

Alexandria Technical and Community College

BIOL 1413: Plant Biology

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: Goal 03 - Natural Science, Goal 10 - People/Environment

This course meets Minnesota Transfer Curriculum (MnTC) goal area 3 and 10. This course is designed for both non-science and science majors. The course covers the structure and physiology of plants, their diversity, adaptations to the environment, and their evolutionary and ecological relationships. Also included is the human influence affecting the plant aspect of the environment and solutions to environmental challenges. Laboratory work is included.

B. COURSE EFFECTIVE DATES: 05/18/2009 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Analyze plant adaptations and discuss the evolutionary changes from algae, to bryophytes, to nonvascular plants, and to the seeded vascular plants, including gymnosperms and angiosperms.
2. Compare and contrast the diversity of plant cells and the plant organ modifications of stems, leaves, and roots.
3. Discuss the influence of various environmental factors and nutrients on the germination of seeds and plant growth.
4. Analyze factors that have caused human influence to natural ecosystems, the adaptation of plants to the environmental influence, and propose solutions to the environmental problems. Include social, legal, political, economic, and religious issues that may affect the solutions to environmental problems.
5. Perform exercises to diagram the process of photosynthesis, carbon fixation, transpiration, and the pathway of water from the soil through the various root tissues.
6. Perform laboratory experiments to demonstrate the scientific process, the properties of osmosis and diffusion, to demonstrate the nutritional aspect of seeds, plant reproduction, plant tropisms, the predominance of the pigment chlorophyll in plants, and the environmental influence of wave length to plant germination.

D. LEARNING OUTCOMES (General)

1. The learner will demonstrate knowledge of plant structures, functions, and adaptations.
2. The learner will demonstrate knowledge of plant cell structure, photosynthesis, and cellular respiration. demonstrate knowledge of plant cell structure, photosynthesis, and cellular respiration.
3. The learner will demonstrate knowledge of plant evolution and diversity.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 10 - People/Environment

1. Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
2. Discern patterns and interrelationships of bio-physical and socio-cultural systems.
3. Describe the basic institutional arrangements (social, legal, political, economic, religious) that are evolving to deal with environmental and natural resource challenges.
4. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
5. Propose and assess alternative solutions to environmental problems.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted