

Ecology and Conservation Biology

Have Questions About the Biology Major?
Visit Student Services in 103 Bessey Hall
or call 515-294-1064

Specializing your Biology degree at Iowa State University

Ecologists study the interactions and relationships that living organisms have with each other and their environment. They develop expertise in understanding the composition, distribution, and dynamic processes of the world's ecosystems and the organisms that live there. Understanding ecology strongly complements conservation biology, or the study of our planet's biodiversity for the sake of protecting species, habitats, and ecosystems. Ecologists and conservationists learn about behavior, biodiversity (from botany to zoology), climate, genetics, evolution, nutrient cycles, natural resources, and more. Careers in this specialization are often with non-profit environmental groups or governmental agencies aiming to protect and serve the environment and our planet's biodiversity.

Students interested in this specialization should prioritize completing BIOL 312 and BIOL 315 within the biology core curriculum. For advanced biology coursework, take at least nine credits from the lists below, ideally spread across the three topical areas presented below. Participating in experiential learning, such as an independent study course (BIOL 490), related internship experience (BIOL 494), and especially lab/field research (BIOL 499) is also advised. Many students specializing in this area pursue further education with a Masters or Ph.D.

Suggested Advanced Biology Courses for Ecology/Conservation Students

<u>Ecological Processes</u>			<u>Conservation and Restoration</u>		
Course #	Course Name	Credits	Course #	Course Name	Credits
A ECL 415	Ecol of Freshwater Invt/Plnt/Alg	3	AGRON 317	Principles of Weed Science	3
A ECL 418	Stream Ecology	3	AGRON 354	Soils and Plant Growth	3
BIOL 371	Ecological Methods	3	AGRON 354L	Soils and Plant Growth Lab	1
BIOL 381	Environmental Systems I	3	BIOL 462	Evolutionary Genetics	3
BIOL 382	Environmental Systems II	3	BIOL 471	Intro Conservation Biology	3
BIOL 472	Community Ecology	3	EEOB 531	Conservation Biology	3
BIOL 474	Plant Ecology	3	EEOB 535	Restoration Ecology	3
BIOL 476	Functional Ecology	3	FOR 302	Silviculture	3
BIOL 484	Ecosystem Ecology	3	HORT 322	Plant Propagation	3
BIOL 486	Aquatic Ecology	3	NREM 345	Nat.Res. Photogrammetry & GIS	3
BIOL 486L	Aquatic Ecology Lab	1	NREM 390	Fire Ecology and Management	3
BIOL 487	Microbial Ecology	3	NREM 407	Watershed Management	4
BIOL 489	Population Ecology	3	NREM 446	GPS & GIS for Nat.Res. Manag.	3
EEOB 564	Wetland Ecology	3	NREM 452	Ecosystem Management	3
EEOB 569	Biogeography	3	NREM 565	Landscape Change & Conserv.	3
EEOB 570	Landscape Ecology	3	PL P 416	Forest Insects & Diseases	3
EEOB 576	Functional Ecology	3	PL P 416L	Forest Insects & Diseases Lab	1
EEOB 577	Concepts in Ecology & Evolution	1	PL P 494	Seed Pathology	2
ENT 471	Insect Ecology	3			
NREM 301	Natural Resource Ecol & Soils	4			

Organismal Biology & Biodiversity (part 1)

Course #	Course Name	Credits
A ECL 321	Fish Biology	3
A ECL 366	Nat. History of Iowa Vertebrates	3
ANTHR 438	Primate Evol. Ecol & Behavior	3
BIOL 336	Ecol. & Evol. Animal Physiology	3
BIOL 351	Comparative Chordate Anatomy	5
BIOL 354	Animal Behavior	3
BIOL 354L	Animal Behavior Lab	1
BIOL 355	Plants and People	3
BIOL 356	Dendrology	4
BIOL 357X	Biology of Plants	3
BIOL 364	Invertebrate Biology	3-4
BIOL 365	Vertebrate Biology	4
BIOL 366	Plant Systematics	4
BIOL 430	Principles of Plant Physiology	3
BIOL 439	Environmental Physiology	3-4
BIOL 451	Plant Evolution & Phylogeny	4
BIOL 454	Plant Anatomy	4

Organismal Biology & Biodiversity (part 2)

Course #	Course Name	Credits
BIOL 455	Bryophyte and Lichen Biodiv.	3
BIOL 456	Principles of Mycology	3
BIOL 457	Herpetology	2
BIOL 457L	Herpetology Lab	1
BIOL 458	Ornithology	2
BIOL 458L	Ornithology Lab	1
BIOL 459	Mammalogy	2
BIOL 459L	Mammalogy Lab	1
BIOL 462	Evolutionary Genetics	3
BIOL 488	ID of Aquatic Organisms	1
EEOB 507	Advanced Animal Behavior	3
ENT 370	Insect Biology	3
ENT 425	Aquatic Insects	3
HORT 330	Herbaceous Ornamental Plants	3
HORT 341	Woody Plant Cultivars	2
NREM 357	Midwestern Prairie Plants	1
NREM 358	Forest Herbaceous Layer	1

Suggested Supporting Science Courses

For most students interested in ecology and conservation, taking the minimum course sequences for supporting science requirements (CHEM 163 + CHEM 163L, CHEM 231 + CHEM 231L, BBMB 316, PHYS 115 + PHYS 115L) is sufficient. More extensive coursework in chemistry will be useful for ecologists and conservationists wishing to focus on abiotic aspects of the environment. Both introductory statistics (STAT 104 or STAT 101) and intermediate statistics (STAT 301) are recommended; calculus is not typically used in this specialization. Those planning to work in the field are encouraged to take a course in GPS and GIS, as these tools are often used in field work.

Resources for Ecology/Conservation Students

Ecological Society of America: <http://www.esa.org/esa/>

International Association for Society and Natural Resources: <http://www.iasnr.org>

Society for Conservation Biology: <http://conbio.org>

Society for Ecological Restoration: <http://www.ser.org>

The Wildlife Society: <http://wildlife.org>

GRE Information: <http://www.ets.org/gre/>

Be sure to check for student organizations too at: <https://www.stuorg.iastate.edu>