Common Course Outline for: BIOL 2203 Botany

A. Course Description

1. Number of credits: 4
2. Lecture hours per week: 3
   Lab hours per week: Minimum of 3 hours of self-directed lab work
3. Prerequisites: BIOL 1105 (C or higher)
4. Co-requisites: None
5. MnTC Goal: 3

A majors lab course that introduces the biology of plants and plant-like organisms. Course takes an evolutionary perspective emphasizing morphology, anatomy, adaptations, physiology, reproduction, ecology and economic importance of plants. Lecture 3 hours. Lab requires a minimum of 3 hours per week of self-directed laboratory work.

B. Date last revised: August 2019

C. Outline of Major Content Areas

Lecture: Subtopics listed under each main topic may vary due to recent developments in the field and current events.

1. Early History and Development of Plant Study
2. Survey of Plant Diversity
3. Eukaryotic vs. Prokaryotic Cells
4. Meristematic Tissues
5. Root Structure
6. Herbaceous and Woody Stems
7. Tissue patterns in Stems
8. Leaf Structure and Function
9. Photosynthesis
10. Transpiration
11. Respiration
12. Economic importance of Plants
13. Ecologic importance of Plants
14. Monocots and Dicots
15. Floral Structure and Function
16. Plant Growth Regulators
17. Plant Genetics and Hybridization
18. Plant Biotechnology and Propagation
19. Evolution of Plant Diversity – a treatment of the major plant phyla
20. Representative life cycles

Laboratory: Students will actively participate in lab by completing studies related to:

1. Survey of representative organisms and their characteristic macroscopic and microscopic features
    a. Cyanobacteria
    b. Algae
    c. Slime molds
    d. True fungi
    e. Mosses
    f. Liverworts
    g. Lower vascular plants
        i. Ferns
        ii. Horsetails
        iii. Club mosses
        iv. Whisk-ferns
    h. Gymnosperms
    i. Angiosperms
2. Long-term experiments that may include
    a. Tissue culture
    b. Plant hormone interactions
    c. Plant genetics
    d. Angiosperm germination
    e. Plant propagation
    f. Fern life cycle and development
    g. Isolation of plant cell DNA
    h. Electron microscopy of plant structures

D. Course Learning Outcomes

Upon successful completion of the course, the student will be able to:

1. Assemble major plant groups in a reasonable evolutionary sequence and explain the rationale of relationships by describing each group's evolutionary contributions. (2a, 2b, 2c, 3a, 3c)
2. Explain how the mode of life of major representative taxonomic groups, both present and past, are related to the plant's environment. (2a, 2c, 3a, 3b, 3c)
3. Explain how the anatomy and morphology of representative taxonomic groups are related to function. (3a, 3b, 3c)
4. Describe how plant life cycles are related to outcomes 1, 2, and 3. (2a, 2c, 3a, 3b, 3c)
5. Describe the role that plants play in such areas as agriculture, ecology, industry and medicine. (2a, 2c, 3a, 3c, 3d)

E. Methods for Assessing Student Learning

A variety of evaluation and assessments methods will be used including, but not limited to, the following:

1. Written examinations (multiple choice, true-false, fill-in-the-blank, matching, and short answer questions)
2. Quizzes
3. Lab practical exams and/or field tests

4. Lab reports
5. A final comprehensive exam

F. Special Information

The laboratory portion of the course is delivered in the Biology Learning Center (BLC). The BLC is an open lab and has its own set of operating policies and procedures. An instructor will include the most recent version of the Departmental and Biology Learning Center Policies in the course syllabus.