BIOL G183: BOTANY

Item	Value
Top Code	040200 - Botany, General
Units	4 Total Units
Hours	108 Total Hours (Lecture Hours 54; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• GWC Physical Universe*** (GB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5B Biological Sciences (5B) • Cal-GETC 5C Laboratory Activity (5C)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5B Biological Sciences (5B) • IGETC 5C Laboratory Activity (5C)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B2 Life Science (B2) • CSU B3 Laboratory Activity (B3)

Course Description

Formerly: BIOL G190 – General Botany. This course is intended for biology majors and covers comparative diversity, structure, and function of plant, fungal, and protistan phyla. Topics include: fundamentals of chemistry and biochemistry; cytology, with an emphasis on plant cytology; fundamentals of biological energy: catalysis, cellular respiration and photosynthesis; Mendelian and molecular genetics; ethnobotany; evolution and speciation; plant, population, and community ecology; systematics and taxonomy, with light surveys of (taxonomic) Kingdoms Archaebacteria, Eubacteria, Fungi, and Protista - emphasis is on Kingdom Plantae: plant histology, anatomy, physiology, morphology and diversity; and principles of plant culture (cultivation). PREREQUISITE: Course taught at the level of intermediate algebra or appropriate math placement. ADVISORY: BIOL G180. Transfer Credit: CSU; UC. C-ID: BIOL 155. **C-ID:** BIOL 155.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Identify morphological and physiological characteristics of plants, fungi, and photosynthetic protistans.
3. Describe the life cycles of major plant, fungi, and photosynthetic protistan taxa.
4. Describe the organization and interactions of organisms within selected populations and communities.
5. Describe major metabolic processes of botanical organisms such as cellular transport, photosynthesis, biosynthesis, digestion, cellular respiration, reproduction growth and development.

Course Objectives

- 1. Recognize characteristics of plants, fungi, and photosynthetic protistans and their phylogenic relationship.
- 2. Describe major metabolic processes of botanical organisms such as cellular transport, photosynthesis, biosynthesis, digestion, cellular respiration, reproduction growth and development.
- 3. Construct and interpret phylogenies.
- 4. Describe the structural organization of plants, fungi, and photosynthetic protistans.
- 5. Describe various ecosystem processes such as energy flow and nutrient cycling.
- 6. Describe the organization and interactions of organisms within selected populations and communities.
- 7. Demonstrate a clear understanding of the process of natural selection, genetics and evolution at the molecular, cellular and community interactions level.
- 8. Apply scientific methodology and reasoning regarding experimental design, data collection, interpretation and the application of logic to develop, support, or derive general scientific principles from empirical data.

Lecture Content

1. Origins of life - Evolutionary history, placement, and taxonomic characterization of: 1. Plants 2. Fungi 3. Photosynthetic protists 2. Introduction to botany and the plant body A. Anatomy (structure) 1. Cells 2. Tissues 3. Organs B. Physiology (function) 1. Life cycles 2. C3, C4, and CAM photosynthesis 3. Plant development - Reproduction, hormones, and regulation 3. Introductory Molecular Biology/ Biochemistry A. DNA replication B. Gene expression (transcription) C. Protein synthesis D. Mendelian genetics E. Molecular genetics 4. Microscopy - Cytology 1. Evolutionary theory of molecular dynamics structure 2. Organelle function 3. Cellular energetics - Photosynthesis - Respiration b - Water potential - Catalysis - Thermodynamics 4. Cell cycle - Mitosis - Meiosis 5. Taxonomy and Systematics A. Plant speciation B. Classification schemes 6. Ecology A. Population ecology 1. Population structure, growth, regulation and fluctuation 2. Intraspecific interactions B. Community ecology 1. Community structure and succession 2. Interspecific interactions - Symbiosis - Mutualism - Commensalism - Predation - Competition - Parasitism C. Ecosystem ecology 1. Ecosystem structure - Trophic levels - Energy flow - Nutrient cycling 2. Ecosystem diversity - Biomes 7. Ethnobotany

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Reading Assignments

Textbook

Writing Assignments

1. Weekly or biweekly data collection, analysis, and interpretation.2. Demonstrate proficiency with scientific writing style and format in weekly reports, quizzes, and midterms.3. Show evidence of higher levels of cognizance and problem solving skills in real or hypothetical research scenarios.4. Demonstrate competence with scientific apparati - utility and application.

Out-of-class Assignments

1. Laboratory investigations.2. Field trip(s).3. Literature research/ independent research assignments4. Oral presentation

Demonstration of Critical Thinking

Weekly laboratory exercises include short answer assignments, field and lab research, data collection and analysis. Two local field trips provide opportunities to assess field botany and scientific data collection and writing skills. An independent research project provides an opportunity to assess competence in literature research, presentation media technology, presentation delivery skills and peer review.....

Required Writing, Problem Solving, Skills Demonstration

1. Weekly or biweekly data collection, analysis, and interpretation.2. Demonstrate proficiency with scientific writing style and format in weekly reports, quizzes, and midterms.3. Show evidence of higher levels of cognizance and problem solving skills in real or hypothetical research scenarios.4. Demonstrate competence with scientific apparati - utility and application.

Eligible Disciplines

Biological sciences: Masters degree in any biological science OR bachelors degree in any biological science AND masters degree in biochemistry, biophysics, or marine science OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Raven, Evert, and Eichorn. Biology of Plants, 8th (latest) ed. W. H. Freeman, 2012 Rationale: . 2. Required Rushforth et all. A Photographic Atlas for the Botany Laboratory, 7th (latest) ed. Morton, 2016 Rationale: - 3. Optional Borror. Dictionary of Roots and Combining Forms, 1st (classic) ed. Mayfield Publishers, 1960 Rationale: .