# IOWA LAKESIDE LABORATORY (LLAB)

**LLAB 0--. LLAB-LOWER DIVISION. (1-10 Credits)**
Lower Level Coursework in Iowa Lakeside Laboratory
**Level:** Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Transfer
**Schedule type(s):** Lecture
**Area(s) of Inquiry:** None

**LLAB 1--. LLAB-UPPER DIVISION. (1-10 Credits)**
Upper Level Coursework in Iowa Lakeside Laboratory
**Level:** Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Transfer
**Schedule type(s):** Lecture
**Area(s) of Inquiry:** None

**LLAB 031. NATURAL HISTORY WORKSHOPS. (1-2 Credits)**
1 or 2 week-long non-technical introductions to a specific aspect of the natural history of the Upper Midwest or the techniques for studying natural history. Suitable for anyone who is interested in learning more about the natural world. One to two credits can be obtained for each week a workshop is taken. Courses can also be taken on a non credit basis. Availability of topics (sections) varies from year to year. Students register for specific section by the name of the topic.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 032. NATURAL HISTORY: FIELD ARCH. (1,2 Credits)**
Natural History Workshops are introductory courses suitable for anyone who is interested in learning more about the natural world. One or two credits can be obtained for each week a workshop is taken. All sections of this course can also be taken on a non-credit basis for a fee of $170 per week of class.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 043. GLACIAL GEOMORPHOLOGY. (2 Credits)**
Field-based introduction to glacial environments and processes, including the origin of sediments, landforms and landscapes produced in glacial and associated environments. Aeolian (wind) processes, river and lacustrine systems, and mechanisms and chronologies of climate change also will be covered.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Lecture/Lab Combo, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 060. ILLUSTRATING NATURE I: SKETCHING. (2 Credits)**
Introductory instruction in the sketching of plants, animals and terrain. Emphasis on approaches to visual communication, development of personal style, and integration of typographic and visual elements on a page. Examination of the basic principles associated with media and techniques used in general and scientific field sketching.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 061. ILLUSTRATING NATURE II. (2 Credits)**
Basic to intermediate instruction in the application of photography to natural landscapes, flora and fauna. Emphasis is on making artistic images in the field using three principles that contribute to the aesthetic appeal of Major topics include the basics of 35mm SLR an image - content, technique, and composition. cameras and lenses, film, exposure and tonality, filters, color, macrophotography, flash, image size, depth of elements of design, perspective and placement, field, and plant, animal and landscape photography. Lectures, field trip, slide submissions. Offered Students should have access to a 35mm SLR camera and at least one lens. No previous experience needed. spring semester of odd-numbered years.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 065. INTRODUCATION TO GIS. (4 Credits)**
Drake Equivalent: ENV 065 Introduction to geographic information technologies for natural resources application including GIS, remote sensing GPS, and cartography. Emphasis on theoretical concepts of these technologies as well as applications to real world problem solving. Technological expertise will be developed in ArcView GIS, ArcGIS, image analysis software, field collection software, and presentation software. The course will emphasize field collection of data requiring students to work individually and in groups.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 118. ECOLOGY. (4 Credits)**
Drake Equivalent: Bio 117 and Bio 118 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. An emphasis on field research, especially data collection and statistical analyses, that explain the relationships between organisms and their environment.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 001 or BIO 012)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 119. AMPHIBIANS AND REPTILES. (4 Credits)**
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 130. ORNITHOLOGY. (4 Credits)**
Biology, ecology, and behavior of birds; emphasis on field studies of local avifauna; group projects with focus on techniques of population analysis and methodology for population studies.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** BIO 013 and BIO 013L
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Lab, Lecture, Off-campus catalog credit
**Area(s) of Inquiry:** None

**LLAB 141. TECHNIQUES/BIO TEACHING. (1-2 Credits)**
The development and implementation of laboratory exercises suitable for inclusion in elementary, middle school, high school, and community college biology and environmental courses. Exercises will be built around common organisms and ecosystems in Iowa. Prerequisites: Must be a veteran or a newly certified middle school, high school, or community college biology teacher.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 152. PLANT TAXONOMY. (4 Credits)**
Plant Taxonomy integrates three subject areas in botany – 1) taxonomy, 2) evolution, and 3) natural history and ecology. It will develop the skills and knowledge necessary to identify plants in the field, to form an evolutionary paradigm for the Plant Kingdom, and to build understanding of the natural history and biology of common plant species. Taxonomy is the primary objective, and will address several goals: a) sight identification of 100 or more commonly encountered species b) sight identification of 25 plant families c) knowledge of descriptive botanical terminology d) proficiency in using plant keys to identify species e) application of techniques for plant collection and voucher preparation f) understanding of plant nomenclature and systematics Students are required to make a plant collection and to demonstrate an understanding of evolutionary trends and lineages, plant classification, plant species habitats and distributions, and plant adaptations and interactions. Extended field trips.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** BIO 013 and BIO 013L
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Lab, Lecture, Off-campus catalog credit
**Area(s) of Inquiry:** None

**LLAB 160. ARCHAEOLOGY. (4 Credits)**
Nature of cultural and environmental evidence in archaeology and how they are used to model past human behavior and land use with discussion on Iowa prehistory and basic reconnaissance surveying and excavation techniques. Strong emphasis on the field methods used in archaeology to excavate and study Native American cultures. An on-site excavation forms the bulk of the course activity. Additional coursework includes maintenance of a daily journal, readings, evening lectures and videos, and field trips to area museums and National Monuments.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 161. FRESHWATER ALGAE. (4 Credits)**
Structure and taxonomy (genus-level identification) of freshwater algae based on field-collected material from lakes, fens, streams, and rivers. An ecological perspective is used to explore the diversity of photosynthetic microbes that form the energy base of freshwater ecosystems. Examination of environmental and economic concerns caused by excessive algal growth. Prerequisites: BIO 1 or BIO 11
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 001 or BIO 011)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 162. BIO OF AQUATIC PLANTS. (4 Credits)**
A field-oriented introduction to the taxonomy and ecology of aquatic plants in lakes, wetlands, and rivers. Emphasis will be on use of keys and herbarium vouchers to identify plants. Field trips to wetlands (marshes, fens, sedge meadows, forested wetlands) will occur throughout the course. Major topics include the structure and use of identification keys; geomorphology and wetlands types of Iowa; characteristics of wetland plants; hydric soils, hydrology and wetland delineation; invasive wetland species; and threatened/endangered wetland plants. Prerequisite: BIO 1 or BIO 11.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 001 or BIO 011 or AP 007)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 163. ECOLOGY AND SYSTEMATICS/DIATOMS. (4 Credits)**
Field and laboratory study of freshwater diatoms. Examination of techniques used in the collection, preparation, and identification of diatom samples. Emphasis on the study of environmental factors affecting diatom growth, distribution, and taxonomic characters. A self-designed and executed student project that results in the construction of reference and voucher collections, a database, and data analysis required. Prerequisite: BIO 1 or BIO 11.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 001 or BIO 011)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 164. PRAIRIE ECOLOGY. (4 Credits)**
Examination of the ecological patterns and underlying physical and biotic causes of both regional and local distributions of plants and animals in North American prairies. Emphasis on fieldwork that investigates the species composition of various prairie communities in northwest Iowa. A six-day field trip to the Badlands and Wind Cave National Parks in South Dakota and the Sandhills of Nebraska is required. Prerequisite: BIO 118.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 118)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 168. AQUATIC ECOLOGY. (4 Credits)**
Analysis of aquatic ecosystems with emphasis on basic ecological principles and data collection to test ecological theories in the field. Examination of the physical, chemical and biological processes in lakes and wetlands. Some emphasis on identification of common aquatic plants and animals. Prerequisites: BIO 118 and CHEM 002.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 118 and CHEM 002)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 169. ECOSYSTEMS OF NORTH AMERICA. (4 Credits)**
An extended field trip to observe and conduct ecological studies of 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 departure there is an orientation period and upon returning from the field trip a review and synthesis period. A field trip fee is assessed to cover travel expenses. Prerequisite: BIO 118 and permission of the instructor.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 118)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 170. INTRO INSECT ECOLOGY. (4 Credits)**
Field and laboratory study of insects, their diversity, life history, ecology, and behavior. Introduction to the basic principles of insect interaction with the biotic and abiotic components of their environments. Examination of insect taxonomy and biology through field investigations and collection of insects in prairies, wetlands, and forests in northwest Iowa. Field activities and group projects will stress hypothesis development and experimental design. Prerequisite: BIO 1 or BIO 11.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 001 or BIO 011 or AP 007)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 171. PLANT ECOLOGY. (4 Credits)**
Principles of plant population, community, and ecosystem ecology investigated through studies of native vegetation in local prairies, wetlands, and forests. Major topics include energy allocation, reproduction and pollination, resource partitioning and niches, life-history characteristics, age and size structured demography, clonal growth, intra- and inter-specific interactions, seed ecology and seed banks, succession and the environmental variables affecting the composition, and structure and productivity of native plant communities. Participation in field trips to the Loess Hills in western Iowa and to northeast Iowa's Paleozoic Plateau is required. Prerequisites: BIO 118, BIO 008 recommended.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** BIO 118
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 172. WETLAND ECOLOGY. (4 Credits)**
Examination of the ecology, classification, creation, function, restoration, and management of wetlands. Discussion of the legal and regulatory processes for protection of wetlands and restored prairie pothole wetlands. Participation in a field trip to the Platte River in central Nebraska is required. Prerequisite: BIO 118.
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** (BIO 118)
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 174. BEHAVIORAL ECOLOGY. (4 Credits)**
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 196. INTERNSHIP. (1-5 Credits)**
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Credit/No Credit with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 197. UNDERGRADUATE RESEARCH. (1-4 Credits)**
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 198. INDEPENDENT STUDY. (1-4 Credits)**
**Level:** Non Degree Coursework, Professional Health Care, Undergraduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 296. GRADUATE INTERNSHIP. (1-5 Credits)**
**Level:** Graduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Credit/No Credit with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 297. GRADUATE RESEARCH. (1-4 Credits)**
**Level:** Graduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Credit/No Credit with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None

**LLAB 298. GRADUATE INDEPENDENT STUDY. (1-4 Credits)**
**Level:** Graduate
**Prerequisite(s):** None
**Corequisite(s):** None
**Restrictions:** None
**Primary grade mode:** Standard Letter with IP
**Schedule type(s):** Independent Study, Off-campus catalog credit, Web Instructed
**Area(s) of Inquiry:** None