

IOWA LAKESIDE LABORATORY

Descriptions of 2014 Courses Open to High School Students

Enrollment of High School Students is Dependent on Instructor Approval. Please contact instructor before enrolling.

Aquatic Ecology 00L:103:EX1 (IALL:3103)

In this course, students will study the ecological principles of aquatic ecosystems at the population, community, and ecosystem levels. The course is divided into two 2-week sections which can also be taken independently as stand-alone sections. The first half focuses on the ecology of wetlands and streams with an emphasis on faunal and floral diversity. The second half will focus on limnology, the study of lakes. Students will investigate how physical and chemical environments of aquatic ecosystems affect the distribution and composition of aquatic biota, and vice versa. Lectures will cover such topics as the origins of lakes and their global distribution, biogeochemical nutrient cycling, phytoplankton and zooplankton ecology, and management of aquatic ecosystems, including wetland delineation and regulation. This course will have a strong field and laboratory component, in which students will learn field techniques and laboratory analyses commonly used by aquatic ecologists. For example, students will learn to sample and identify common plants and animals of streams and wetlands including use as indicators of environmental conditions, the relationship of hydrologic and soil conditions to flora & fauna, methods to measure underwater light climate and mixing regimes of lakes; nitrogen and phosphorus analytical techniques; phytoplankton, zooplankton, and macroinvertebrate identification and enumeration techniques; and measures of community metabolism in aquatic ecosystems. Students will also learn statistical analyses, interpretation of ecological data, and writing of scientific manuscripts through independent group research projects. Meets **May 19-June 13, 2014**.

No textbooks are required for this course.

Prerequisite: Introductory coursework in biology, chemistry, and/or physics or consent of the instructors, Dr. Chris Filstrup (filstrup@iastate.edu) and Dr. Paul Weihe (WeiheP@central.edu).

Field trip fee: \$58

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Ecology 00L:121:EX 1 (IALL:3121)



An introduction to the evolutionary and basic principles of ecology at the organismal, population, community, and ecosystem levels. The course integrates lectures and field studies to examine factors controlling the distribution and abundance of plants and animals in native ecosystems. General topics include climate, microclimates, soil, aquatic environments, responses of organisms to environment, life history, population growth and regulation, demography, species interactions, community composition and structure, landscape ecology, trophic structure and productivity, and biogeochemical cycles. **Meets May 19 – June 13, 2014. Prerequisite:** two semesters of introductory biology or consent of the instructor. **DESCRIPTION:** There is a strong emphasis on field ecology (what do ecologists do?), meaning that students will conduct many field research

projects. These require collection, analysis, and the interpretation of data in short reports. Appropriate field clothes and supplies are needed (rain gear, warm clothing, hat, sturdy boots, sunscreen, wading shoes, and insect repellent). Ecology texts are available in the library, but if you wish to purchase one, a good choice is *Elements of Ecology* (7th edition) by Robert L. Smith and Thomas M. Smith. A required book (not available in the library or for purchase at ILL) is *Where the Wild Things Were: Life, Death, and Ecological Wreckage in a Land of Vanishing Predators* by William Stolzenburg (ISBN-13: 978-1596912991), available through internet booksellers. Purchase this before coming to ILL. Students should bring a field pack, calculator, a spiral notebook, and at least one flash drive. Optional items (suggested but not necessary) include a camera, field guides, binoculars, a water bottle, and hip or chest waders.

Field trip fee: \$53

For more information contact Professor Neal Berstein nberstein@mtmercy.edu

Topics in Ecology and Sustainability: Limnology 00L:034:EX4 (IALL:1034)

In this course, students will study the ecological principles of lake ecosystems at the population, community, and ecosystem levels. Students will investigate how physical and chemical environments of lakes affect the distribution and composition of a lake's biota, and vice versa. The course will cover both basic aspects of ecosystem functioning in lakes, as well as applied aspects of water quality in lake management. Lectures will cover such topics as physical processes of water mixing and underwater light climate, biogeochemical nutrient cycling, phytoplankton and zooplankton ecology, and lake and watershed management. This course will have a strong field and laboratory component, in which students learn field techniques and laboratory analyses commonly used by limnologists. For example, students will learn methods to measure the underwater light climate and mixing regimes of lakes; nitrogen and phosphorus analytical techniques; phytoplankton and zooplankton identification and enumeration techniques; and measures of community metabolism in pelagic communities. Students will also learn statistical analyses and interpretation of ecological data, and writing of scientific manuscripts through laboratory reports. **Meets June 2 – June 13, 2014**

No textbooks are required for this course.

Prerequisite: Introductory coursework in biology, chemistry, and/or physics or consent of the instructor Dr. Chris Filstrup (filstrup@iastate.edu)

Field trip fee: \$29

Conservation Biology 00L:163:EX1 (IALL:3163)

This four-week course uses lectures and field exercises to examine population and community level factors that influencing the viability of plant and animal populations from both demographic and genetic perspectives; assessment of biodiversity; design and management of preserves. Conservation Biology examines the history of the Upper Midwest from the retreat of the latest glaciers to the present day. Northwest Iowa is a landscape of lakes, wetlands, prairie, and oak savannah; it is also a place of intense agriculture, an area of concentrated summer tourism, and it hosts a wind farm. In this context, native ecosystems will be compared against altered ecosystems, and the processes of restoration will be

measured against these extremes. Students will participate in on-going oak savannah and lakeshore restoration projects at Iowa Lakeside Laboratory. **Meets June 16 – July 11, 2014.**

Prerequisite: two semesters of introductory biology or consent of the instructor, Dr. Michael Lannoo (mlannoo@iupui.edu)

Textbooks and Materials:

- *Principles of Conservation Biology* by Martha J. Groom, Gary K. Meffe and Carl R. Carroll Sinauer Associates ©2006
- Students should bring rugged clothing, sturdy boots, heavy canvas gloves, waders (optional—you may instead choose to get wet), and a hard hat (also optional)

Field trip fee: \$53

Ecology and Systematics of Algae 00L:109:EX1 (IALL:3109)

Biology, ecology and taxonomy of cyanobacteria and eukaryotic freshwater algae based on field collected material. Samples collected from lakes, fens, streams, and rivers will be identified mostly to genus level with some common species identifications within each algal group. **Meets June 24 to July 11, 2014.**

An ecological perspective is used to explore the diversity of photosynthetic microbes that form the energy base of freshwater ecosystems. Environmental and economic concerns caused by excessive algal growth will also be examined. Field collections will be used to identify the common phyla and genera of algae, to study their life histories, and to examine environmental factors that affect algal growth and distribution. A class project will investigate the algal ecology of Lake West Okoboji.

Prerequisites: Students should have a working knowledge of basic biology. For more information contact instructor Prof. Kalina Manoylov at kalina.manoylov@gcsu.edu

Textbook and Materials:

- The required text is ***Algae*** by L.E. Graham, J.M. Graham, and L.W. Wilcox, 2nd edition, 2009 (ISBN-13: 978-0-321-55965-4). Students choosing a career in aquatic ecology, phycology or botany are strongly encouraged to bring a copy of ***Freshwater Algae of North America, Ecology and Classification*** by J.D. Wehr and R.G. Sheath, 2003 (ISBN 0-12-741550-5).
- Appropriate field clothes, hat, sunscreen and insect repellent will be needed. Either old tennis shoes, hip boots or chest waders will be needed for sampling aquatic habitats.

Field trip fee \$23

Introduction to Prairie Ecology 00L:034:EX6 (IALL:1034)



This two-week course introduces students to concepts and techniques of prairie ecology. It includes field observations, sampling and laboratory exercises to analyze and interpret vegetation patterns and the physical and biotic basis for both regional and local distributions of plants and animals of North American prairies. Fieldwork will include learning to recognize prairie plants and the examination and investigation of various prairie communities in northwest Iowa and selected communities in southwest Minnesota. The prairie communities will be evaluated for species composition, richness, and natural quality. Sampling data will be analyzed using

standard community-analysis techniques. **Meets June 16-June 27, 2014.**

Prerequisite: two semesters of introductory biology or consent of the instructor. Prof. Daryl Smith daryl.smith@uni.edu

Textbooks and Materials

An Illustrated Guide to Iowa Prairie Plants. Paul Christian and Mark Muller. University of Iowa Press
Readings in Prairie Ecology compiled by Daryl Smith available from instructor at beginning of course

Field trip fee: \$36

Field Archeology 00L040:EX1 (IAL:1040) (Four weeks)

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; introductory reconnaissance surveying and excavation techniques. **Meets June 16 to July 11, 2014.**

The 2014 Lakeside Laboratory archaeological field school will continue on-going research efforts in the Iowa Great Lakes region including excavations at the Milford Oneota site and possibly a Woodland site at Mini-wakan State Park. Previous Lakeside Laboratory summer archaeological field schools have investigated late prehistoric/protohistoric Oneota tradition sites since 1995, recovering large assemblages of diverse materials including arrow and spear points and other stone tools, decorated ceramic sherds, copper fragments, bison bones and other faunal remains, worked catlinite, glass trade beads, and a gun flint. Features



related to semi-subterranean houses, hearths, and storage pits are preserved. Participants will be introduced to the essential methods of field archaeology including artifact identification, site mapping, excavation techniques, artifact processing, and beginning analytical methods. The field school will include lectures on Iowa Archaeology and the culture history sequence of western Iowa as well as day trips to the Sanford Museum in Cherokee, Iowa and the Dixon Oneota site, as well as the Blood Run National Historic Landmark, Jeffers Petroglyphs, and Pipestone National Monument.

Students will participate in class activities from approximately 7:45 AM to 4:30 PM M-F, with lab or lecture activities up to two evenings per week. Weekends are free for touring as desired or enjoying the fun and sun of the Iowa Great Lakes region.

Prerequisites: This is an introductory level course—no prior experience is required.

Equipment: Equipment: This is a field course so be prepared to be outside all day. Sunscreen, hat, and good footwear (no open toe sandals) are required. Excavation and surveying equipment will be provided.

Assignments: As this is primarily a field course, excavation and mapping notes as well as recording of general observations while digging will be required. Excavation and lab processing forms will also be completed by field school participants. No formal tests or writing assignments are required beyond the field notebooks (which will include building an annotated bibliography from pertinent source materials provided by the instructor).

Texts: There is **one required text** for those signing up for the full four-week session.(I recommend a used copy from Amazon.com):

Hester, Thomas R., Harry J. Shafer, and Kenneth L. Feder. 1997. *Field Methods in Archaeology*. 7th Edition. Mayfield Publishing Company, Mountain View California. [ISBN No.: 1-55934-799-6 paperback]

Field trip fee: \$64

For more information, please contact:

John F. Doershuk, Ph.D. [University of Iowa](http://www.uiowa.edu) 319/384-0751 john-doershuk@uiowa.edu

Field Archeology 00L030:EX1 (IAL:1030) (one week)

Students in this Field Archeology course will participate for one week in archeological school research projects in the Iowa Great Lakes region including excavations at the Milford Oneota site and possibly a Woodland site at Mini-wakan State Park. See Field Archeology, 00L:040, for details about previous excavations. Participants will be introduced to the essential methods of field archaeology including artifact identification, site mapping, excavation techniques, artifact processing, and beginning analytical methods. The one-week field school will include lectures on Iowa Archaeology and the culture history sequence of western Iowa as well as day trips to such locations as the Sanford Museum in Cherokee, Iowa the Dixon Oneota site, the Blood Run National Historic Landmark, Jeffers Petroglyphs, and Pipestone National Monument.

Students will participate in class activities from approximately 7:45 AM to 4:30 PM M-F, with lab or lecture activities up to two evenings per week. Weekends are free for touring as desired or enjoying the fun and sun of the Iowa Great Lakes region. **Meets June 23-June 27, 2014**

Prerequisites: This is an introductory level course—no prior experience is required.

Text: No text is required.

Equipment: Equipment: This is a field course so be prepared to be outside all day. Sunscreen, hat, and good footwear (no open toe sandals) are required. Excavation and surveying equipment will be provided.

Assignments: As this is primarily a field course, excavation and mapping notes as well as recording of general observations while digging will be required. Excavation and lab processing forms will also be completed by field school participants. No formal tests or writing assignments are required beyond the field notebooks (which will include building an annotated bibliography from pertinent source materials provided by the instructor).

For more information, please contact:

John F. Doershuk, Ph.D.

University of Iowa

319/384-0751

john-doershuk@uiowa.edu

Field Archeology 00L030:EX2 (IAL:1030) (Two weeks)

Students in this Field Archeology course will participate for two weeks in archeological school research projects in the Iowa Great Lakes region including excavations at the Milford Oneota site and possibly a Woodland site at Mini-wakan State Park. See Field Archeology, 00L:040, for details about previous excavations. Participants will be introduced to the essential methods of field archaeology including artifact identification, site mapping, excavation techniques, artifact processing, and beginning analytical methods. The one-week field school will include lectures on Iowa Archaeology and the culture history sequence of western Iowa as well as day trips to such locations as the Sanford Museum in Cherokee, Iowa the Dixon Oneota site, the Blood Run National Historic Landmark, Jeffers Petroglyphs, and Pipestone National Monument. **Meets June 30 – July 11, 2014**

Students will participate in class activities from approximately 7:45 AM to 4:30 PM M-F, with lab or lecture activities up to two evenings per week. Weekends are free for touring as desired or enjoying the fun and sun of the Iowa Great Lakes region.

Prerequisites: This is an introductory level course—no prior experience is required.

Text: No text is required.

Equipment: Equipment: This is a field course so be prepared to be outside all day. Sunscreen, hat, and good footwear (no open toe sandals) are required. Excavation and surveying equipment will be provided.

Assignments: As this is primarily a field course, excavation and mapping notes as well as recording of general observations while digging will be required. Excavation and lab processing forms will also be completed by field school participants. No formal tests or writing assignments are required beyond the field notebooks (which will include building an annotated bibliography from pertinent source materials provided by the instructor).

Field trip fee: \$32

For more information, please contact:

John F. Doershuk, Ph.D. [University of Iowa](http://www.uiowa.edu) 319/384-0751 john-doershuk@uiowa.edu

Pollination Ecology 00L:034:EX8(IALL:1034) and 00L:234:EX8 (IALL:5234)

This two-week course is intended to provide students with a working background in the area of pollination ecology. The class will consist of lectures, lab investigations, and field exercises. Field exercises will utilize nearby Cayler Prairie Reserve, one of Iowa's largest and most diverse tallgrass prairie remnants, as our own outdoor laboratory. The goal of the class is to provide students with an overview of plant and animal adaptations that together accomplish pollination. The mutualism between flowering plants and their animal pollinators is one of trickery and cheats, attractants and rewards, and intricate timing all involving a range of interactions between the plants and the estimated 200,000+ species of pollinators. Specific topics to be covered include pollinator identification, measuring pollinator abundance and diversity, ecology of pollen and nectar rewards, and threats to pollination services provided by insects. **Meets July 14 – July 25, 2014**

This class is suitable for both undergraduate and graduate students.

Textbook and Materials: No textbook is required.

For more information contact Dr. Mary Harris (maharris@iastate.edu)

Field trip fee: \$29

Epidemiology as Ecology 00L:034:EX7 (IALL:1034)

This two-week course focuses on the 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. **Meets July 14 – July 25**

This class is suitable for undergraduate students in biology, public health, environmental sciences, and engineering.

Prerequisite: two semesters of introductory biology or equivalent or consent of the instructor

Textbook and Materials: No textbook is required.

For more information contact Dr. Viktor Bovbjerg (viktor.bovbjerg@oregonst.edu)

Field trip fee: \$29

