ANIMAL ECOLOGY (A ECL)

Any experimental courses offered by A ECL can be found at:
registrar.iastate.edu/faculty-staff/courses/explistings/ (http://www.registrar.iastate.edu/faculty-staff/courses/explistings/)

Courses primarily for undergraduates:

A ECL 231: Principles of Wildlife & Fisheries Conservation
Cr. 3. S.
Prereq: BIOL 211, BIOL 212, NREM 120
Introduction to the principles of wildlife and fisheries management. Case studies will be explored along with assessment methods used to understand management including conservation of populations, species and communities, as well as habitat preservation and restoration.

A ECL 312: Ecology
(Cross-listed with BIOL, ENSCI). (3-3) Cr. 4. F.SS.
Prereq: BIOL 211, BIOL 211L, BIOL 212, and BIOL 212L
Fundamental concepts and principles of ecology dealing with organisms, populations, communities, and ecosystems. Laboratory and field exercises examine ecological principles and methods as well as illustrate habitats.

A ECL 312I: Ecology
(Cross-listed with ENSCI, IA LL). Cr. 4. SS.
An introduction to the principles of ecology at the population, community and ecosystem level. Field studies of local lakes, wetlands and prairies are used to examine factors controlling distributions, interactions, and roles of plants and animals in native ecosystems.

A ECL 321: Fish Biology
(2-3) Cr. 3. S.
Prereq: A ECL 365
Biology, ecology, and evolution of fishes. Emphasis on structure, physiology, and behavior, including a focus on the conservation and management of fishes and their habitats. Laboratory focus on fish morphology, survey methods, identification, distribution, habits, and habitats of fishes.

A ECL 326I: Ornithology
(Cross-listed with IA LL). Cr. 2. SS.
The biology, ecology, and behavior of birds with emphasis on field studies of local avifauna. Group projects stress techniques of population analysis and methodology for population studies.

A ECL 333: Fisheries Techniques
(Cross-listed with NREM). (1-3) Cr. 2. F.
Prereq: BIOL 212
Introduction to techniques used in the collection and interpretation of fish population data in the field and in the lab. Course objectives include an understanding of population survey methodology and improving student critical thinking and teamwork skills. Laboratory focuses on field trips and hands-on sampling experience.

A ECL 365: Vertebrate Biology
(Cross-listed with BIOL). (3-2) Cr. 4. F.
Prereq: BIOL 211, BIOL 211L, BIOL 212, BIOL 212L
Evolution, biology, and classification of fish, amphibians, reptiles, birds, and mammals. Emphasis on a comparative analysis of the structure and function of organ systems. Laboratory exercises concentrate on morphology and identification of orders of vertebrates.

A ECL 366: Natural History of Iowa Vertebrates
(2-3) Cr. 3. S.
Prereq: BIOL 211, BIOL 211L, BIOL 212, BIOL 212L
Vertebrate fauna of Iowa, including fishes, amphibians, reptiles, birds, and mammals. Species identification, habitat requirements, community structure and assessment, conservation issues that include historical population changes and value of wild animals to the region's ecological and economic health.

A ECL 371: Ecological Methods
(Cross-listed with BIOL). (2-3) Cr. 3. F.
Prereq: A ECL 312; STAT 101 or STAT 104
Quantitative techniques used in management of natural resources with emphasis on inventory and manipulation of habitat and animal populations.

A ECL 401: Intro to Aquatic Animal Medicine
(Cross-listed with B M S). (1-2) Cr. 1. S.
8-week course. Introductory course with focus on fin fish production, health and medicine. Course content will help define future roles for veterinarians, producers, and service providers. Emphasis will be placed on water-evaluation, anatomy, pathology, infectious diseases, nutrition, regulatory constraints in production, food safety, biosecurity and current research. Field trip to aquaculture facility.

A ECL 404I: Behavioral Ecology
(Cross-listed with IA LL). Cr. 4. Alt. SS., offered even-numbered years.
Prereq: Two semesters of biology
Animal coloniality, courtship, territoriality, predator defense, habitat selection, foraging, mating systems, and parental care will be examined in the field in order to evaluate various ecological and evolutionary theories of animal behavior.

A ECL 406: Wildlife Camp
Cr. 3. F.
Prereq: BIOL 211 and permission of instructor; restricted to Animal Ecology majors
Introduction to methods and career options in wildlife research and management through field work. Two-week field work experience followed by on-campus reflection, analysis and presentation of field data.

A ECL 415: Ecology of Freshwater Invertebrates, Plants, and Algae
(Dual-listed with A ECL 515). (2-3) Cr. 3. F.
Prereq: A ECL 312
Identification, biology, and ecological requirements of freshwater invertebrates, plants and algae. Additional emphases on community sampling methods and analysis, and use of organisms as tools for aquatic ecosystem health assessment.

A ECL 418: Stream Ecology
(Dual-listed with A ECL 518). (Cross-listed with ENSCI). (2-3) Cr. 3. Alt. F., offered odd-numbered years.
Prereq: A ECL 486
Biological, chemical, physical, and geological processes that determine the structure and function of flowing water ecosystems. Current ecological theories as well as applications to stream management for water quality and fisheries.

A ECL 419I: Vertebrate Ecology and Evolution
(Cross-listed with IA LL). Cr. 4. SS.
Field and laboratory study of representative vertebrates of northwestern Iowa. Observations and experimentation emphasize ecological histories by integrating concepts of functional morphology, behavioral ecology, and evolutionary biology.

A ECL 420I: Amphibians and Reptiles
(Cross-listed with IA LL). Cr. 2. Alt. SS., offered even-numbered years.
Prereq: Two semesters of biology
Ecology, behavior, and conservation biology of amphibians and reptiles with emphasis on their anatomy and morphology; temperature and water regulation; locomotion; life history; reproduction; population and community ecology; and conservation.

A ECL 425: Aquatic Insects
(Dual-listed with A ECL 525). (Cross-listed with ENT). (2-3) Cr. 3. Alt. S., offered odd-numbered years.
Prereq: BIOL 312 or equivalent
Morphology, ecology, diversity, and significance of aquatic insects, with emphasis on the collection, curation and identification of taxa in local streams and lakes.

A ECL 440: Fishery Management
(Dual-listed with A ECL 540). (2-3) Cr. 3. F.
Prereq: A ECL 312, A ECL 321, A ECL 333; STAT 101 or STAT 104; credit or enrollment in A ECL 486
Biological basis of fishery management, fishery problems, and management practices for freshwater, anadromous, and marine fisheries.

A ECL 442: Aquaculture
(Dual-listed with A ECL 542). (3-0) Cr. 3. S.
Prereq: BIOL 211 and BIOL 212.
Concepts related to the culture of aquatic organisms including culture systems, water quality, nutrition, genetics, diseases, and marketing.

A ECL 451: Wildlife Ecology and Management
(2-3) Cr. 3. S.
Prereq: A ECL 371
Ecological theory and practice of wildlife management, including, population ecology, habitat management, and current issues in the field. Course involves a series of case studies addressing actual wildlife issues using field and quantitative methods.

A ECL 454: Principles of Wildlife Disease
(Dual-listed with A ECL 554). (3-0) Cr. 3. S.
Prereq: Junior standing and at least 10 credits in biological sciences at the 300+ level
Ecological and epidemiological aspects of diseases as they relate to wildlife populations. Topics to be covered include: major classes of disease; detection, description, monitoring, and management of disease; characteristics and interactions between disease agents and wildlife hosts; relationships among wildlife, domestic animal, and human health.

A ECL 455: International Wildlife Issues
(3-0) Cr. 3. F.
Prereq: A ECL 365, A ECL 312 or graduate standing; NREM 120
Biological, political, social, and economic factors affecting the management of international wildlife resources.
Meets International Perspectives Requirement.

A ECL 457: Herpetology
(Cross-listed with BIOL). (2-0) Cr. 2. F.
Prereq: BIOL 351 or BIOL 365
Biology, ecology, and evolution of amphibians (salamanders, frogs, caecilians) and reptiles (lizards, snakes, tuatara, turtles, crocodilians). Emphasis on structure, physiological adaptation to different environments, behavior, reproduction, roles of amphibians and reptiles in ecosystems, and conservation. Laboratory focus on survey methods, identification, relationships, distribution, habits, and habitats of amphibians and reptiles.

A ECL 457L: Herpetology Laboratory
(Cross-listed with BIOL). (0-3) Cr. 1. F.
Prereq: BIOL 351 or BIOL/A ECL 365; concurrent registration in BIOL 457 or A ECL 457
Laboratory to accompany Biology/Animal Ecology 457. Focus on survey methods, identification, relationships, distribution, habits, and habitats of amphibians and reptiles.

A ECL 458: Ornithology
(Cross-listed with BIOL). (2-0) Cr. 2. S.
Prereq: A ECL 365 or BIOL 351
Biology, evolution, ecology and taxonomy of birds. Emphasis on structure, physiology, behavior, communication, navigation, reproduction, and conservation.

A ECL 458L: Ornithology Laboratory
(Cross-listed with BIOL). (0-3) Cr. 1. S.
Prereq: BIOL 351 or AECL/BIOL 365. Concurrent enrollment in AECL/BIOL 458 is required.
Laboratory complements lecture topics with emphasis on external anatomy, identification and distribution of Midwest birds, and field trips.

A ECL 459: Mammalogy
(Cross-listed with BIOL). (2-0) Cr. 2. S.
Prereq: BIOL 351 or A ECL 365
Biology, ecology, and evolution of mammals. Emphasis on structure, physiological adaptation to different environments, behavior, reproduction, roles of mammals in ecosystems, and conservation.

A ECL 459L: Mammalogy Laboratory
(Cross-listed with BIOL). (0-3) Cr. 1. S.
Prereq: BIOL 351 or BIOL/AECL 365; concurrent enrollment in AECL 459 or BIOL 459 required.
Laboratory focus on identification, survey methods, distribution, habits, and habitats of mammals. Several field trips.

A ECL 471: Introductory Conservation Biology
(Cross-listed with BIOL). Cr. 3. S.
Prereq: BIOL 312
Examination of conservation issues from a population and community perspective. The role of genetics, demography, and environment in determining population viability, habitat fragmentation, reserve design, biodiversity assessment, and restoration ecology.

A ECL 480: Studies in Marine Biology
Cr. 1-8. Repeatable. SS.
Courses taken at Gulf Coast Research Laboratory and other marine biological stations are transferred to Iowa State University under this number.

A ECL 486: Aquatic Ecology
(Dual-listed with A ECL 586). (Cross-listed with BIOL, ENSCI). (3-0) Cr. 3. F.
Prereq: Biol 312 or EnSci 381 or EnSci 402 or NREM 301
Structure and function of aquatic ecosystems with application to fishery and pollution problems. Emphasis on lacustrine, riverine, and wetland ecology.

A ECL 486L: Aquatic Ecology Laboratory
(Dual-listed with A ECL 586L). (Cross-listed with BIOL, ENSCI). (0-3) Cr. 1. F.
Prereq: Concurrent enrollment in BIOL 486
Field trips and laboratory exercises to accompany 486. Hands-on experience with aquatic research and monitoring techniques and concepts.

A ECL 489: Population Ecology
(Dual-listed with A ECL 589). (Cross-listed with BIOL). (2-2) Cr. 3. Alt. F., offered even-numbered years.
Prereq: BIOL 312, STAT 101 or STAT 104, a course in calculus, or graduate standing
Concepts and theories of population dynamics with emphasis on models of growth, predation, competition, and regulation.

Courses primarily for graduate students, open to qualified undergraduates:

A ECL 515: Ecology of Freshwater Invertebrates, Plants, and Algae
(Dual-listed with A ECL 415). (2-3) Cr. 3. F.
Prereq: A ECL 312
Identification, biology, and ecological requirements of freshwater invertebrates, plants and algae. Additional emphases on community sampling methods and analysis, and use of organisms as tools for aquatic ecosystem health assessment.

A ECL 516: Avian Ecology
(3-0) Cr. 3. Alt. S., offered even-numbered years.
Prereq: A ECL 365, A ECL 312, or graduate standing
Current topics and theories including avian breeding and foraging ecology, population biology, community structure, habitat selection, field methodologies, and data interpretation.

A ECL 518: Stream Ecology
(Dual-listed with A ECL 418). (Cross-listed with ENSCI). (2-3) Cr. 3. Alt. F., offered odd-numbered years.
Prereq: A ECL 486
Biological, chemical, physical, and geological processes that determine the structure and function of flowing water ecosystems. Current ecological theories as well as applications to stream management for water quality and fisheries.

A ECL 520: Fisheries Science
(3-0) Cr. 3. Alt. S., offered odd-numbered years.
Prereq: A ECL 312, A ECL 321
Concepts, approaches, and techniques for assessment of recreational and commercial fisheries. Scope will range from individual fish to entire ecosystems, both freshwater and marine.

A ECL 523I: Fish Ecology
(Cross-listed with IA LL). Cr. 2. Alt. SS., offered even-numbered years.
Basic principles of fish interaction with the biotic and abiotic environment. Field methods, taxonomy, and biology of fish with emphasis on the fish fauna of northwestern Iowa.

A ECL 525: Aquatic Insects
(Dual-listed with A ECL 425). (Cross-listed with ENT). (2-3) Cr. 3. Alt. S., offered odd-numbered years.
Prereq: BIOL 312 or equivalent
Morphology, ecology, diversity, and significance of aquatic insects, with emphasis on the collection, curation and identification of taxa in local streams and lakes.

A ECL 526I: Advanced Field Ornithology
(Cross-listed with IA LL). Cr. 2. SS.
Prereq: Concurrent registration in IA LL 326I
Field study of birds of the upper Midwest; extended field trip to Minnesota and Wisconsin; individual or group project.

A ECL 531: Conservation Biology
(Cross-listed with EEOB). (3-0) Cr. 3. Alt. S., offered even-numbered years.
Prereq: BIOL 312; BIOL 313 or graduate standing
Examination of conservation issues from a population and a community perspective. Population-level analysis will focus on the role of genetics, demography, and environment in determining population viability. Community perspectives will focus on topics such as habitat fragmentation, reserve design, biodiversity assessment, and restoration ecology.

A ECL 531I: Conservation Biology
(Cross-listed with EEOB, IA LL). Cr. 4. Alt. SS., offered even-numbered years.
Prereq: IA LL 312I
Population-and community-level examination of factors influencing the viability of plant and animal populations from both demographic and genetic perspectives; assessment of biodiversity; design and management of preserves.

A ECL 535I: Restoration Ecology
(Cross-listed with EEOB, ENSCI, IA LL). Cr. 2. Alt. SS., offered even-numbered years.
Prereq: A course in ecology
Ecological principles for the restoration of native ecosystems; establishment (site preparation, selection of seed mixes, planting techniques) and management (fire, mowing, weed control) of native vegetation; evaluation of restorations. Emphasis on the restoration of prairie and wetland vegetation.

A ECL 540: Fishery Management
(Dual-listed with A ECL 440). (2-3) Cr. 3. F.
Prereq: A ECL 312, A ECL 321, A ECL 333; STAT 101 or STAT 104; credit or enrollment in A ECL 486
Biological basis of fishery management, fishery problems, and management practices for freshwater, anadromous, and marine fisheries.

A ECL 542: Aquaculture
(Dual-listed with A ECL 442). (3-0) Cr. 3. S.
Prereq: BIOL 211 and BIOL 212.
Concepts related to the culture of aquatic organisms including culture systems, water quality, nutrition, genetics, diseases, and marketing.

A ECL 551: Behavioral Ecology
(2-2) Cr. 3. Alt. F., offered odd-numbered years.
Prereq: a course in ecology or animal behavior
The study of how an animal's behavior affects its ability to survive and reproduce in its environment. Course topics, such as foraging behavior, sexual selection, parental care, etc., represent the interface of ecology, evolution, and behavior.

A ECL 554: Principles of Wildlife Disease
(Dual-listed with A ECL 454). (3-0) Cr. 3. S.
Prereq: Graduate classification
Ecological and epidemiological aspects of disease as they relate to wildlife populations. Topics to be covered include: major classes of disease; detection, description, monitoring, and management of disease; characteristics and interactions between disease agents and wildlife hosts; relationship among wildlife, domestic animal, and human health.

A ECL 573: Techniques for Biology Teaching
(Cross-listed with EEOB, IA LL). Cr. 1-2. Repeatable. SS.
The development and implementation of laboratory exercises suitable for inclusion in elementary, middle, high school, and community college biology and environmental courses. Exercises will be built around common organisms and ecosystems in Iowa. Field trips.

A ECL 573A: Techniques for Biology Teaching : Animal Biology
(Cross-listed with EEOB, IA LL). Cr. 1-2. Repeatable. SS.
The development and implementation of laboratory exercises suitable for inclusion in elementary, middle, high school, and community college biology and environmental courses. Exercises will be built around common organisms and ecosystems in Iowa. Field trips.

A ECL 573G: Techniques for Biology Teaching: Limnology
(Cross-listed with EEOB, IA LL). Cr. 1-2. Repeatable. SS.
The development and implementation of laboratory exercises suitable for inclusion in elementary, middle, high school, and community college biology and environmental courses. Exercises will be built around common organisms and ecosystems in Iowa. Field trips.

A ECL 573I: Techniques for Biology Teaching: Insect Ecology
(Cross-listed with EEOB, IA LL). Cr. 1-2. Repeatable. SS.
The development and implementation of laboratory exercises suitable for inclusion in elementary, middle, high school, and community college biology and environmental courses. Exercises will be built around common organisms and ecosystems in Iowa. Field trips.

A ECL 573W: Techniques for Biology Teaching: Project WET
(Cross-listed with EEOB, IA LL). Cr. 1-2. Repeatable. SS.
The development and implementation of laboratory exercises suitable for inclusion in elementary, middle, high school, and community college biology and environmental courses. Exercises will be built around common organisms and ecosystems in Iowa. Field trips.

A ECL 586: Aquatic Ecology
(Dual-listed with A ECL 486). (Cross-listed with EEOB, ENSCI). (3-0) Cr. 3. F.
Prereq: Biol 312 or EnSci 381 or EnSci 402 or NREM 301
Structure and function of aquatic ecosystems with application to fishery and pollution problems. Emphasis on lacustrine, riverine, and wetland ecology.

A ECL 586L: Aquatic Ecology Laboratory
(Dual-listed with A ECL 486L). (Cross-listed with EEOB, ENSCI). (0-3) Cr. 1. F.
Prereq: Concurrent enrollment in BIOL 486
Field trips and laboratory exercises to accompany 486. Hands-on experience with aquatic research and monitoring techniques and concepts.

A ECL 589: Population Ecology
(Dual-listed with A ECL 489). (Cross-listed with EEOB). (2-2) Cr. 3. Alt. F., offered even-numbered years.
Prereq: BIOL 312, STAT 101 or STAT 104, a course in calculus, or graduate standing
Concepts and theories of population dynamics with emphasis on models of growth, predation, competition, and regulation.

A ECL 590: Graduate Independent Study
(Cross-listed with ANTHR, EEOB, IA LL). Cr. 1-4. Repeatable. SS.
Prereq: Graduate classification and permission of instructor

A ECL 590I: Special Topics: Graduate Independent Study
(Cross-listed with ANTHR, EEOB, IA LL). Cr. 1-4. Repeatable. SS.
Prereq: Graduate classification and permission of instructor

A ECL 599: Creative Component
Cr. arr.
Prereq: Nonthesis M.S. option only

Courses for graduate students:

A ECL 611: Analysis of Populations
(2-2) Cr. 3. Alt. F., offered even-numbered years.
Prereq: BIOL 312; STAT 401; a course in calculus
Quantitative techniques for analyzing vertebrate population data to estimate parameters such as density and survival. Emphasis on statistical inference and computing.

A ECL 698: Animal Ecology Teaching Practicum
Cr. 1-3. Repeatable. F.S.SS.
Prereq: Graduate classification in animal ecology and permission of instructor
Graduate student experience in the animal ecology teaching program. Offered on a satisfactory-fail basis only.

A ECL 699: Research
Cr. arr. Repeatable.

A ECL 699I: Research
(Cross-listed with ANTHR, EEOB, GDCB, IA LL). Cr. 1-4. Repeatable.