# Ecology and Conservation

Specializing your Biology degree at Iowa State University

Have Questions About the Biology Major?
Contact us at 515-294-1064 or biology@iastate.edu
Or visit Student Services in 103 Bessey Hall

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

### Ecological Processes

| Course # | Course Name | Credits |
|---|---|---|
| A ECL 415 | Ecol of Freshwater Invt/Plnt/Alg | 3 |
| A ECL 418 | Stream Ecology | 3 |
| BIOL 371 | Ecological Methods | 3 |
| BIOL 381 | Environmental Systems I | 3 |
| BIOL 382 | Environmental Systems II | 3 |
| BIOL 472 | Community Ecology | 3 |
| BIOL 474 | Plant Ecology | 3 |
| BIOL 476 | Functional Ecology | 3 |
| BIOL 483 | Environmental Biogeochemistry | 3 |
| BIOL 484 | Ecosystem Ecology | 3 |
| BIOL 486 | Aquatic Ecology | 3 |
| BIOL 486L | Aquatic Ecology Lab | 1 |
| BIOL 487 | Microbial Ecology | 3 |
| BIOL 489 | Population Ecology | 3 |
| EEOB 564 | Wetland Ecology | 3 |
| EEOB 569 | Biogeography | 3 |
| EEOB 576 | Functional Ecology | 3 |
| EEOB 577 | Concepts in Ecology & Evolution | 1 |
| ENT 471 | Insect Ecology | 3 |
| NREM 301 | Natural Resource Ecol & Soils | 4 |

### Conservation and Restoration

| Course # | Course Name | Credits |
|---|---|---|
| AGRON 317 | Principles of Weed Science | 3 |
| AGRON 354 | Soils and Plant Growth | 3 |
| AGRON 354L | Soils and Plant Growth Lab | 1 |
| BIOL 462 | Evolutionary Genetics | 3 |
| BIOL 471 | Intro Conservation Biology | 3 |
| EEOB 531 | Conservation Biology | 3 |
| EEOB 535 | Restoration Ecology | 3 |
| FOR 302 | Silviculture | 3 |
| HORT 322 | Plant Propagation | 3 |
| NREM 345 | Nat.Res. Photogrammetry & GIS | 3 |
| NREM 390 | Fire Ecology and Management | 3 |
| NREM 407 | Watershed Management | 4 |
| NREM 446 | GPS & GIS for Nat.Res. Manag. | 3 |
| NREM 452 | Ecosystem Management | 3 |
| PL P 416 | Forest Insects & Diseases | 3 |
| PL P 416L | Forest Insects & Diseases Lab | 1 |
| PL P 494 | Seed Pathology | 2 |

**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 357 | Biology of Plants | 3 |
| BIOL 364 | Invertebrate Biology | 3 to 4 |
| BIOL 365 | Vertebrate Biology | 4 |
| BIOL 366 | Plant Systematics | 4 |
| BIOL 430 | Principles of Plant Physiology | 3 |
| BIOL 439 | Environmental Physiology | 3 to 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: *https://www.esa.org*
International Association for Society and Natural Resources: *https://www4.iasnr.org*
Society for Conservation Biology: *http://conbio.org*
Society for Ecological Restoration: *https://www.ser.org/default.aspx*
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*