

ANIMAL ECOLOGY (A ECL)

Any experimental courses offered by A ECL can be found at:

registrar.iastate.edu/faculty-staff/courses/explisting/ (<http://www.registrar.iastate.edu/faculty-staff/courses/explisting/>)

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 212 or BIOL 251)

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 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 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

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 372: Wildlife Population Methods

(1-8) Cr. 4. SS.

Prereq: BIOL 312 or NREM 311

Field-intensive study of population ecology. Emphasis on hands-on learning of study design and techniques to assess population trends in plants, invertebrates, and vertebrates inhabiting terrestrial and aquatic ecosystems.

A ECL 375: Marine Ecology and Ecosystems Dynamics

(Cross-listed with BIOL, ENSCI). (3-0) Cr. 3. S.

Prereq: BIOL 211

Overview of the ecological processes, ecosystems, and biodiversity in marine environments. Ever-changing dynamics caused by environmental disturbances, internal forces, or by human impacts on species and ecosystems.

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 406: Wildlife Camp

Cr. 3. F.

Prereq: BIOL 211; Animal Ecology major; Permission of Instructor

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 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

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 435: Entomology Field Trip

(Cross-listed with ENT). Cr. 2. Repeatable, maximum of 2 times. Alt. S., offered irregularly. Alt. SS., offered irregularly.

Prereq: BIO 312; Permission of Instructor

Field trip to study insects of major terrestrial and aquatic ecosystems. Location and duration vary. ENT 370 or ENT 425 recommended.

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 concurrent 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; 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 classification; 10 credits in BIOL 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 365 or A ECL 365; Concurrent enrollment 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: (A ECL 365 or BIOL 351); concurrent enrollment in A ECL 458 or BIOL 458

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: A ECL 365 or BIOL 351

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: (A ECL 365 or BIOL 351); concurrent enrollment in (A ECL 459 or BIOL 459)

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 319 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 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

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 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 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 concurrent 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; 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: Junior classification; 10 credits in BIOL 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 586: Aquatic Ecology

(Dual-listed with A ECL 486). (Cross-listed with EEOB, ENSCI). (3-0) Cr. 3.

F.

Prereq: BIOL 312 or ENSCI 319 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 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.