BI 223Z : PRINCIPLES OF BIOLOGY: ECOLOGY AND EVOLUTION

Transcript title

Principles of Bio: Eco Evol

Credits

5

Grading mode

Standard letter grades

Total contact hours

70

Lecture hours

40

Lab hours

30

Prerequisites

MTH 095 (or higher, or minimum placement Math Level 16); and (choose one of WR 065, WR 121Z, or minimum placement Wr/Comm Level 7).

Course Description

Explores the unity and diversity of life through evolutionary mechanisms and relationships, and adaptation to the environment. Examines population, community, and ecosystem ecology. Intended for science majors.

Course learning outcomes

1. Apply the iterative process of science to generate and answer biological questions by analyzing data and drawing conclusions that are based on empirical evidence and current scientific understanding.
2. Use evidence to develop informed opinions on contemporary biological issues and explain the implications of those issues on society.
3. Provide evidence for phylogenetic relationships which illustrate the unity and diversity of life.
4. Describe how adaptation, development, mutation, and the environment affect organismal evolution.
5. Apply mathematical models to describe how populations change through time in relation to biotic and abiotic factors.
6. Explain how organisms and their environments affect each other across different temporal and spatial scales.
7. Interpret models explaining the flow of energy and cycling of matter in ecosystems.
8. Sustainability Outcome: Explain the interconnectedness of environmental, social, and economic systems in the context of resource management (food, freshwater, wildlife), waste management, and wildlife conservation.

Content outline

1. Fossil evidence for evolution
2. Using of morphology and embryonic developmental evidence to construct phylogenetic hypotheses
3. Using molecular evidence to construct phylogentic hypotheses
4. Population genetics and Hardy-Weinberg equilibrium model
5. Allele frequency changes and mechanisms of evolution
6. Natural selection
7. Sexual selection
8. Mechanisms of speciation
9. Biodiversity and extinction through time
10. Population growth models
11. Species interactions
12. Concepts of biologic community organization in space and time
13. Biogeography of terrestrial and aquatic communities at global, regional, and local scale
14. Trophic pyramids and energy flow through ecosystem
15. Recycling of matter and nutrients including decomposition
16. Bacterial metabolism and nitrogen cycling
17. Carbon cycle at annual, decadal, and geologic time scales
18. Climate change evidence, models, and predictions

Required materials

Required textbook (same for all three Principles of Biology courses), access to a computer with internet.

General education/Related instruction lists

- Science Lab