

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: GENERAL ECOLOGY **Course #:** BIO* 178

Course Description:

4 semester hours (3 class hours/3 laboratory hours).

Lecture: An introduction to the basic principles of ecology and application of these principles to conservation and environmental problems. Use of computers is an integral part of this course. Field trips required.

Lab: Lab section to accompany BIO* 178 lecture. To introduce students to a field and laboratory study of ecology, Ecology is the study of interactions among organisms, and between organisms and their physical environment. We will investigate basic ecological theories through laboratory exercises conducted both in class and in the field. Topics that may be covered could include: population growth, competition, species interaction, habitat description, animal behavior and community analysis. Part of the laboratory exercises will focus on environmental issues and the measurement of environmental data.

Pre-requisite/Co-requisite:

SCI* 099 or equivalent and ENG* 063 and ENG* 073 or satisfactory scores on placement exams.

Goals (Lecture): To provide the student with a basic understanding of ecological principles including: the constant change of the Earth over geologic time, concepts of adaptation, natural selection, and evolution, definitions of species and speciation, interactions of living organisms and the physical environment, inter- and intraspecific relationships, changes in ecological communities over time. In addition, students will be exposed to concepts of ecology as they relate to current major environmental problems.

Goals (Lab): To provide students with projects and activities to reinforce basic ecological principles including: population and community dynamics, abiotic and biotic interactions, and nutrient cycling; to develop proficiency with modern sampling tools and techniques; to identify the major biomes, as well as the micro- and macroecosystems of Connecticut. The general objectives of Bio 171L are to: (1) Utilize basic ecological sampling techniques via hands-on examples and field projects and (2) Apply the principles and concepts of ecology to data collected from the field.

Outcomes (Lecture):

At the end of the course, students should be able to:

1. Define and discuss the scientific method
2. Define ecology, ecosystem, community, and population
3. Relate ecology to the other biological, chemical, and physical sciences

4. Explain the relationships among adaptation, natural selection, and evolution
5. Discuss the sources of genetic variation within a population
6. Analyze how abiotic components of an ecosystem affect the biotic components
7. Compare and contrast plant adaptations to the environment
8. Define decomposition and discuss the variety of processes involved
9. Compare and contrast animal adaptations to the environment
10. Summarize the types of population distribution
11. Explain the factors of population growth and discuss why populations go extinct
12. Compare and contrast various forces of intraspecific population regulation
13. Discuss the payouts, tradeoffs, and consequences of both sexual and asexual reproduction
14. Identify the various types of species interactions that occur within communities
15. Define succession
16. Compare and contrast various forces of interspecific competition
17. Define predation and distinguish among its forms
18. Describe the various types of parasitism
19. Explain the various processes that shape communities
20. Discuss the concept and application of sustainable yield to the exploitation of natural populations
21. Describe the concept of the ecosystem including thermodynamics and productivity
22. Identify the major biogeochemical cycles and describe sources and sinks of each
23. Compare and contrast the major biomes of Connecticut and the Earth as a whole
24. Identify, analyze, and discuss the major causes of global environmental change and their impacts on life

Outcomes (Lab):

At the end of this laboratory course component, the student will be able to:

- Use modern techniques of Geographic Information Systems (GIS) and Global Positioning Systems (GPS) to assist in data collection and analysis.
- Properly carry out soil sampling and analysis
- Properly carry out air sampling and analysis.
- Properly carry out weather sampling and analysis
- Properly carry out water quality sampling and analysis
- Properly carry out dissolved gas and nutrients sampling and analysis
- Properly carry out population and community structure sampling and analysis
- Compute simple statistical analyses of data sets from the field
- Interpret the analysis of data sets from the field

College Policies:

Plagiarism: Plagiarism and Academic Dishonesty are not tolerated at Northwestern Connecticut Community College. Violators of this policy will be subject to sanction. Please refer to your “Student Handbook” under “Policy on Student Rights,” the Section entitled “Student Discipline,” or the College catalog for additional information.

Americans with Disabilities Act (ADA): The College will make reasonable accommodations for persons with documented learning, physical, or psychiatric disabilities. Students should notify Roseann Dennerlein, the Counselor for Students with Disabilities. She is located at Green Woods Hall, in the Center for Student

Development. Her phone number is 860-738-6307 (V/TTY) and her email is rdennerlein@nwcc.commnet.edu.

School Cancellations: If snowy or icy driving conditions cause the postponement or cancellation of classes, announcements will be made on local radio stations. Students may also call the College directly at (860) 738-6464 to hear a recorded message concerning any inclement weather closings. Students are urged to exercise their own judgment if road conditions in their localities are hazardous.