Miami Dade College

Course Description

BSC2011L | Principles of Biology Lab 2 | 2.00 credits

This course is intended for students pursuing a major and complements the lecture course BSC2011. As such, it functions to provide them with hands-on experience with laboratory exercises designed to complement the presentation of the principles of biology as they relate to evolution, biological diversity, form and function in plants and animals, ethnology, ecology and conservation biology. Prerequisite: BSC2010L; corequisite: BSC2011

Course Competencies

Competency 1: The student will learn, upon successful completion of this course, the nature of evolution by:

1. Defining the concept of evolution according to natural selection
2. Analyzing the role of natural selection in the shaping of organismal populations
3. Analyzing the effects of the directional, stabilizing, and disruptive modes of selection
4. Manipulating various biological and environmental parameters on populations
5. Describing the conditions in organismic populations that lead to extinction

Competency 2: The student will learn, upon successful completion of this course, the concepts of population genetics and the Hardy-Weinberg theorem by:

1. Defining the biological concept of a population
2. Explaining the Hardy-Weinberg theorem
3. Describing the relationship between allelic and genotypic frequencies
4. Demonstrating the conditions necessary to maintain Hardy-Weinberg equilibrium
5. Testing hypotheses illustrating the effects of microevolutionary agents that cause populations to depart from Hardy-Weinberg equilibrium

Competency 3: The student will learn, upon successful completion of this course, prokaryotic characteristics and variation diversity by:

1. Describing the variety and ubiquity of prokaryotes
2. Explaining the structure of prokaryotes, including colony morphology and cell morphology
3. Performing aseptic techniques in the handling of bacterial cultures
4. Identifying various different types of bacteria in microscopic sections
5. Describing the ecological and economic importance of bacteria

Competency 4: The student will learn, upon successful completion of this course, protistan characteristics and variation by:

1. Describing the variety of protists
2. Identifying representative specimens and describing characteristics of major protistan taxonomic groups using microscopy
3. Describing the ecological and economic importance of protists

Competency 5: The student will learn, upon successful completion of this course, the characteristics and variety of bryophytes and seedless vascular plants by:

1. Differentiating bryophytes from seedless vascular plants
2. Describing the adaptations bryophytes and seedless vascular plants show to life on land by using specimens
3. Identifying representatives of the phyla of bryophytes and seedless vascular plants
4. Describing alternation of generations life cycle as seen in plants
5. Comparing the types of life cycles of bryophytes and seedless vascular plants
6. Describing the ecological and economic importance of bryophytes and seedless vascular plants

Competency 6: The student will learn, upon successful completion of this course, the characteristics and variety of gymnosperm and angiosperm plants by:

1. Identifying representatives of the phyla of gymnosperms and angiosperms
2. Comparing life cycles observed in gymnosperms and angiosperms
3. Describing the features of the flower, ensuring pollination by various agents
4. Identifying types of fruits through representative specimens
5. Comparing the adaptations of gymnosperms and angiosperms for life on land
6. Describing the ecological and economic importance of gymnosperms and angiosperms

Competency 7: The student will learn, upon successful completion of this course, the characteristics and variety of fungi by:

1. Describing the variety of fungi
2. Identifying and describing representative phyla of fungi
3. Comparing the types of life cycles observed in fungi
4. Describing the ecological and economic importance of fungi

Competency 8: The student will learn, upon successful completion of this course, the variety and characteristics of sponges, cnidarians, and the lophotrochozoan phyla of the flatworms, annelids, and mollusks by:

1. Comparing the body plans of representative members of the phyla porifera, cnidaria, Platyhelminthes, Annelida, and Mollusca through specimens
2. Describing the relationship and characteristics of the behavioral and physical adaptations to the environments of these various phyla
3. Explaining how similarities and differences among these various phyla relate to their phylogenetic relationships

Competency 9: The student will learn, upon successful completion of this course, the variety and characteristics of the ecdysozoan phyla of the nematodes and arthropods, and the deuterostome phyla of the echinoderms and chordates by:

1. Comparing the body plans of representative members of the phyla Nematoda, Arthropoda, Echinodermata, and chordate through specimens
2. Describing the relationship and characteristics of the behavioral and physical adaptations to the environments of these various phyla
3. Explaining how similarities and differences among these various phyla relate to their phylogenetic relationships

Competency 10: The student will, upon successful completion of this course, learn the anatomy of vertebrates by:

1. Describing the four principal types of animal tissue and identifying examples of each by microscopy
2. Identifying specialized cell groups comprising the principal tissues of vertebrates
3. Analyzing the structure and function of vertebrate organs, organ systems, and the interactions among them

Competency 11: The student will, upon successful completion of this course, learn the basic principles of ecology by:

1. Describing the biotic and abiotic components of a representative ecosystem, including trophic levels and biogeochemical cycles
2. Designing an ecology-based investigation, which includes hypothesis, predictions, data collection techniques and analyses, and discussion of results
3. Illustrating the results of the scientific investigation

General Education Learning Outcomes:

- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information
- Describe how natural systems function and recognize the impact of humans on the environment