

# North Hennepin Community College

## BIOL 2610: General Ecology

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 3

OJT Hours/Week: \*.\*

Prerequisites:

This course requires both of these prerequisite categories

1. BIOL 1102 - Principles of Biology II (Minimum grade: 1.67 GPA Equivalent)

And

2. One of these two

Placement into MATH 1170 or MATH 1200

MATH 1150 - College Algebra (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

We will examine the interrelationships of organisms and their environments, emphasizing the historic development of fundamental principles at the levels of individuals, population, community, and ecosystem through examination of theoretical and empirical findings. Skills of professional biologists will be practiced, such as reading primary literature, designing/carrying out experiments, and evaluating qualitative and quantitative data. Prerequisite: Prerequisite: BIOL 1102, and placement above MATH 1150 or successful completion of MATH 1150 or higher, with a C or better.

**B. COURSE EFFECTIVE DATES:** 05/16/2016 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Subdisciplines of ecology, evolution and tradeoffs.  
Biomes and global climate patterns. Ecosystem ecology, and primary production in aquatic and terrestrial environments.  
Trophic levels, nutrient cycling, and trophic cascades in aquatic and terrestrial environments.  
Population ecology: growth, regulation, fluctuations and stability, and extinctions.  
Species and resource interactions and life history tradeoffs.  
Species diversity, biodiversity, island biogeography, and extinction.  
Succession and community development, primary and secondary succession, and concepts of stability and instability.

## **D. LEARNING OUTCOMES (General)**

1. Explain ecological concepts at the organismal, population, community, and ecosystem levels. (Goal 3a, ELO 1)
2. Recognize unifying principles of ecology, including: tradeoffs, evolution and adaptation, feedback and stability, and scale. (Goal 3bd, ELO 1, 2, 4)
3. Be able to carry out fundamental ecological calculations, including: population growth, diversity indices, and ecological efficiencies. Students will also learn the use of mathematical and graphical models. (Goal 3bcd, ELO 1, 2, 4)
4. Demonstrate knowledge of fundamental ecological patterns, such as: global distribution of biomes, population dynamics, the relation of trophic levels to productivity, and ecological succession. (Goal abc, ELO 1, 2, 4)
5. Apply and demonstrate an understanding of typical forms of ecological data, and how these data illustrate basic ecological concepts including impact of humans on the natural and built world. (Goal 3acd, ELO 1, 2, 3)
6. Evaluate data to understand ecological processes and apply concepts in novel situations. (Goal 3bd, ELO 1, 2, 4)
7. Apply relevant statistical tests to ecological data analysis. (Goal 3bcd, ELO 1, 2, 4)
8. Design and carry out experiments using traditional and molecular approaches to ecological questions. (Goal abc, ELO 1, 2, 4)
9. Communicate in standard scientific formats, such as lab notebooks, formal lab reports, journal clubs, research posters and/or presentations, and reading primary literature. (Goal 3c, ELO 1, 2, 4)

## **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

1. Knowledge of Human Cultures and the Physical and Natural World - Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills - including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.
3. Personal and Social Responsibility and Engagement - Including: Civic knowledge and involvement - campus, local and global; Intercultural knowledge and competence; Ethical reasoning and action; Foundations and skills for lifelong learning.
4. Integrative and Applied Learning - Including: Synthesis and advanced accomplishment across general education, liberal studies, specialized studies and activities in the broader campus community.