

Biology Major - Ecology Option Guide 2023-24

Document available online at <https://ib.oregonstate.edu/undergraduate/advising/college-advising-guide>.

The Ecology option is designed to give students a strong background in ecological methods and theory. It helps prepare for graduate programs in ecology, as well as a variety of ecological and conservation careers. Courses used to satisfy the ecology option also count for Biology and Society, Writing Intensive, Organismal Biology, Physiology and Experiential Learning or Integrative Biology Elective requirements for the biology major. Ecology option students should consider completing ST 351, 411 and 412 for the major. **Previous versions of this option are different and are tracked in MyDegrees. All courses and prerequisites are subject to change, and the listing of the term is based on projected Corvallis campus offerings.**

Plant Organismal Biology (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BOT 321	Plant Systematics (4cr)	Sp	BI 221, 222, 223 (C-)	-
BOT 416	Aquatic Botany (4cr)	F	BI 221, 222, 223 (C-)	-
RNG 353	Wildland Plant Identification (4cr)	Sp	BI 221, 222, 223 (C-)	-

Animal Organismal Biology (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
Z 361 & Z 362	Invertebrate Biology AND Lab (3cr+2cr)	SP	BI 221, 222, 223 (C-)	-
Z 371 & Z 372	Vertebrate Biology AND Lab (3cr+2cr)	F	BI 221, 222, 223 (C-)	-
Z 461	Marine and Estuarine Invertebrate Zoology (4cr)	Su*	BI 221, 222, 223 (C-)	*Hatfield only
Z 477	Aquatic Entomology (4cr)	W	BI 221, 222, 223 (C-)	-

Methods and Writing Intensive (WIC) (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BI 371	Ecological Methods (3cr)	Sp	BI 370	-
BI 373	Methods in Marine Ecology (3cr)	Sp	(BI 351 or BI 370) & ST 351	-

Behavior and Physiological Ecology

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
Z 350 AND	Animal Behavior (3cr)	W, Sp	BI 221, 222, 223 (C-)	-
Z 423 OR BOT 488	Environmental Physiology (3cr) OR Environmental Physiology of Plants (3cr)	F W	BI 221, 222, 223 (C-) & CH 233/263 (C-) BI 370	-

Population Ecology (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BI 483	Population Biology (3cr)	W	MTH 251, ST 352 & (BI 370 or BI 311)	-
FW 320	Introduction to Population Dynamics (4cr)	W	(MTH 251 or MTH 227) & ST 351	-

Community and Ecosystem Ecology (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BI 306H	Environmental Ecology (3cr)	F*	BI 221, 222, 223 (C-)	*See catalog, Honors College only
BI 351	Marine Ecology (3cr)	W	BI 221, 222, 223 (C-)	-
BI 353	Pacific Northwest Coastal Ecosystems (3cr)	Su*	BI 221, 222, 223 (C-)	*Taught at Hatfield
BI 481	Biogeography (3cr)	W*	BI 370	*Alternate Winters
FES 341	Forest Ecology (3cr)	F, W	BI 221, 222, 223 (C-)	
FW 321	Applied Community and Ecosystem Ecology (3cr)	Sp	FW 320	-
FW 456	Freshwater Ecology and Conservation (5cr)	Sp	Senior standing	-
FW 479	Wetlands and Riparian Ecology (3cr)	All*	BI 370	*Ecampus only
GEO 484	Introduction to Biogeochemistry (3cr)	?*	MTH 111, CH 232/262	*See catalog
OC/FW 434	Estuarine Ecology (4cr)	F	BI 370	

Conservation and Human Impacts (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BI 301	Human Impacts on Ecosystems (3cr)	W	BI 221, 222, 223 or CH 233/263, sophomore+	-
BI 348	Human Ecology (3cr)	Sp*	Sophomore+	*Ecampus only
Z 349	Biodiversity: Causes, Consequences, Conservation (3cr)	F, W	Sophomore+	-

Environmental Policy (select one course from the following)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
AEC 250	Introduction to Environmental Econ. and Policy (3cr)	All*	MTH 111	*Ecampus only
AEC 253	Environmental Law, Policy, and Economics (4cr)	W	-	-
AEC 351	Natural Resource Economics and Policy (3cr)	W	(AREC 250 or ECON 201) & MTH 111	-
AEC/ECON 352	Environmental Economics and Policy (3cr)	F, Sp	AREC 250 or ECON 201	-
FES 485	Consensus and Natural Resources* (3cr)	F, W	-	*Bacc core
FW 350	Endangered Species, Society and Sustainability (3cr)	F	Sophomore+	-

Experiential Learning or Science Elective Course

Select one course from Track II and 3 experiential credits from Track I or two courses from Track II

Track I: Experiential Learning Credits (complete any combination of three credits if taking only one course below)

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BI 309 <u>or</u> BI 409	Teaching Practicum or Advanced Practicum (1-3cr)	F, W, Sp	By department approval*	*See form here
BI 401	Research and Scholarship (1-3cr)	All terms	By department approval*	*See form here
BI 406	Projects: Curatorial Assistant (1-3cr)	All Terms	By department approval*	*See form here
BI 410	Internship (1-3cr)	All Terms	By department approval*	*See form here

Track II: Ecology Elective Course

Course	Description (Credits)	Term(s)	Pre-requisites	Comments
BI 353	Pacific Northwest Coastal Ecosystems (3cr)	Su*	BI 221, 222, 223 (C-)	If not taken above. *Hatfield only
BI 358	Symbiosis and Environment (3cr)	W*	BI 221, 222, 223 (C-) & CH 233/263	*Alternate even years
BI 375	Field Methods in Ecological Restoration (5cr)	Su*	BI 221, 222, 223 (C-)	*Cascades only
BI 427	Paleobiology (3cr)	Sp	BI 221, 222, 223 (C-)	-
BI 481	Biogeography (if not taken above) (3cr)	W*	BI 370	*Alternate odd years
BI 485	Monster Biology (3cr)	W	BI 370* and BI 311*	*May be concurrent
BI 495	Disease Ecology (3cr)	W*	BI 370	*Alternate even years
BOT 341	Plant Ecology (4cr)	Sp	BI 221, 222, 223 (C-) or BOT 321	-
BOT 445	Advanced Plant Ecology (3cr)	F	BI 370 (C)	-
FES 440	Wildland Fire Ecology (3cr)	W	BI 370, Junior+	-
FES/FW 452 <u>OR</u> FW 458	Biodiversity Conservation in Manag. Forests (3cr) Mammal Conservation (4cr)	W Sp	BI 370 BI 370	- -
FES/FW 445	Ecological Restoration (4cr)	SP	BI 370	-
FW 462	Ecosystem Services (3cr)	W*, Sp*	BI 370	*Ecampus only
GEOG 452	Environmental Assessment (3cr)	Sp	-	-
SOIL 455	Biology of Soil Ecosystems (4 cr)	W	BI 221, 222, 223 (C-)*	*SOIL or CSS intro courses recommended
MB 448	Microbial Ecology (3cr)	W	MB 302	-

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 with a variety of organisms and spatial and temporal scales over their career. Broad training is advantageous. 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. Students interested in ecology should plan on professional experience before graduation. Further information can be found [ESA Career Development](#) and [Conservation Job Board for Ecology](#)

Ecological Skills and Tools

- **Field Work:** Most ecologists have a significant component of field work in their positions, though rarely year-round. Many jobs require outdoor experience. OSU [Adventure Leadership Institute](#) offers programming and a certificate related to leadership development and practical skills such as orienteering, wilderness first aid and others.
- **Statistics:** 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 particularly useful in landscape ecology. You can take GIS coursework in the quantitative applications elective of the computer science track in your major. If you want more GIS experience, OSU offers a 27- credit [GIScience certificate](#).
- **Chemistry:** is particularly important for ecosystem ecology. The [chemistry minor](#) requires one additional course, typically CH 390.

Professional Experience

- **Research:** Students interested in research should look up faculty research on unit websites and contact them directly about volunteering as most student positions are unpaid. [Information on getting research experience](#).
- **Internships:** For off-campus opportunities, see [Ecology Internship and Volunteering](#).
- **NSF REU (Research Experiences for Undergraduates):** an excellent and nationally competitive program with many ecology sites. [NSF REUs](#)
- **International Opportunities:** Many international programs in ecology are available. Study abroad and internships can be integrated in a four-year degree with the Ecology option. See the [Abroad in Biology and Zoology page](#) for ideas and next steps.