

**Course Outline for:** BIOL 1104 Minnesota Natural History and Field Biology

**A. Course Description:**

1. Number of credits: 4
2. Lecture hours per week: 3  
Lab hours per week: 3
3. Prerequisites: ENGC 0960 (C- or better) OR READ 0960 (C- or better) OR High School GPA of 2.60+ OR ACT Sub-Score of 21+ OR ACT Sub-Score of 19+ and High School GPA of 2.50+ OR SAT Read/Write score of 480+ OR SAT Read/Write score of 440+ and High School GPA of 2.50+ OR Accuplacer Reading score of 250+ OR Accuplacer Reading score of 236+ and High School GPA of 2.50+ OR MCA Reading score of 1047+ OR MCA Reading score of 1042-1046 and High School GPA of 2.50+
4. Corequisites: None
5. MnTC Goals: #3 Natural Sciences and #10 People and the Environment

A non-majors general education lab course that emphasizes the diversity of life in Minnesota from a natural history perspective. Topics include the scientific method, adaptation and evolution of plants and animals, ecology of terrestrial and aquatic biomes, endangered species, and the decline of biodiversity. Lab requires field trips on- and off-campus, which might include required field trips on prescribed dates. Lecture 3 credits, 3-hour lab 1 credit, including field trips on specific dates and times listed in eServices.

**B. Date last reviewed/updated:** January 2023

**C. Outline of Major Content Areas:**

**Lecture:** Subtopics listed under each main topic may vary due to recent developments in the field and current events.

1. Natural History as a Science
  - a. Experimental design and the scientific method
  - b. Field biology techniques
2. History of Natural History in Minnesota
  - a. Minnesota glacial history
  - b. Rivers, lakes, soil and climate
  - c. Natural history, art and literature
  - d. State of conservation of natural areas in Minnesota
    - i. Human impact on aquatic communities
    - ii. Human impact on terrestrial communities
3. Evolution and Adaptation
  - a. Forces of evolution
  - b. Phylogeny and classification

- c. Animal and plant biology
- d. Plant and animal identification
- 4. Minnesota Biotic Communities
  - a. Factors determining original vegetation: geology, climate
  - b. Deciduous forest
  - c. Northern coniferous forest
  - d. Tall grass prairie
  - e. Wetlands
  - f. Lakes
  - g. Streams and rivers
  - h. Habitat restoration
- 5. Selected Ecological Concepts
  - a. Populations
  - b. Community structure and dynamics
  - c. Ecosystem ecology
  - d. Ecological succession
  - e. Phenology
  - f. Biogeochemical cycling
- 6. Biodiversity and its Future in Minnesota
  - a. Climate change and other threats to Minnesota communities
  - b. Conservation of biotic communities

**Laboratory:** Laboratory and field biology experiences may vary, depending on the weather and resources available for field work. This will also apply to the amount of emphasis given to the different biotic communities. Students will actively participate in lab by engaging in studies related to:

- 1. Light microscopy
- 2. Community ecology: Species interactions
- 3. Ecosystem ecology: Food web and trophic level energy
- 4. Aquatic habitats and water quality testing
- 5. Prairies
- 6. Deciduous forests
- 7. Northern coniferous forests
- 8. Plant and animal biology
- 9. Animal behavior
- 10. Changes in the Minnesota landscape: past and future

**D. Course Learning Outcomes:**

Upon successful completion of the course, the student will be able to:

- 1. Describe the scientific method and explain the scientific meaning of the words fact, hypothesis, and theory. (Goal 3a)
- 2. Formulate, test, and logically evaluate hypotheses using appropriate data collection methods and statistical analyses. (Goal 2a, 2b, 2c, 2d, 3a, 3b)
- 3. Make appropriate scientific measurements, interpret biological data, and communicate findings both orally and in writing. (Goal 2a, 2b, 2c, 3b, 3c)

4. Recognize major ecosystems and common organisms found in Minnesota. (Goal 3a, 10a, 10c)
5. Explain and critique biological concepts relating to evolution, taxonomy, and ecology. (Goal 2a, 3a, 10a, 10c)
6. Describe the importance of biodiversity, identify activities threatening Minnesota's biodiversity, relate biological impoverishment to broader environmental problems, and evaluate some potential solutions. (Goal 2b, 2c, 2d, 3a, 3d, 10c, 10d, 10e)

**E. Methods for Assessing Student Learning:**

A variety of evaluation and assessment methods may be used:

1. Written examinations (multiple choice, true-false, fill-in-the-blank, matching, short answer and essay questions) over reading assignments, class discussions, lecture, lab and field work
2. Quizzes
3. Laboratory practical examinations
4. Lab and field reports
5. Poster and/or oral presentations
6. A final comprehensive exam

**F. Special Information"**

Instructors will include the most recent version of the Departmental Expectations document in their course syllabus.

When offered on-campus, the laboratory portion of the course is delivered in the Biology Learning Center (BLC). Instructors will include the most recent version of the Biology Learning Center (BLC) Expectations document in their course syllabus.

Lab requires field trips on- and off-campus which might include required field trips on specific dates and times listed in eServices.