships can be integrated in to a four-year degree with the Ecology option and include diverse group choices. See <http://ib.oregonstate.edu/ugfiles/studyabroad.pdf>.