

BOTANY 10 Course Outline as of Fall 2019**CATALOG INFORMATION**

Dept and Nbr: BOTANY 10 Title: PLANT BIOLOGY

Full Title: Plant Biology

Last Reviewed: 1/28/2019

| Units | | Course Hours per Week | | Nbr of Weeks | Course Hours Total | |
|---------|------|-----------------------|------|--------------|--------------------|--------|
| Maximum | 4.00 | Lecture Scheduled | 3.00 | 17.5 | Lecture Scheduled | 52.50 |
| Minimum | 4.00 | Lab Scheduled | 3.00 | 8 | Lab Scheduled | 52.50 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 6.00 | | Contact Total | 105.00 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 105.00

Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

A general education course in plant biology emphasizing the structure and function of plants. Includes genetics, ecology, evolution, reproduction, and diversity of plant life forms.

Prerequisites/Corequisites:**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: A general education course in plant biology emphasizing the structure and function of plants. Includes genetics, ecology, evolution, reproduction, and diversity of plant life forms. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

| | | | | |
|----------------------|----------------------|--------------------------|------------|-----------|
| AS Degree: | Area | | Effective: | Inactive: |
| | C | Natural Sciences | Fall 1981 | |
| CSU GE: | Transfer Area | | Effective: | Inactive: |
| | B2 | Life Science | Fall 1981 | |
| | B3 | Laboratory Activity | | |
| IGETC: | Transfer Area | | Effective: | Inactive: |
| | 5B | Biological Sciences | Fall 1981 | |
| | 5C | Fulfills Lab Requirement | | |
| CSU Transfer: | Transferable | Effective: | Fall 1981 | Inactive: |
| UC Transfer: | Transferable | Effective: | Fall 1981 | Inactive: |

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Apply the scientific method and lab skills to the investigation and evaluation of biological phenomenon.
2. Synthesize knowledge of evolutionary mechanisms, trends, and history with patterns of biodiversity.
3. Integrate basic principles of cellular processes, anatomy, physiology, genetics, ecology, and evolution as they apply to plant systems.
4. Explain connections between humans, plants, and local and global environmental issues.

Objectives:

During this course, students will:

1. Outline the history of plant science.
2. Explain the methods of scientific investigation.
3. Categorize and explain the multiple factors associated with plant ecology, especially human impact on natural landscapes.
4. Examine plant morphology and anatomy, including cell structure and function, vegetative and reproductive morphology, major tissue systems and anatomy of roots, stems, leaves, flowers, fruits and seeds.
5. Describe plant physiological mechanisms, including cellular respiration, water relations, transport, nutrition, photosynthesis, growth and development.
6. Explain the basis of plant inheritance, including Mendelian, chromosomal and molecular genetics.
7. Describe processes of microevolution and macroevolution, including speciation and major trends in plant evolution
8. Compare and contrast the morphology and phylogenetic relationships of algae, bryophytes, seedless vascular plants, and seed plants.

9. Evaluate the relevance and importance of plants to human cultures.
10. Evaluate the importance of biodiversity and conservation efforts.

Topics and Scope:

I. Botany as Science

- A. Course introduction
- B. The methods of natural science
- C. Brief history of plant sciences
- D. The importance of studying Botany

II. Plant Ecology

- A. Environmental constraints to plant distribution
- B. Plant adaptation and evolutionary history
- C. Vegetation types and communities
- D. Ecosystem structure and function
- E. Ecological succession
- F. Ecosystem management

III. Plant Structure

- A. Cell structure and cell division
- B. Major cell and tissue types
- C. Morphology and anatomy of roots, stems, leaves, flowers, fruits and seeds
- D. Functional morphology and adaptation

IV. Plant Physiology

- A. Diffusion, osmosis and passive transport
- B. Plant water relations and xeric adaptations
- C. Soil mineral nutrition
- D. Plant metabolism and energetics
- E. Photosynthesis
- F. Cellular respiration
- G. Internal and external regulation of growth and development.

V. Plant Inheritance and Evolution

- A. Mendelian patterns of inheritance
- B. Chromosomal genetics
- C. Polyploidy in plants
- D. Mechanisms of microevolution and macroevolution
- E. Major phylogenetic patterns

VI. Plant Diversity

- A. Algae
- B. Bryophytes
- C. Seedless vascular plants
- D. Seed plants

VII. Plant Ecology

- A. Economic and ecological relevance of plants to humans
- B. Plant biodiversity and conservation

All topics above will be covered in both lecture and lab.

Assignment:

Lecture-Related Assignments:

1. Assigned readings, approximately 20 - 40 pages weekly
2. Three to six page research paper (0 - 1)

3. Quizzes (2 - 10)

4. Exams (2 - 4)

Lab-Related Assignments:

1. Lab reports (1 - 8)

2. Lab practical exams (1 - 3)

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Research paper

Writing
0 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab report(s) and lab practical(s)

Problem solving
10 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations
0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes and exams

Exams
50 - 70%

Other: Includes any assessment tools that do not logically fit into the above categories.

None

Other Category
0 - 0%

Representative Textbooks and Materials:

Stern's Introductory Plant Biology. 14th ed. Bidlack, James and Jansky, Shelley and Stern, Kingsley. McGraw-Hill Education. 2017

Botany: An Introduction to Plant Biology. 6th ed. Mauseth, James. Jones & Bartlett Publishers. 2016

Instructor prepared lab manual

Instructor prepared materials