WILDLIFE AND FISHERIES CONSERVATION AND ECOLOGY (WFCE)

Courses primarily for undergraduates:

WFCE 2310: Principles of Wildlife & Fisheries Conservation
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 2110, BIOL 2120*, and* NREM 1200
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. (Typically Offered: Spring)

WFCE 3120: Ecology
(Cross-listed with ENSCI 3120/ BIOL 3120).
Credits: 4. Contact Hours: Lecture 3, Laboratory 3.
Prereq: BIOL 2110*; (*BIOL 2120 *or* BIOL 2510*)*
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. (Typically Offered: Fall, Summer)

WFCE 3210: Ichthyology
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 3650
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. (Typically Offered: Spring)

WFCE 3330: Fisheries Techniques
Credits: 2. Contact Hours: Lecture 1, Laboratory 3.
Prereq: BIOL 2120
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. (Typically Offered: Fall)

WFCE 3650: Vertebrate Biology
(Cross-listed with BIOL 3650).
Credits: 4. Contact Hours: Lecture 3, Laboratory 2.
Prereq: BIOL 2110 *and* BIOL 2110L
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. (Typically Offered: Fall)

WFCE 3660: Natural History of Iowa Vertebrates
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: BIOL 2110 *and* BIOL 2110L
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. (Typically Offered: Spring)

WFCE 3710: Ecological Methods
(Cross-listed with BIOL 3710).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 3120 *or* NREM 3110*;* STAT 1010 *or* STAT 1040
Quantitative techniques used in management of natural resources with emphasis on inventory and manipulation of habitat and animal populations. (Typically Offered: Fall)

WFCE 3720: Wildlife Population Methods
Credits: 4. Contact Hours: Lecture 1, Laboratory 8.
Prereq: BIOL 3120 *or* NREM 3110
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. (Typically Offered: Summer)

WFCE 3750: Marine Ecology and Ecosystems Dynamics
(Cross-listed with ENSCI 3750/ BIOL 3750).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 2110
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. (Typically Offered: Spring)

WFCE 4060: Wildlife Camp
Credits: 3. Contact Hours: Lecture 1, Laboratory 6.
Prereq: BIOL 2110 *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. (Typically Offered: Fall)

WFCE 4150: Ecology of Freshwater Invertebrates, Plants, and Algae
(Dual-listed with WFCE 5150).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 3120
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. (Typically Offered: Fall)

WFCE 4180: Stream Ecology
(Dual-listed with WFCE 5180/ ENSCI 5180). (Cross-listed with ENSCI 4180).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 4860
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. Offered odd-numbered years. (Typically Offered: Fall)

WFCE 4250: Aquatic Insects
(Dual-listed with ENT 5250/ WFCE 5250). (Cross-listed with ENT 4250).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: BIOL 3120
Morphology, ecology, diversity, and significance of aquatic insects, with emphasis on the collection, curation and identification of taxa in local streams and lakes. Offered odd-numbered years. (Typically Offered: Spring)

WFCE 4350: Entomology Field Trip
(Cross-listed with ENT 4350).
Credits: 2. Repeatable, maximum of 2 credits.
Prereq: BIOL 3120*; Permission of Instructor*
Field trip to study insects of major terrestrial and aquatic ecosystems. Location and duration vary. ENT 3700 or ENT 4250 recommended. Offered irregularly. (Typically Offered: Spring, Summer)

WFCE 4400: Fishery Management
(Dual-listed with WFCE 5400).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 3120*,* WFCE 3210*,* WFCE 3330*;* STAT 1010 *or* STAT 1040*; Credit or Enrollment in* WFCE 4860
Biological basis of fishery management, fishery problems, and management practices for freshwater, anadromous, and marine fisheries. (Typically Offered: Fall)

WFCE 4420: Aquaculture
(Dual-listed with WFCE 5420).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 2110 *and* BIOL 2120
Concepts related to the culture of aquatic organisms including culture systems, water quality, nutrition, genetics, diseases, and marketing. (Typically Offered: Spring)

WFCE 4510: Wildlife Ecology and Management
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
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. (Typically Offered: Spring)

WFCE 4540: Principles of Wildlife Disease
(Dual-listed with WFCE 5540).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Junior standing and at least 10 credits in biological sciences at the 3000+ 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. (Typically Offered: Spring)

WFCE 4550: International Wildlife Issues
Credits: 3. Contact Hours: Lecture 3.
Prereq: WFCE 3650*,* WFCE 3120 *or Graduate classification and* NREM 1200
Biological, political, social, and economic factors affecting the management of international wildlife resources. Meets International Perspectives Requirement. (Typically Offered: Fall)

WFCE 4570: Herpetology
(Cross-listed with BIOL 4570).
Credits: 2. Contact Hours: Lecture 2.
*Prereq: (*BIOL 3510 *and* BIOL 3510L*) or (*BIOL 3650 *or* WFCE 3650*)*
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. (Typically Offered: Fall)

WFCE 4570L: Herpetology Laboratory
(Cross-listed with BIOL 4570L).
Credits: 1. Contact Hours: Laboratory 3.
*Prereq: (*BIOL 3510 *and* BIOL 3510L*) or (*BIOL 3650/WFCE 3650*) and Concurrent Enrollment in* BIOL 4570/WFCE 4570
Laboratory to accompany Biology/Animal Ecology 4570. Focus on survey methods, identification, relationships, distribution, habits, and habitats of amphibians and reptiles. (Typically Offered: Fall)

WFCE 4580: Ornithology
(Cross-listed with BIOL 4580).
Credits: 2. Contact Hours: Lecture 2.
*Prereq: (*BIOL 3510 *and* BIOL 3510L*) or (*BIOL 3650 *or* WFCE 3650*)*
Biology, evolution, ecology and taxonomy of birds. Emphasis on structure, physiology, behavior, communication, navigation, reproduction, and conservation. (Typically Offered: Spring)

WFCE 4580L: Ornithology Laboratory
(Cross-listed with BIOL 4580L).
Credits: 1. Contact Hours: Laboratory 3.
*Prereq: (*BIOL 3510 *and* BIOL 3510L*) or (*BIOL 3650/WFCE 3650*) and Credit or Concurrent Enrollment in* BIOL 4580/WFCE 4580
Laboratory complements lecture topics with emphasis on external anatomy, identification and distribution of Midwest birds, and field trips. (Typically Offered: Spring)

WFCE 4590: Mammalogy
(Cross-listed with BIOL 4590).
Credits: 2. Contact Hours: Lecture 2.
*Prereq: (*BIOL 3510 *and* BIOL 3510L*) or (*BIOL 3650 *or* WFCE 3650*)*
Biology, ecology, and evolution of mammals. Emphasis on structure, physiological adaptation to different environments, behavior, reproduction, roles of mammals in ecosystems, and conservation. (Typically Offered: Spring)

WFCE 4590L: Mammalogy Laboratory
(Cross-listed with BIOL 4590L).
Credits: 1. Contact Hours: Laboratory 3.
*Prereq: (*BIOL 3510 *and* BIOL 3510L*) or (*BIOL 3650/WFCE 3650*) and Concurrent Enrollment in* BIOL 4590/WFCE 4590
Laboratory focus on identification, survey methods, distribution, habits, and habitats of mammals. Several field trips. (Typically Offered: Spring)

WFCE 4710: Introductory Conservation Biology
(Cross-listed with BIOL 4710).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 3120
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. (Typically Offered: Spring)

WFCE 4800: Studies in Marine Biology
Credits: 1-8. Contact Hours: Lecture 8.
Repeatable.
Courses taken at Gulf Coast Research Laboratory and other marine biological stations are transferred to Iowa State University under this number. (Typically Offered: Summer)

WFCE 4860: Aquatic Ecology
(Dual-listed with WFCE 5860/ EEOB 5860/ ENSCI 5860/ EEB 5860).
(Cross-listed with ENSCI 4860/ BIOL 4860).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 3120 *or* ENSCI 3190 *or* ENSCI 4020 *or* NREM 3010
Structure and function of aquatic ecosystems with application to fishery and pollution problems. Emphasis on lacustrine, riverine, and wetland ecology. (Typically Offered: Fall)

WFCE 4860L: Aquatic Ecology Laboratory
(Dual-listed with WFCE 5860L/ EEOB 5860L/ ENSCI 5860L). (Cross-listed with ENSCI 4860L/ BIOL 4860L).
Credits: 1. Contact Hours: Laboratory 3.
Prereq: Credit or concurrent enrollment in BIOL 4860
Field trips and laboratory exercises to accompany 4860. Hands-on experience with aquatic research and monitoring techniques and concepts. (Typically Offered: Fall)

WFCE 4890: Population Ecology
(Dual-listed with WFCE 5890/ EEOB 5890/ EEB 5890). (Cross-listed with BIOL 4890).
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
Prereq: BIOL 3120*; (*STAT 1010 *or* STAT 1040*); (*MATH 1510*, 1600, 1650 or Graduate standing)*
Concepts and theories of population dynamics with emphasis on models of growth, predation, competition, and regulation. Offered even-numbered years. (Typically Offered: Fall)

Courses primarily for graduate students, open to qualified undergraduates:

WFCE 5150: Ecology of Freshwater Invertebrates, Plants, and Algae
(Dual-listed with WFCE 4150).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 3120 *or graduate standing*
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. (Typically Offered: Fall)

WFCE 5160: Avian Ecology
Credits: 3. Contact Hours: Lecture 3.
Prereq: WFCE 3650*;* WFCE 3120*; or graduate standing*
Current topics and theories including avian breeding and foraging ecology, population biology, community structure, habitat selection, field methodologies, and data interpretation. Offered even-numbered years. (Typically Offered: Spring)

WFCE 5180: Stream Ecology
(Dual-listed with WFCE 4180/ ENSCI 4180). (Cross-listed with ENSCI 5180).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 4860*; or graduate standing*
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. Offered odd-numbered years. (Typically Offered: Fall)

WFCE 5200: Fisheries Science
Credits: 3. Contact Hours: Lecture 3.
Prereq: WFCE 3120*;* WFCE 3210*; or graduate standing*
Concepts, approaches, and techniques for assessment of recreational and commercial fisheries. Scope will range from individual fish to entire ecosystems, both freshwater and marine. Offered odd-numbered years. (Typically Offered: Spring)

WFCE 5250: Aquatic Insects
(Dual-listed with ENT 4250/ WFCE 4250). (Cross-listed with ENT 5250).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: BIOL 3120 *or graduate standing*
Morphology, ecology, diversity, and significance of aquatic insects, with emphasis on the collection, curation and identification of taxa in local streams and lakes. Offered odd-numbered years. (Typically Offered: Spring)

WFCE 5310: Conservation Biolgy
(Cross-listed with EEOB 5310).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 3120*,* BIOL 3130*; 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. Offered even-numbered years. (Typically Offered: Spring)

WFCE 5400: Fishery Management
(Dual-listed with WFCE 4400).
Credits: 3. Contact Hours: Lecture 2, Laboratory 3.
Prereq: WFCE 3120*;* WFCE 3210*;* WFCE 3330*; (*STAT 1010 *or* STAT 1040*); credit or enrollment in* WFCE 4860 *or graduate standing*
Biological basis of fishery management, fishery problems, and management practices for freshwater, anadromous, and marine fisheries. (Typically Offered: Fall)

WFCE 5420: Aquaculture
(Dual-listed with WFCE 4420).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 2110*;* BIOL 2120 *or graduate standing*
Concepts related to the culture of aquatic organisms including culture systems, water quality, nutrition, genetics, diseases, and marketing. (Typically Offered: Spring)

WFCE 5510: Behavioral Ecology
Credits: 3. Contact Hours: Lecture 2, Laboratory 2.
*Prereq: (*BIOL 3120 *or* NREM 3110 *or* BIOL 3540 *or* ANS 3360 *or* ANTHR 3170*) or graduate classification*
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. Offered odd-numbered years. (Typically Offered: Fall)

WFCE 5540: Principles of Wildlife Disease
(Dual-listed with WFCE 4540).
Credits: 3. Contact Hours: Lecture 3.
Prereq: Graduate Standing or Permission of Instructor
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. (Typically Offered: Spring)

WFCE 5860: Aquatic Ecology
(Dual-listed with WFCE 4860/ BIOL 4860/ ENSCI 4860). (Cross-listed with ENSCI 5860/ EEOB 5860).
Credits: 3. Contact Hours: Lecture 3.
Prereq: BIOL 3120 *or ENSCI 3810 or* ENSCI 4020 *or* NREM 3010 *or graduate classification*
Structure and function of aquatic ecosystems with application to fishery and pollution problems. Emphasis on lacustrine, riverine, and wetland ecology. (Typically Offered: Fall)

WFCE 5860L: Aquatic Ecology Laboratory
(Dual-listed with WFCE 4860L/ BIOL 4860L/ ENSCI 4860L). (Cross-listed with ENSCI 5860L/ EEOB 5860L).
Credits: 1. Contact Hours: Laboratory 3.
Prereq: Concurrent enrollment in BIOL 4860.
Field trips and laboratory exercises to accompany 4860. Hands-on experience with aquatic research and monitoring techniques and concepts. (Typically Offered: Fall)

WFCE 5890: Population Ecology
(Dual-listed with WFCE 4890/ BIOL 4890). (Cross-listed with EEOB 5890).
Credits: 3. Contact Hours: Laboratory 2, Lecture 2.
Prereq: BIOL 3120*, (*STAT 1010 *or* STAT 1040*), (*MATH 1510*,* MATH 1600*, or* MATH 1650*) or Graduate Classification*
Concepts and theories of population dynamics with emphasis on models of growth, predation, competition, and regulation. Offered even-numbered years. (Typically Offered: Fall)

WFCE 5990: Creative Component
Credits: 1-30. Repeatable.
Prereq: Instructor Permission for Course
Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring, Summer)

Courses for graduate students:

WFCE 6110: Analysis of Populations
Credits: 3. Contact Hours: Lecture 3.
*Prereq: (*BIOL 3120*;* STAT 5101*;* MATH 1510 *or 1600 or 1650) or graduate classification*
Quantitative techniques for analyzing vertebrate population data to estimate parameters such as density and survival. Emphasis on statistical inference and computing. Offered even-numbered years. (Typically Offered: Fall)

WFCE 6980: Animal Ecology Teaching Practicum
Credits: 1-3. Repeatable.
Prereq: Instructor Permission for Course
Graduate student experience in the animal ecology teaching program. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring, Summer)

WFCE 6990: Research
Credits: 1-30. Repeatable.
Prereq: Instructor Permission for Course
Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring, Summer)