JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Ecology

Course Abbreviation and Number: BIO 2650 **Credit Hours:** 4 **Course Type:** Lecture/Lab

Course Description: Students will be introduced to the interactions between living organisms and their physical, chemical and biological environment. Several levels of ecological organization will be examined, including the study of different types of populations, communities and ecosystems. Topics include population structure and growth, species interaction, energy flow, nutrient cycling, succession, and applications to current environmental management issues. Students will perform ecological experiments in the field as well as in the laboratory.

Prerequisite: ENG 1510 and BIO 1551+BIO1552 or BIO 1570 or BIO 1580; Prerequisite/Corequisite: MAT 1590 or higher.

General Education Requirements Met

SUNY	JCC
Natural Sciences	Scientific Reasoning

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Describe major habitats found on land in in water and explain adaptations of organisms to the variation in abiotic factors found in major habitat types.
2. Evaluate the use of distribution patters, life tables, age structures, survivorship curves and population growth curves in analyzing the structure of populations.
3. Analyze factors that affect the outcome of competitive interactions between individuals within a population and those of different species in a community.
4. Explain the relationships between predator and prey populations and how they apply to the structure of food webs and trophic interactions in a community.
5. Analyze the flow of energy through an ecosystem and apply it to major biogeochemical cycles associated with ecosystem function.
6. Discuss current applied ecological issues including the effects of habitat fragmentation and loss, invasive species, global climate change, and pollution.
7. Demonstrate an understanding of the methods scientists use to explore natural phenomena, including observation, hypotheses development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling. [SUNY Gen Ed – Natural Sciences]
8. Application of scientific data, concepts, and models in one of the natural sciences. [SUNY Gen Ed – Natural Sciences]

Topics Covered:

- The physical environment
  - Climate
  - The aquatic environment
  - The terrestrial environment
- The organism and its environment
  - Adaptation and natural selection
  - Plant adaptations to the environment
  - Animal adaptations to the environment
- Populations
  - Properties of populations
  - Population growth
  - Life history
  - Intraspecific population regulation
- Species interactions
  - Species interactions, population dynamics, and natural slection
  - Interspecific competition

    - Predation
    - Parasitism and mutualism
- Community ecology
    - Community structure
    - Factors influencing the structures of communities
    - Community dynamics
    - Landscape dynamics
- Ecosystem ecology
    - Ecosystem energetics
    - Decomposition and nutrient cycling
    - Biogeochemical cycles
- Ecological biogeography
    - Terrestrial ecosystems
    - Aquatic ecosystems
    - Coastal and wetland ecosystems
    - Large-scale patters of biological diversity
    - The ecology of climate change

Laboratory topics/activities

- Field ecology and lab/field journal guidelines
- BioBlitz! Plant and tree identification
- Botanical scavenger hunt; herbarium project
- Population ecology: quadrat analysis
- Population ecology: mark and recapture
- Lake ecology and literature search
- Natural selection: predator/prey
- Allelopathy and invasives (2 weeks)
- Dispersal
- Population genetics
- Scientific research paper presentations
- Winter Ecology: adaptations for survival

Information for Students

- Expectations of Students
    - Civility Statement
    - Student Responsibility Statement
    - Academic Integrity Statement
- Accessibility Services
  Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- Get Help: JCC & Community Resources
- Emergency Closing Procedures
- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0

- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

Effective Date: Fall 2023