BIOL A183: BOTANY

Item	Value
Curriculum Committee Approval Date	03/20/2024
Top Code	040200 - Botany, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)
Associate Arts Local General Education (GE)	• Area 5 Physical and Biological Sciences, Scientific Inquiry, Life Science (OB)
Associate Science Local General Education (GE)	• Area 5 Physical and Biological Sciences, Scientific Inquiry, Life (OSB)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5B Biological Sciences (5B)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5B Biological Sciences (5B)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B2 Life Science (B2)

Course Description

Includes the dynamics of plants and their processes with particular emphasis on the structure and function of living plants. PREREQUISITE: Successful completion of a course at the level of elementary algebra or Appropriate OCC math placement. Transfer Credit: CSU; UC. C-ID: BIOL 155 when BIOL A183L is also completed.**C-ID:** BIOL 155 when BIOL A183L is also completed.

Course Level Student Learning Outcome(s)

1. Identify the characteristics (form and function) of the major plant groups, including cells, tissues, roots and shoots.
2. Describe plant asexual and sexual reproduction and the general life cycle of all plants, including alternation of generations, male and female structures.
3. Describe the relationship between plants and the environment as it relates to growth and health, including hormones, nutrients, photosynthesis, soil, and circadian rhythms.
4. Discuss the significant contributions of plants to humans through agriculture and horticulture.

Course Objectives

- 1. Demonstrate scientific methods to critically evaluate biological data and concepts presented in lectures and encountered in reading assignments.
- 2. Demonstrate knowledge of the classification of plants and interpret phylogenies.
- 3. Demonstrate knowledge of the plant cell, cell organelles, and plant tissues.
- 4. Demonstrate knowledge of the structure of shoot and root systems of plants and their development.
- 5. Describe and contrast life cycles within and among major plant, fungal, and photosynthetic protist taxa.
- 6. Demonstrate knowledge of the sexual reproduction processes in plants.
- 7. Demonstrate knowledge of the relationship between the plant and the soil environment and nutrient acquisition.
- 8. Demonstrate knowledge of the importance of water and plant function.
- 9. Demonstrate knowledge of the whole concept of light and the plant including the transport of sugar.
- 10. Demonstrate knowledge of the role of plant hormones and plant function.
- 11. Describe the processes that occur within ecosystems including energy flow, and the role of nutrient cycling in maintaining ecosystem integrity.

Lecture Content

Plant Classification: prokaryotic organisms, mycorrhizal fungi, algae, Lichens,Bryophytes, seedless vascular plants, Gymnosperms, and Angiosperms The Plant Cell: Cell structure, cell communication, organelles, molecular processes, cell division, and totipotency. Plant tissues: Simple tissues, complex tissues. The Plant Body: Organization, shoot and root systems, primary and secondary growth, apical and lateral meristems. Shoot system: Stem, organization of primary stem tissues in Dicots and monocots, and stem modifications. Secondarystem: organization of secondary stem tissues in Gymnosperms and Dicot Antiosperms. Lianas, caudiciform plants. Leaves: Morphology, leaf arrangement, anatomy and physiology, and modifications. Root systems: Root morphology, anatomy and physiology, and modifications. Including root, nodules and mycorrhizae. Plant reproduction: asexual and sexual of plants, including the flower structure, development of male and female gametes, pollination, fertilization, seed development, fruits, seed germination. Soils: Water and the soil, soil as a source of nutrients for the plant, cation exchange capacity, pH, and soil profiles. Water and the Plant: water properties, movement of water, diffusion, osmosis, bulk flow, xylem conduction, root pressure, transpiration. Phloem translocation sources and sinks. Tropisms and nastic movements. Light and the Plant: Intensity, quality, duration, C3 and C4 photosynthesis, including CAM, photorespiration, light saturation point, light compensation point, leaf area index, photoperiodism, biological clock, vernalization, chilling requirements. Plant hormones: Auxins, gibberellins, cytokinin, abscisic acid, ethylene, growth retardant. Ecological principles Population Ecology population growth, structure, regulation, and fluctuation Community Ecology interspecific and intraspecific interactions community structure and successional stages Biomes Ecosystem Ecology trophic levels energy flow nutrient cycling Conservation and human impact

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

PowerPoint and slide presentations.

Reading Assignments

Students will be required to read the textbook weekly in preparation for lectures and additional literature that is correlated to assignments and research projects. (3 hours per week)

Writing Assignments

Students will write a paper based on their researched topic.

Out-of-class Assignments

Students will be required to conduct library-based research on an approved topic. (2 hours per week)

Demonstration of Critical Thinking

Exams. Written assignments from either the textbook or other source provided by the instructor. Research term paper.

Required Writing, Problem Solving, Skills Demonstration

Students will individually research a topic related to the lecture material.

Eligible Disciplines

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required. Ornamental horticulture (landscape architecture, floristry, floral design)...: Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Stern, Kingsley R., et al. Introductory Plant Biology, 15th ed. New York: McGraw Hill, 2020 Rationale: - 2. Required Mauseth. An Introduction to Plant Biology, 7th ed. Jones Bartlett Learning, 2019