



## MASTER COURSE OUTLINE

Prepared By: Kathleen Duvall, Christy Welch

Date: May 2020

## COURSE TITLE

Botany

## GENERAL COURSE INFORMATION

Dept.: BOT

Course Num: 130

(Formerly: )

CIP Code: 26.0307

Intent Code: 11

Program Code: N/A

Credits: 5

Total Contact Hrs Per Qtr.: 66

Lecture Hrs: 44

Lab Hrs: 22

Other Hrs: 0

Distribution Designation: Lab Science LS

## COURSE DESCRIPTION (as it will appear in the catalog)

A study of the basic principles of plant life. Topics include: plant cells, tissues, and organs; plant physiology, transport, and reproduction; plant diversity and genetics, as well as a look at how society uses and relies on plants. Related investigations take place during two hours of lab each week. Laboratory topics reinforce classroom learning and include a study of plant structures and plant diversity.

## PREREQUISITES

None

## TEXTBOOK GUIDELINES

A recent edition of an introductory botany text such as *Plants and Society* by Levetin and McMahon, McGraw-Hill Higher Education. The text used must have departmental approval.

## COURSE LEARNING OUTCOMES

*Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills:*

1. Briefly name and describe the major plant groups and plant relatives (algae, and fungi); list and discuss the characteristics that all living organisms share, and describe the chemical nature of living organisms.
2. Discuss plant cell structure, including structure and function of all cellular components; explain the process of diffusion, osmosis, active transport, and plant cell division, applying the processes to living and hypothetical plant cells.
3. Describe and diagram the anatomy and morphology of the flowering plant body including tissues and vegetative organs.
4. Explain the main processes within plant physiology; describe and explain how water and sugars are transported throughout the plant body, how metabolism functions within the plant body, and what specifically happens during photosynthesis.
5. Describe and diagram the structure of flowers and their organs, including inflorescences; describe and diagram what occurs during the flowering plant life cycle, including meiosis and fertilization.

6. Name and describe the different types of fruits, and describe seed structure, germination, and development, as well as the influences of plant hormones; finally discuss the contribution that edible fruits have played in the human diet and society.
7. Explain the laws and terminology included within Mendelian genetics, performing genetic crosses involving one and two gene pairs.
8. Describe the diversity of plant life; list and discuss the characteristics, advantages, and limitations of each major plant group (mosses, ferns, gymnosperms, and angiosperms) and diagram their life cycles.
9. Describe and discuss the components of human nutrition and discuss how plants supply major human nutritional requirements and yield positive health benefits.
10. Describe the origins of agriculture and discuss plant domestication, identifying where many of our domesticated plants originated from; describe the approaches of modern agriculture including the green revolution, plant breeding, and genetic engineering, as well as new alternative crops of interest.
11. List and describe the characteristics of grasses, legumes, and starchy vegetables, discussing the different types of crops within each category and how they are used to feed humans and domesticated animals.
12. Describe and discuss how plants are used within human society historically and in present times, including coffee, tea, and chocolate, herbs and spices, materials such as cloth, paper, and wood, and medicinal plants; if time permits discuss psychoactive, poisonous, and allergy plants.
13. Discuss the role of plants within our environment and the principles of plant ecology, specifically the workings of ecosystems and the distribution of biomes.

### **INSTITUTIONAL OUTCOMES**

IO3 Human Relations/Workplace Skills: Students will be able to demonstrate teamwork, ethics, appropriate safety awareness and/or workplace specific skills.

### **COURSE CONTENT OUTLINE**

1. Plant structure (anatomy and morphology): plant cells, tissues, plant organs – roots, stems, leaves
2. Plant physiology: transport, metabolism, photosynthesis
3. Plant reproduction: flowers, fruits, seeds, Mendelian genetics
4. Plant diversity: characteristics and life cycles of mosses, ferns, gymnosperms, angiosperms
5. Plants as food: human nutrition, agriculture, and food supplies – grains, legumes, starchy vegetables, beverages, herbs and spices
6. Plants in society: materials – wood, paper, cloth, medicinal plants, psychoactive, poisonous, allergy plants
7. Plants in the environment: plant ecology – ecosystems, biogeochemical cycling, ecological succession, biomes and their distribution (as time permits)

### **DEPARTMENTAL GUIDELINES** *(optional)*

- The overall course percentage will be based on the following weighted categories:
  - Lecture exams (including 2-4 tests plus a comprehensive final exam) collectively worth 60-70%,
  - Laboratory work collectively worth 20%, and
  - Class assignments/quizzes collectively worth 10-20% of the overall score.
- A standard grade scale will be used for this course with a 2.0 grade point corresponding to 70-72%.
- All exams are proctored. When possible, exams are held on campus. Online and hybrid courses may have exams online; they may or may not be proctored.
- Lab is an essential part of this class and is required for credit. Students missing more than two labs will not be given credit for this course.
- PO4 should be assessed: Students will be able to recognize or articulate personal/interpersonal aspects of, or connections between, diverse cultural, social, or political contexts.
- PO5 should be assessed: Students will be able to solve problems by gathering, interpreting, combining and/or applying information from multiple sources.

A handwritten signature in black ink, appearing to read "Lindy De" or similar, written above a horizontal line.

**DIVISION CHAIR APPROVAL**

3/22/21

**DATE**