

Common Course Outline
BIOL 111
Biology II: Evolution and Ecology
4 credits

The Community College of Baltimore County

Description

BIOL 111- 4 credits- Biology II: Evolution and Ecology focuses on the evolution of organisms and the ways in which they interact to create the dynamics of communities and ecosystems. The course emphasizes fundamentals of evolution including the roles of molecular and developmental biology, and ecology; how organisms interact and influence their environment at the level of communities and ecosystems.

4 credits: 3 lecture hours, 3 laboratory hours per week

Prerequisites: BIOL 110

Overall Course Objectives

Upon completion of this course the student will be able to:

1. apply scientific methodology individually and in small groups in the laboratory by using controls, metric system measuring, and scientifically acceptable data recording with tables and graphs where appropriate;
2. explain the evidence for evolution by natural selection including Charles Darwin's contribution to the theory of evolution and Modern Synthesis;
3. summarize the interactions that control genetic variation at the population level;
4. determine if a species is evolving or is in genetic equilibrium using the Hardy-Weinberg equation;
5. explain and predict how isolating mechanisms can give rise to new species;
6. relate the developmental stages and structures of an embryo to the organism's evolutionary history;
7. identify the genetic component in evolutionary patterns of development and the ethics of how current biotechnology is helping to redefine this area;
8. describe the energy flow through an ecosystem and how the major biochemical cycles in the ecosystems can be impacted when humans disturb the equilibrium of these cycles;
9. explain the interactions of abiotic and biotic factors that control populations;
10. describe the relationship between disturbance and succession;
11. explain the biome as an extension of an ecosystem;
12. compare and contrast several major aquatic and terrestrial biomes;
13. find, evaluate, use and cite appropriate scientific literature and present credible information in an organized manner; and
14. discuss the modern interpretation of the diversity of life, how it evolves and its interdependence with the environment.

Major Topics

- I. Darwinian Evolution and the Modern Synthesis
- II. Microevolution: the genetics of populations
- III. Macroevolution: the evolution of species
- IV. Developmental Biology: the development of organisms at the cellular level
- V. Evolutionary Developmental Biology: the role of molecular and developmental biology to evolutionary theory
- VI. Community Ecology: intraspecific and interspecific relationships
- VII. Ecosystems: productivity and biogeochemical cycling in ecosystems and the interactions between biotic and abiotic components

Course Requirements

Students must use appropriate academic resources.

- 1) Students must pass lecture and lab with a 60% to pass the course. Failure in either the lecture or the lab is an automatic F for the course.
- 2) Grades earned in lecture will count 70-80% of the total course grade with the rest of the grade coming from lab.
- 3) Lecture Assessment tools:
 - a) At least three unit lecture exams.
 - b) A combination of at least three article summaries, problem sets, or oral presentations.
- 4) Lab Assessment Tools:

A formal lab report and at least two of the following are to be used and will be determined by the campus course coordinator. For the formal lab report, students must use appropriate academic resources. Each assessment tool is to be worth at least 15% of the total lab grade.

 - a) Weekly lab reports
 - b) Pre-lab assignments
 - c) Lab notebook
 - d) At least two lab practicals
 - e) At least four quizzes
 - f) Field trips or field assignments

Other Course Information

This course is a sequential course with BIOL 110 and they can be transferred as a full year of biology. This course is an approved 4-credit General Education course in the Biological and Physical Sciences category that fulfills the laboratory requirement. Please refer to the current CCBC Catalog for General Education course criteria and outcomes.