

IOWA LAKESIDE LABORATORY (IA LL)

Courses primarily for undergraduates:

IA LL 293: Natural History Workshop

Cr. 1-2. SS.

Offered as demand warrants. Five-day-long, nontechnical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 293G: Prairies

Cr. 1-2. SS.

Offered as demand warrants. Five-day-long, nontechnical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 302: Plant-Animal Interactions

Cr. 4. Alt. SS., offered odd-numbered years.

Prereq: One course in the biological sciences

Introduction to ecology and co-evolution of plants and animals; emphasis on dispersal, pollination, and plant-herbivore interactions; field and laboratory work, reading, discussion.

IA LL 303I: Undergraduate Internships

(Cross-listed with NREM). Cr. 1-5. SS.

Prereq: Permission of instructor and sophomore standing

Placement with county conservation boards, camps, parks, etc. for experience as interpreters, rangers, and technicians.

IA LL 312I: Ecology

(Cross-listed with A ECL, ENSCI). 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.

IA LL 326I: Ornithology

(Cross-listed with A ECL). Cr. 4. 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.

IA LL 333: Animals and Their Ecosystems

(4-0) Cr. 4.

Prereq: Introductory biology

Vertebrate and invertebrate animals of the Midwest are observed in nature either through passive observational techniques or active trapping exercises. Once identified, animals are placed in their proper taxonomic position (e.e., put onto the "Tree of Life"). They also are put into ecological perspective, including habitat preferences (i.e., wetland, lake, prairie, forest, river, edge), trophic position, and activity patterns. Conservation status is discussed.

IA LL 364: Biology of Aquatic Plants

Cr. 4. Alt. SS., offered even-numbered years.

A field-oriented introduction to the taxonomy and ecology of aquatic plants in lakes, wetlands and rivers. Individual or group projects.

IA LL 367: Plant Taxonomy

Cr. 4. SS.

Principles of classification and evolution of vascular plants; taxonomic tools and collection techniques; use of keys. Field and laboratory studies emphasizing identification of local flowering plants and recognition of major plant families.

IA LL 371I: Introduction to Insect Ecology

(Cross-listed with ENT). (3-3) Cr. 4. Alt. SS., offered odd-numbered years.

Field and laboratory study of insects, their diversity, life history; emphasis on ecology and behavior.

IA LL 401: Freshwater Algae

(Dual-listed with IA LL 501). Cr. 4. SS.

Structure and taxonomy of freshwater algae based on field collected material; emphasis on genus-level identifications, habitats visited include lakes, fens, streams, and rivers; algal ecology.

IA LL 402I: Watershed Hydrology and Surficial Processes

(Cross-listed with AGRON, ENSCI). Cr. 4. SS.

Prereq: Four courses in physical or biological sciences or engineering

Effects of geomorphology, soils, and land use on transport of water and materials (nutrients, contaminants) in watersheds. Fieldwork will emphasize investigations of the Iowa Great Lakes watershed.

IA LL 403: Evolution

Cr. 4. SS.

Mechanisms and patterns in microevolution and macroevolution. Field exercises will emphasize studies of natural selection, adaptation, genetic variation, and population genetics of local plant and animal populations.

IA LL 404I: Behavioral Ecology

(Cross-listed with A ECL). 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.

IA LL 415: Freshwater Invertebrates

Cr. 4. SS.

Prereq: One or more ecology courses

Field-oriented introduction to the identification, life-history, and ecology of common, free-living freshwater invertebrates of north-temperate lakes, rivers, and wetlands. Emphasis on the role of invertebrates in aquatic food chains and litter processing.

IA LL 419I: Vertebrate Ecology and Evolution

(Cross-listed with A ECL). 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.

IA LL 420I: Amphibians and Reptiles

(Cross-listed with A ECL). Cr. 4. 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.

IA LL 422I: Prairie Ecology

(Cross-listed with ENSCI). Cr. 4. SS.

Prereq: Familiarity with basic principles in biological sciences and ecology

Basic patterns and underlying physical and biotic causes of both regional and local distributions of plants and animals of North American prairies; field and laboratory analyses and projects.

IA LL 425I: Aquatic Toxicology and Wetland Dynamics in Freshwater Systems

Cr. 4. SS.

Prereq: Introductory biology course and general chemistry course

Fundamental knowledge and understanding of the scientific concepts related to the physio-chemical and biological environment. Problems and issues (global, national, regional, and local) associated with freshwater systems and how wetland restoration can be used to ameliorate problems. Discussion and application of basic tools used to assess aquatic toxicological problems.

IA LL 427I: Field Archaeology

(Cross-listed with ANTHR). Cr. 4. SS.

Nature of cultural and environmental evidence in archaeology and how they are used to model past human behavior and land use; emphasis on Iowa prehistory; basic reconnaissance surveying and excavation techniques.

IA LL 435I: Illustrating Nature I Sketching

(Cross-listed with BPM I). Cr. 2. SS.

Sketching plants, animals and terrain. Visual communication, development of a personal style, and integration of typographic and visual elements on a page will be emphasized.

IA LL 436I: Illustrating Nature II Photography

(Cross-listed with BPM I). Cr. 2. SS.

Beginning to intermediate technical and compositional aspects of color photography of natural areas and their plants and animals.

IA LL 450: Topics in Ecology and Sustainability

(Dual-listed with IA LL 550). Cr. 1-4.

Prereq: general biology course

Scientific introduction to ecology and evolution of important groups of organisms: algae to vertebrates, different ecological phenomena (e.g., fire and climate change), varying landforms, different ecosystems (e.g., prairies and aquatic systems); emphasis on sustainability with introduction to concepts, issues, and practices; ability to communicate environmental information through a variety of means.

IA LL 450A: Topics in Ecology and Sustainability: Ethnobotany

(Dual-listed with IA LL 550A). Cr. 1-4.

Prereq: general biology course

Ethnobotany is the study of how people use plants, so it is the intersection of two distinct disciplines: Plant Biology (Botany) and Anthropology. This field is a subset of the study of humans using other organisms (not just plants) for material, cultural, and spiritual uses, a subject known as Ethnobiology.

IA LL 450B: Topics in Ecology and Sustainability: Acoustic Ecology

(Dual-listed with IA LL 550B). Cr. 1-4.

Prereq: general biology course

Introduction to acoustic ecology. Field studies, lectures and assignments will work to build a strong understanding of the role sound plays in the environment. Acoustic Ecology studies the relationship between living things and their surrounding soundscape. Throughout this course, students will explore a variety of tactics for exploring, documenting and analyzing the soundscape at a various locations surrounding Lake Okoboji and beyond. Studying the soundscape crosses into a variety of disciplines and topics. There are issues relating to biology, audio engineering, acoustics, community development, social engagement, design, art, health and many, many more. While some portion of this course will discuss art and design as it relates to the study of acoustic ecology, no previous art or design knowledge is required to successfully complete this course.

IA LL 450C: Topics in Ecology and Sustainability: Environmental Writing

(Dual-listed with IA LL 550C). Cr. 1-4.

Prereq: general biology course

The Environmental Imagination in Creative Writing: A Multi-Genre Workshop.

IA LL 450D: Topics in Ecology and Sustainability: Epidemiology as Ecology

(Dual-listed with IA LL 550D). Cr. 1-4.

Prereq: general biology course

Relationships between population ecology and human health. Important topics that will be explored include the intersection of the ecology of organisms and human health, how humans interact with biological and physical environments in ways that promote or harm human health, and how threats to human health are assessed and monitored. The course is "learning by doing"—field-based, individually tailored to student interests, and appropriate for students in the natural sciences, health sciences, or public health sciences. Course activities include field trips, field data collection and analysis, and student-led research projects and presentations.

IA LL 450E: Topics in Ecology and Sustainability: Lichen Diversity

(Dual-listed with IA LL 550E). Cr. 1-4.

Prereq: general biology course

Discover and appreciate the beauty and diversity of local lichen species, while learning to identify these organisms.

IA LL 450F: Topics in Ecology and Sustainability: Ecology of Algal Blooms

(Dual-listed with IA LL 550F). Cr. 1-4.

Prereq: general biology course

Ecological mechanisms that trigger and maintain blooms in aquatic ecosystems, as well as the physiological advantages that allow some species to bloom while others do not, with emphasis on Cyanobacteria. This intensive course will combine discussion of primary literature, applied field sampling techniques, species level taxonomic identification and physiological characterization (stable isotope or toxin analyses) of local bloom-forming taxa.

IA LL 450G: Topics in Ecology and Sustainability: Biological Illustration

(Dual-listed with IA LL 550G). Cr. 1-4.

Prereq: general biology course

Introduction to biological illustration by way of field sketching natural history on-site. Emphasis is placed on observation, visual data collection, annotated field sketching, and the research process in preparation for final illustration projects. Students will become acquainted with an array of rendering techniques and visual conventions for scientific illustration.

IA LL 461I: Introduction to GIS

(Cross-listed with ENSCI, ENV S, L A). Cr. 4. SS.

Descriptive and predictive GIS modeling techniques, spatial statistics, and map algebra. Application of GIS modeling techniques to environmental planning and resource management.

IA LL 463I: Soil Formation and Landscape Relationships

(Dual-listed with IA LL 563I). (Cross-listed with AGRON, ENSCI). Cr. 4. Alt. SS., offered even-numbered years.

Prereq: AGRON 154 or AGRON 260

Relationships between soil formation, geomorphology, and environment. Soil description, classification, geography, mapping, and interpretation for land use. Credit for only Agron 563 or 563I may be applied for graduation.

IA LL 480I: Ecology and Systematics of Diatoms

(Dual-listed with IA LL 580I). Cr. 4. SS.

Field and laboratory study of freshwater diatoms; techniques in collection, preparation, and identification of diatom samples; study of environmental factors affecting growth, distribution, taxonomic characters; project design and execution including construction of reference and voucher collections and data organization and analysis.

IA LL 484: Plant Ecology

Cr. 4. SS.

Principles of plant population, community, and ecosystem ecology illustrated through studies of native vegetation in local prairies, wetlands and forests. Group or individual projects.

IA LL 490I: Iowa Lakeside Laboratory

(Cross-listed with ANTHR, NREM). Cr. 1-6. Repeatable, maximum of 9 credits.

Prereq: 8 credits in biology and permission of instructor

Research opportunities for undergraduate students in the biological sciences. No more than 9 credits in Biol 490 may be counted toward graduation and of those, only 6 credits may be applied to the major.

IA LL 493: Natural History Workshop

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493A: Amphibians and Reptiles

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493B: Birds and Birding

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493C: Nature Photography

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493D: Mushrooms and Other Fungi

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493E: Iowa's Trees and Forests

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493F: Fish Biology

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493G: Prairies

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493I: Common Insects

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493J: Aquatic Plants

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493K: Life in Rivers

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493L: Life in Lakes

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493M: Mosses and Liverworts

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493N: Natural History of Iowa Great Lakes Region

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493P: Field Archaeology

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493Q: Common Algae

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493S: Scuba Diving

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493T: Astronomy

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 493U: Sketching Nature

Cr. 1-2. SS.

Offered as demand warrants. Five day-long, non-technical introductions to a specific aspect of the natural history of the Upper Midwest or techniques for studying natural history.

IA LL 494: Ecosystems of North America

Cr. 2-4. SS.

Prereq: A general ecology course and permission of the instructor

An extended field trip to study a particular type of ecosystem (prairie, coastal wetland, forest, alpine, coral reefs, etc.) or the ecosystems of a specific region (Rocky Mountains, Gulf Coast, Appalachian Mountains, Deserts of the Southwest, Central America, etc.). Prior to the field trip, there will be an orientation period and after each field trip a review and synthesis period. A field trip fee will be assessed to cover travel expenses.

IA LL 499: Undergraduate Research

Cr. 1-4.

Prereq: Junior or senior classification and permission of instructor

Courses primarily for graduate students, open to qualified undergraduates:

IA LL 501: Freshwater Algae

(Dual-listed with IA LL 401). Cr. 4. SS.

Structure and taxonomy of freshwater algae based on field collected material; emphasis on genus-level identifications, habitats visited include lakes, fens, streams, and rivers; algal ecology.

IA LL 503: Graduate Internships

Cr. 1-5. SS.

Prereq: Permission of instructor and graduate standing

Placement with county conservation boards, camps, parks, schools, etc. for experience as interpreters, rangers, technicians, and teachers.

IA LL 508I: Aquatic Ecology

(Cross-listed with ENSCI, NREM). Cr. 4. SS.

Prereq: Courses in ecology, chemistry, and physics

Analysis of aquatic ecosystems; emphasis on basic ecological principles; ecological theories tested in the field; identification of common plants and animals.

IA LL 523I: Fish Ecology

(Cross-listed with A ECL). Cr. 4. 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.

IA LL 526I: Advanced Field Ornithology

(Cross-listed with A ECL). 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.

IA LL 531I: Conservation Biology

(Cross-listed with A ECL, EE0B). 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.

IA LL 532: Analysis of Environmental Data

(2-0) Cr. 2. SS.

Prereq: An undergraduate course in statistics, understanding of basic concepts such as correlation and regression, and familiarity with PC-based software for data analysis

Analysis of Environmental Data will provide students with training in the theory and application of a range of statistical techniques useful for the analysis of ecological and paleoecological data. Topics will include data management, exploratory data analysis, regression analysis, direct and indirect ordination methods, classification techniques, transfer functions and the analysis of temporal data. Practical classes will provide hands-on training in the use of statistical and graphical software including R, CANOCO, C2, and TWINSpan. The course will be directed towards advanced undergraduate, graduate and working professionals in ecology and paleoecology.

IA LL 535I: Restoration Ecology

(Cross-listed with A ECL, EE0B, ENSCI). Cr. 4. 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.

IA LL 550: Topics in Ecology and Sustainability

(Dual-listed with IA LL 450). Cr. 1-4.

Prereq: general biology course

Scientific introduction to ecology and evolution of important groups of organisms: algae to vertebrates, different ecological phenomena (e.g., fire and climate change), varying landforms, different ecosystems (e.g., prairies and aquatic systems); emphasis on sustainability with introduction to concepts, issues, and practices; ability to communicate environmental information through a variety of means.

IA LL 550A: Topics in Ecology and Sustainability: Ethnobotany

(Dual-listed with IA LL 450A). Cr. 1-4.

Prereq: general biology course

Ethnobotany is the study of how people use plants, so it is the intersection of two distinct disciplines: Plant Biology (Botany) and Anthropology. This field is a subset of the study of humans using other organisms (not just plants) for material, cultural, and spiritual uses, a subject known as Ethnobiology.

IA LL 550B: Topics in Ecology and Sustainability: Acoustic Ecology

(Dual-listed with IA LL 450B). Cr. 1-4.

Prereq: general biology course

Introduction to acoustic ecology. Field studies, lectures and assignments will work to build a strong understanding of the role sound plays in the environment. Acoustic Ecology studies the relationship between living things and their surrounding soundscape. Throughout this course, students will explore a variety of tactics for exploring, documenting and analyzing the soundscape at a various locations surrounding Lake Okoboji and beyond. Studying the soundscape crosses into a variety of disciplines and topics. There are issues relating to biology, audio engineering, acoustics, community development, social engagement, design, art, health and many, many more. While some portion of this course will discuss art and design as it relates to the study of acoustic ecology, no previous art or design knowledge is required to successfully complete this course.

IA LL 550C: Topics in Ecology and Sustainability: Environmental Writing

(Dual-listed with IA LL 450C). Cr. 1-4.

Prereq: general biology course

The Environmental Imagination in Creative Writing: A Multi-Genre Workshop.

IA LL 550D: Topics in Ecology and Sustainability: Epidemiology as Ecology

(Dual-listed with IA LL 450D). Cr. 1-4.

Prereq: general biology course

Relationships between population ecology and human health. Important topics that will be explored include the intersection of the ecology of organisms and human health, how humans interact with biological and physical environments in ways that promote or harm human health, and how threats to human health are assessed and monitored. The course is "learning by doing"—field-based, individually tailored to student interests, and appropriate for students in the natural sciences, health sciences, or public health sciences. Course activities include field trips, field data collection and analysis, and student-led research projects and presentations.

IA LL 550E: Topics in Ecology and Sustainability: Lichen Diversity

(Dual-listed with IA LL 450E). Cr. 1-4.

Prereq: general biology course

Discover and appreciate the beauty and diversity of local lichen species, while learning to identify these organisms.

IA LL 550F: Topics in Ecology and Sustainability: Ecology of Algal Blooms

(Dual-listed with IA LL 450F). Cr. 1-4.

Prereq: general biology course

Ecological mechanisms that trigger and maintain blooms in aquatic ecosystems, as well as the physiological advantages that allow some species to bloom while others do not, with emphasis on Cyanobacteria. This intensive course will combine discussion of primary literature, applied field sampling techniques, species level taxonomic identification and physiological characterization (stable isotope or toxin analyses) of local bloom-forming taxa.

IA LL 550G: Topics in Ecology and Sustainability: Biological Illustration

(Dual-listed with IA LL 450G). Cr. 1-4.

Prereq: general biology course

Introduction to biological illustration by way of field sketching natural history on-site. Emphasis is placed on observation, visual data collection, annotated field sketching, and the research process in preparation for final illustration projects. Students will become acquainted with an array of rendering techniques and visual conventions for scientific illustration.

IA LL 563I: Soil Formation and Landscape Relationships

(Dual-listed with IA LL 463I). (Cross-listed with AGRON, ENSCI). Cr. 4. Alt. SS., offered even-numbered years.

Prereq: AGRON 154 or AGRON 260

Relationships between soil formation, geomorphology, and environment. Soil description, classification, geography, mapping, and interpretation for land use. Credit for only Agron 563 or 563I may be applied for graduation.

IA LL 564I: Wetland Ecology

(Cross-listed with EEOB, ENSCI). Cr. 4. SS.

Prereq: Ia LL 312I

Ecology, classification, creation, restoration, and management of wetlands. Field studies will examine the composition, structure and functions of local natural wetlands and restored prairie pothole wetlands. Individual or group projects.

IA LL 573: Techniques for Biology Teaching

(Cross-listed with A ECL, EEOB). 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.

IA LL 573A: Techniques for Biology Teaching : Animal Biology

(Cross-listed with A ECL, EEOB). 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.

IA LL 573B: Techniques for Biology Teaching: Plant Biology

(Cross-listed with EEOB). 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.

IA LL 573C: Techniques for Biology Teaching: Fungi and Lichens

(Cross-listed with EEOB). 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.

IA LL 573D: Techniques for Biology Teaching: Aquatic Ecology

(Cross-listed with EEOB). 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.

IA LL 573E: Techniques for Biology Teaching: Prairie Ecology

(Cross-listed with EEOB). 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.

IA LL 573F: Techniques for Biology Teaching: Wetland Ecology

(Cross-listed with EEOB). 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.

IA LL 573G: Techniques for Biology Teaching: Limnology

(Cross-listed with A ECL, EEOB). 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.

IA LL 573H: Techniques for Biology Teaching: Animal Behavior

(Cross-listed with EEOB). 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.

IA LL 573I: Techniques for Biology Teaching: Insect Ecology

(Cross-listed with A ECL, EEOB). 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.

IA LL 573J: Techniques for Biology Teaching: Biology of Invertebrates

(Cross-listed with EEOB). 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.

IA LL 573K: Techniques for Biology Teaching: Non-invasive Use of Living Organisms

(Cross-listed with EEOB). 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.

IA LL 573W: Techniques for Biology Teaching: Project WET

(Cross-listed with A ECL, EEOB). 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.

IA LL 575I: Field Mycology

(Cross-listed with EEOB). Cr. 4. Alt. SS., offered even-numbered years.

Identification and classification of the common fungi; techniques for identification, preservation, and culture practiced with members of the various fungi groups.

IA LL 580I: Ecology and Systematics of Diatoms

(Dual-listed with IA 480I). (Cross-listed with EEOB). Cr. 4. SS.

Field and laboratory study of freshwater diatoms; techniques in collection, preparation, and identification of diatom samples; study of environmental factors affecting growth, distribution, taxonomic characters; project design and execution including construction of reference and voucher collections and data organization and analysis.

IA LL 590: Graduate Independent Study

(Cross-listed with A ECL, ANTHR, EEOB). Cr. 1-4. Repeatable. SS.

Prereq: Graduate classification and permission of instructor

IA LL 590I: Special Topics: Graduate Independent Study

(Cross-listed with A ECL, ANTHR, EEOB). Cr. 1-4. Repeatable. SS.

Prereq: Graduate classification and permission of instructor

IA LL 593: Natural History Workshop

Cr. 1-3.

Prereq: Permission of instructor

Graduate workshop on some aspect of the natural history of the Upper Midwest or on techniques for studying natural history.

Courses for graduate students:

IA LL 699I: Research

(Cross-listed with A ECL, ANTHR, EEOB, GDCB). Cr. 1-4. Repeatable.