

Approved Advanced Biology Courses

Biology Program at Iowa State University

| Course # | Biology Course Name | Credits | Course # | Biology Course Name | Credits |
|-------------|---|---------|-------------|--|---------|
| BIOL 322 | Intro Bioinformatics and Comp. Bio | 3 | BIOL 430 | Principles of Plant Physiology | 3 |
| BIOL 328 | Mole. & Cell. Bio of Human Disease | 3 | BIOL 434 | Endocrinology | 3 |
| BIOL 335 | Human & Animal Physiology | 3 | BIOL 436 | Neurobiology | 3 |
| BIOL 335L • | Human & Animal Physiology Lab | 1 | BIOL 451 • | Plant Evolution & Phylogeny | 4 |
| BIOL 336 | Ecological & Evolutionary Animal Phys | 3 | BIOL 454 • | Plant Anatomy | 4 |
| BIOL 344 | Human Reproduction | 3 | BIOL 455 • | Bryophyte and Lichen Biodiversity | 3 |
| BIOL 349 • | Genome Perspective in Biology | 3 | BIOL 456 • | Principles of Mycology | 3 |
| BIOL 350 • | Comprehensive Human Anatomy | 4 | BIOL 457 | Herpetology | 2 |
| BIOL 351 • | Comparative Chordate Anatomy | 5 | BIOL 457L • | Herpetology Lab | 1 |
| BIOL 352 • | Vertebrate Histology | 4 | BIOL 458 | Ornithology | 2 |
| BIOL 353 | Introductory Parasitology | 3 | BIOL 458L • | Ornithology Lab | 1 |
| BIOL 354 | Animal Behavior | 3 | BIOL 459 | Mammalogy | 2 |
| BIOL 354L • | Animal Behavior Lab | 1 | BIOL 459L • | Mammalogy Lab | 1 |
| BIOL 355 | Plants and People | 3 | BIOL 462 | Evolutionary Genetics | 3 |
| BIOL 356 • | Dendrology | 4 | BIOL 464 | Wetland Ecology | 3 |
| BIOL 357 | Biology of Plants | 3 | BIOL 465 | Macroevolution | 3 |
| BIOL 358 • | Bee Biology, Mngm't, and Beekeeping | 3 | BIOL 471 | Introductory Conservation Biology | 3 |
| BIOL 364 | Invertebrate Biology | 3-4 | BIOL 472 | Community Ecology | 3 |
| BIOL 365 • | Vertebrate Biology | 4 | BIOL 474 | Plant Ecology | 3 |
| BIOL 366 • | Plant Systematics | 4 | BIOL 476 | Functional Ecology | 3 |
| BIOL 370 • | GIS for Ecology and Env't Science | 1-6 | BIOL 480 • | Studies in Marine Biology | 1-8 |
| BIOL 371 • | Ecological Methods | 3 | BIOL 481 • | Summer Field Studies | 1-8 |
| BIOL 375X | Marine Ecology & Ecosystems Dynamics | 3 | BIOL 482 • | Tropical Biology | 1-4 |
| BIOL 381 | Environmental Systems I | 3 | BIOL 483 | Environmental Biogeochemistry | 3 |
| BIOL 382 • | Environmental Systems II | 3 | BIOL 484 | Ecosystem Ecology | 3 |
| BIOL 393 • | N. American Field Trips | 1-4 | BIOL 486 | Aquatic Ecology | 3 |
| BIOL 394 • | International Field Trips | 1-4 | BIOL 486L • | Aquatic Ecology Lab | 1 |
| BIOL 395X | Professional Dev't in Biological Sciences | 2 | BIOL 487 | Microbial Ecology | 3 |
| BIOL 401 | Intro Bioinformatics & Comp. Biology | 4 | BIOL 488 • | Identification of Aquatic Organisms | 1 |
| BIOL 402 | Introduction to Pathology | 3 | BIOL 489 • | Population Ecology | 3 |
| BIOL 403X | Introduction to Pathology II | 3 | BIOL 490 | Independent Study | 1 |
| BIOL 406 | Bioinformatics of OMICS | 3 | BIOL 491 • | Undergraduate Teaching Experience | 1-2 |
| BIOL 414 | Life History & Reproductive Strategy | 3 | BIOL 492 | Preparing for Grad School in Biology | 1 |
| BIOL 421 | Biological Principles of Aging | 3 | BIOL 494 • | Biology Internship | 1-3 |
| BIOL 423 | Developmental Biology | 3 | BIOL 495 | Undergraduate Seminar (various topics) | 1-3 |
| BIOL 423L • | Developmental Biology Lab | 1 | BIOL 499 • | Undergraduate Research | 1-3 |
| BIOL 428 | Cell Biology | 3 | | | |

Students may apply a maximum of 7 credits of the following: BIOL 480, 481, 490 (2 cr max), 491 (2 cr max), 494, and 499 towards advanced biology. Lab courses are denoted by •. Courses below are graduate level courses open to undergraduates by prerequisite or permission and typically offered alternate semesters.

| Course # | Graduate Course Name | Credits | Course # | Graduate Course Name | Credits |
|------------|--|---------|-------------|---|---------|
| EEOB 507 | Advanced Animal Behavior | 3 | EEOB 581 | Environmental Systems I | 3-4 |
| EEOB 514 | Life History and Reproductive Strategies | 3 | EEOB 582 • | Environmental Systems II | 3 |
| EEOB 521 | Biological Principles of Aging | 3 | EEOB 584 | Ecosystem Science | 3 |
| EEOB 531 | Conservation Biology | 3 | EEOB 585 | Advanced Community Ecology | 3 |
| EEOB 534 | Endocrinology | 3 | EEOB 586 | Aquatic Ecology | 3 |
| EEOB 535 • | Restoration Ecology | 3 | EEOB 586L • | Aquatic Ecology Lab | 1 |
| EEOB 546 | Computational Skills for Biological Data | 3 | EEOB 587 | Microbial Ecology | 3 |
| EEOB 551 • | Plant Evolution and Phylogeny | 4 | EEOB 589 • | Population Ecology | 3 |
| EEOB 553 | Agrostology | 3 | EEOB 596 | Ecology and Society | 3 |
| EEOB 555 • | Bryophyte and Lichen Biodiversity | 3 | GDCB 510 | Transmission Genetics | 3 |
| EEOB 559 | Mammalogy | 2 | GDCB 511 | Molecular Genetics | 3 |
| EEOB 561 | Evolutionary and Ecological Genomics | 3 | GDCB 513 | Plant Metabolism | 2 |
| EEOB 562 | Evolutionary Genetics | 3 | GDCB 528 | Advances in Molecular Cell Biology | 3 |
| EEOB 563 | Molecular Phylogenetics | 3 | GDCB 533 | Advances in Developmental Biology | 3 |
| EEOB 564 | Wetland Ecology | 3 | GDCB 536 | Statistical Genetics | 4 |
| EEOB 565 | Macroevolution | 3 | GDCB 542 • | Intro to Molecular Biology Techniques | 1 |
| EEOB 566 | Molecular Evolution | 3 | GDCB 544 | Fundamentals of Bioinformatics | 4 |
| EEOB 567 | Empirical Population Genetics | 3 | GDCB 545 | Plant Molecular, Cell and Dev't Biology | 3 |
| EEOB 568 • | Advanced Systematics | 3 | GDCB 556 | Cell, Molec, & Dev't Neuroscience | 3 |
| EEOB 569 | Biogeography | 3 | GDCB 557 | Advanced Neuroscience Techniques | 3 |
| EEOB 573 | Techniques for Biology Teaching | 1-2 | GDCB 568 | Statistical Bioinformatics | 3 |
| EEOB 576 | Functional Ecology | 3 | GDCB 569 | Structural Bioinformatics | 3 |
| EEOB 577 | Concepts in Theoretical Ecol. & Evol. | 1 | GDCB 570 | Systems Biology | 3 |
| | | | GDCB 585 | Fund. of Predictive Plant Phenomics | 4 |

This page lists approved advanced biology courses offered by other departments at Iowa State. These courses may have pre-requisites not included in this list that do not count as advanced biology courses.

Agronomy Courses

| | Credits |
|---|---------|
| AGRON 316 Crop Structure-Function Relationships | 3 |
| AGRON 317 Principles of Weed Science | 3 |
| AGRON 338 • Seed Science and Technology | 3 |
| AGRON 354 Soils and Plant Growth | 3 |
| AGRON 354L • Soils and Plant Growth Lab | 1 |
| AGRON 421 Introduction to Plant Breeding | 3 |
| AGRON 485 • Soil & Environmental Microbiology | 3 |

Animal Science Courses

| | Credits |
|---|---------|
| AN S 313 Exercise Physiology of Animals | 2 |
| AN S 319 Animal Nutrition | 3 |
| AN S 331 Domestic Animal Reproduction | 3 |
| AN S 332 • Lab Methods in Animal Reproduction | 1 |
| AN S 333 Embryo Transfer & Related Technologies | 3 |
| AN S 334 • Embryo Transfer Laboratory | 1 |
| AN S 337 Lactation | 3 |
| AN S 345 Growth & Dev't of Domestic Animals | 3 |
| AN S 352 • Genetic Improvem't of Domestic Animals | 3 |
| AN S 419 Advanced Animal Nutrition | 2 |

Anthropology Courses

| | Credits |
|---|---------|
| ANTHR 307 • Biological Anthropology | 3 |
| ANTHR 317 Primate Behavior, Ecology & Evolution | 3 |
| ANTHR 319 • Skeletal Biology | 3 |
| ANTHR 424 • Forensic Anthropology | 3 |
| ANTHR 438 Primate Evolutionary Ecology & Behavior | 3 |
| ANTHR 482 Topics in Biological Anthropology | 3 |

Biochemistry Courses

| | Credits |
|--|---------|
| BBMB 405 Biochemistry II | 3 |
| BBMB 411 • Techniques in Biochemical Research | 4 |
| BBMB 420 Mammalian Biochemistry | 3 |
| BBMB 430 Prokaryotic Diversity and Ecology | 3 |
| BBMB 440 • Microbial Phys, Diversity, & Genetics Lab | 4 |

Biomedical Studies Courses

| | Credits |
|---|---------|
| B M S 329 Anat & Phys of Domestic Animals | 3 |
| B M S 401 • Intro Aquatic Animal Medicine | 1 |
| B M S 438 Principles of Physiology | 4 |
| B M S 448 • Principles of Human Gross Anatomy | 4 |

Entomology Courses

| | Credits |
|--|---------|
| ENT 370 • Insect Biology | 3 |
| ENT 374 Insects and our Health | 3 |
| ENT 374L • Insects and our Health Laboratory | 1 |
| ENT 375 Plant Protection Using Natural Enemies | 3 |
| ENT 425 • Aquatic Insects | 3 |
| ENT 471 • Insect Ecology | 3 |

Food Science & Human Nutrition Courses

| | Credits |
|---|---------|
| FS HN 360 Adv. Human Nutrition & Metabolism | 3 |
| FS HN 362 Nutrition in Growth and Development | 3 |
| FS HN 364 Nutrit. & Prevention of Chronic Disease | 3 |
| FS HN 367 Medical Terminology | 1 |

Genetics Courses

| | Credits |
|-----------------------------|---------|
| GEN 340 Human Genetics | 3 |
| GEN 409 Molecular Genetics | 3 |
| GEN 410 Analytical Genetics | 3 |

Geology Courses

| | Credits |
|-------------------------------|---------|
| GEOL 406 Geology Field Course | 1-2 |
| GEOL 412 Micropaleontology | 3 |

Health Studies Courses

| | Credits |
|------------------------|---------|
| H S 350 Human Diseases | 3 |

Horticulture Courses

| | Credits |
|----------------------------------|---------|
| HORT 321 Horticulture Physiology | 3 |
| HORT 322 • Plant Propagation | 3 |

Kinesiology Courses

| | Credits |
|-----------------------------------|---------|
| KIN 355 Biomechanics | 3 |
| KIN 363 Basic Electrocardiography | 2 |

Microbiology Courses

| | Credits |
|---|---------|
| MICRO 302 Biology of Microorganisms | 3 |
| MICRO 302L • Microbiology Lab | 1 |
| MICRO 310 Medical Microbiology | 3 |
| MICRO 310L • Medical Microbiology Lab | 1 |
| MICRO 320 Molecular and Cellular Bacteriology | 4 |
| MICRO 360 Global Health | 3 |
| MICRO 402 Microbial Genetics and Genomics | 3 |
| MICRO 408 Virology | 3 |
| MICRO 420 Food Microbiology | 3 |
| MICRO 475 Immunology | 3 |
| MICRO 475L • Immunology Laboratory | 1 |

Natural Resource Ecology & Management Courses

| | Credits |
|--|---------|
| A ECL 321 • Fish Biology | 3 |
| A ECL 366 • Natural History of Iowa Vertebrates | 3 |
| A ECL 415 • Ecol. of Freshwater Inverts/Plants/Algae | 3 |
| A ECL 418 • Stream Ecology | 3 |
| A ECL 442 Aquaculture | 3 |
| A ECL 454 Principles of Wildlife Disease | 3 |
| FOR 302 • Silviculture | 3 |
| NREM 301 • Natural Resource Ecology & Soils | 4 |
| NREM 345 • Natural Resource Photogrammetry & GIS | 3 |
| NREM 357 • Midwestern Prairie Plants | 1 |
| NREM 358 • Forest Herbaceous Layer | 1 |
| NREM 390 Fire Ecology and Management | 3 |
| NREM 407 • Watershed Management | 4 |
| NREM 446 • Integrating GPS & GIS for Nat. Res. | 3 |
| NREM 452 • Ecosystem Management | 3 |

Plant Pathology Courses

| | Credits |
|--|---------|
| PL P 408 Principles of Plant Pathology | 3 |
| PL P 416 Forest Insects & Diseases | 3 |
| PL P 416L • Forest Insects & Diseases Laboratory | 1 |
| PL P 477 Bacterial-Plant Interactions | 3 |
| PL P 494 Seed Pathology | 2 |

Psychology Courses

| | Credits |
|------------------------------|---------|
| PSYCH 310 Brain and Behavior | 3 |
| PSYCH 315 Drugs and Behavior | 3 |

Toxicology Courses

| | Credits |
|---------------------------------------|---------|
| TOX 401 Principles of Toxicology | 3 |
| TOX 450 Pesticides in the Environment | 3 |

Iowa Lakeside Laboratory – courses taken in summer at Iowa Lakeside Lab often count towards advanced biology requirements. Please check for available courses on the Lakeside Lab web page (<https://iowalakesidelab.org/>) and consult your advisor for those that apply to the degree program.