Miami Dade College

BSC 2011L **Principals of Biology II Laboratory**

Course Description: This course complements BSC 2011 - Principles of Biology 2. The student will use hands-on experiential learning with laboratory exercises designed to illustrate evolution, biological diversity, form and function in plants and animals, ecology, and conservation biology.

Course Competency	Learning Outcomes
Competency 1: The student will learn, upon successful completion of this course, the nature of evolution by:	• Communication • Numbers / Data • Critical thinking • Environmental Responsibility
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:	• Communication • Numbers / Data • Critical thinking
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 diversity by:	• Numbers / Data • Critical thinking

	• Environmental Responsibility
1. Describing the diversity 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 diversity by:	• Critical thinking • Environmental Responsibility
1. Describing the diversity 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 diversity of bryophytes and seedless vascular plants by:	• Critical thinking
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 diversity of gymnosperm and angiosperm plants by:	• Critical thinking
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.	
Course Competency 7: The student will learn, upon successful completion of this course, the characteristics and diversity of fungi by:	• Critical thinking • Environmental Responsibility
1. Describing the diversity 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.	
Course Competency 8: The student will learn, upon successful completion of this course, the diversity and characteristics of sponges, cnidarians, and the Lophotrocozoan phyla of the flatworms, annelids, and mollusks by:	• Critical thinking
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.	

Course Competency 9: The student will learn, upon successful completion of this course, the diversity and characteristics of the Ecdysozoan phyla of the nematodes and arthropods, and the Deuterostome phyla of the echinoderms and chordates by:	• Critical thinking
1. Comparing the body plans of representative members of the phyla Nematoda, Arthropoda, Echinodermata, and Chordata 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.	
Course Competency 10: The student will, upon successful completion of this course, learn the anatomy of vertebrates by:	• Critical thinking
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.	
Course Competency 11: The student will, upon successful completion of this course, learn the basic principles of ecology by:	• Communication • Numbers / Data • Critical thinking • Environmental Responsibility
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.	