BIOL-241: GENERAL BOTANY

Effective Term
Fall 2026

CC Approval
12/05/2025

AS Approval
12/11/2025

BOT Approval
12/18/2025

COCI Approval
02/26/2026

SECTION A - Course Data Elements

CB04 Credit Status
Credit - Degree Applicable

Discipline

Minimum Qualifications
Biological Sciences (Master's Degree)

Subject Code
BIOL - Biology
Course Number
241

Department
Biology

Division
Science and Engineering (SE)

Full Course Title
General Botany

Short Title
General Botany

CB03 TOP Code
0402.00 - Botany, General

CB08 Basic Skills Status
NBS - Not Basic Skills

CB09 SAM Code
E - Non-Occupational

Rationale
Update DEI.

SECTION B - Course Description

Catalog Course Description
An integrated study of contemporary plant biology and principles of ecology. The course includes the life cycles, anatomy, physiology, evolution and ecology of protists, fungi, and plants. Intended for biology majors.

SECTION C - Conditions on Enrollment

Open Entry/Open Exit
No

Repeatability
Not Repeatable

Grading Options
Letter Grade or Pass/No Pass

Allow Audit
Yes

Requisites

Prerequisite(s)
Completion of BIOL-120, CHEM-120 and a course taught at or above the level of intermediate algebra with a minimum grade of C or appropriate placement.

Requisite Justification

Requisite Description
Course in a Sequence

Subject
BIOL
Course #
120

Level of Scrutiny
Content Review

Upon entering this course, students should be able to:
1. Cell Theory
2. Membrane transport
3. Mendelian genetics
4. Metabolism
5. Biological macromolecule structure
6. Protein synthesis

Requisite Description
Course in a Sequence

Subject
CHEM
Course #
120

Level of Scrutiny
Content Review

Upon entering this course, students should be able to:
1. Cell Theory
2. Membrane transport
3. Mendelian genetics
4. Metabolism
5. Biological macromolecule structure
6. Protein synthesis

Requisite Description
Non-course Requisite

Level of Scrutiny
Communication/Computational Skill Required for Transfer

SECTION D - Course Standards

Is this course variable unit?
No

Units
5.00000

Lecture Hours
54

Lab Hours
108

Outside of Class Hours
108

Total Contact Hours
162

Total Student Hours
270

Distance Education Approval

Is this course offered through Distance Education?
Yes

Online Delivery Methods

DE Modalities	Permanent or Emergency Only?
Entirely Online	Permanent
Hybrid	Permanent
Online with Proctored Exams	Permanent

SECTION E - Course Content

Student Learning Outcomes

	Upon satisfactory completion of the course, students will be able to:
1.	Describe the basic anatomy of a flowering plant.
2.	Understand ecological adaptations in plant species that allow them to survive in their habitat.
3.	Relate principles of ecology and evolution to the distribution of species.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1.	Examine the basis of plant, fungal, and algal classification and outline the evolutionary relationships of the major taxonomic groups.
2.	Distinguish the life cycles of each organism studied.
3.	Examine and diagram the anatomy of each organism studied, including its cells, tissues, and organs.
4.	Describe the molecular basis of plant cell life, including metabolism, heredity, and nutrition.

5.	Identify the unique tissues important to plant development and discuss how each is specialized to perform its function.
6.	Describe the physiological basis of plant function including water relations, transport, and plant hormones.
7.	Define fundamental ecological principles such as habitat, niche, succession, and carrying capacity.
8.	Assess interactions between organisms and their abiotic and biotic environments at the population, community, and ecosystem levels.
9.	Critically evaluate experimental designs, scientific results and the broader impacts of scientific findings.
10.	Discuss how the study of botany is relevant to modern society in regard to agriculture, basic science, and ecology.

Course Content

1. Lecture
    a. Overview and Evolutionary History of Plants, Algae and Fungi
    b. The Plant Cell
    c. Molecular and Physiological Basis of Plant Function
        i. Respiration
        ii. Photosynthesis
        iii. Water
        iv. Soils
        v. Transport
        vi. Tropisms
        vii. Plant hormones
        viii. Nutrition
        ix. Cell cycle
        x. Inheritance
    d. Plant Morphology
        i. Plant tissues
        ii. Roots
        iii. Shoots
        iv. Secondary growth
        v. Leaves
        vi. Flowers
    e. Plant Development
        i. Embryo and seed formation
        ii. Germination
        iii. Development of the adult plant
    f. Classification and Evolution
        i. Phylogenetic principles
        ii. Protists
        iii. Fungi
        iv. Bryophytes
        v. Ferns
        vi. Gymnosperms
        vii. Angiosperms
        viii. Paleobotany
        ix. Evolution of angiosperms
        x. Coevolution
        xi. Speciation
    g. Reproduction and Life Cycles
        i. Asexual and sexual repro duction
        ii. Alternation of generations
    h. Ecological Principles
        i. Abiotic and biotic environments
        ii. Biomes
        iii. Habitat and niche
        iv. Adaptation
        v. Populations
        vi. Biological communities

vii. Trophic relationships
viii. Ecological succession
ix. Ecosystems

i. Plants and Humans
i. Agriculture
ii. Plant variation
iii. Biotechnology
iv. Ecological management and conservation

2. Laboratory
a. Plant Cellular Biology
i. Microscopic observation and structural analysis of plant tissues
ii. Plant tissue preparation: epidermal peels
iii. Stomatal density measurement and statistical analysis
iv. Florescence and electron microscopy theory and applications
v. Growth rate calculation in a monocot plant

b. Plant Anatomy and Histology
i. Sectioning and staining techniques
ii. Observation and identification of structural elements
1. roots
2. stems
3. leaves
4. flowers

3. Classification, Evolution and Life Cycles
a. Protists
b. Fungi
c. Bryophytes
d. Ferns
e. Gymnosperms
f. Angiosperms

4. Physiology
a. Experiment: Temperature effect on yeast growth

5. Field Studies
a. Field trip to local nature reserve
b. Germination and cultivation projects in the college greenhouse and garden

6. Ecology and Applications
a. Analysis of plant adaptive strategies
b. Applications of mathematical models in ecology
c. Environmental and genetic variation: discussion, lab and field observations
d. Plant domestication and breeding programs
e. Comparison of agricultural plants and their wild progenitors: garden project
f. Speciation: literature review and discussion.

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Discussion	Instructor and student-led discussions of reading assignments.
Field Trips	Class field trips to local habitat areas and botanical preserves.
Lab	Observation, analysis and experiments conducted in the laboratory and garden/ greenhouse facilities.
Lecture	Spoken lectures with visual media and interactive discussion.
Observation and Demonstration	Instructor-led demonstrations in the laboratory.

Online Adaptation

Types	Examples of learning activities
Activity	
Directed Study	

Discussion
Group Work
Individualized Instruction
Journal
Lecture

Instructor-Initiated Online Contact Types

Announcements/Bulletin Boards
Chat Rooms
Discussion Boards
E-mail Communication
Telephone Conversations
Video or Teleconferencing

Student-Initiated Online Contact Types

Chat Rooms
Discussions
Group Work

Course design is accessible

Yes

Methods of Evaluation

Methods of Evaluation

Types	Examples of classroom assessments
Exams/Tests	Midterm exams consisting of multiple choice, short answer, and essay questions on material covered in the lectures. Example: Lecture Exam 1 will cover aspects of plant cellular biology as well as physiological topics including water relations, hormones, and nutrition. Laboratory exams consisting of identification of plant specimens, tissues and anatomical structures. Example: Laboratory Exam 2 will cover identification of plant tissues in roots, shoots, and organs containing secondary growth. Final Exam -- Cumulative review of material in the form of short answer, essay, illustration, and fill-in-the-blank questions.
Projects	Research paper or presentation on a contemporary topic in plant biology.
Lab Activities	Assessment of microscopy drawings and tissue labeling. Progress evaluations on laboratory manual. Discussion of post-lab questions.

Assignments

Reading Assignments

Reading assignments from the textbook, laboratory manual, and supplemental primary literature.

Example 1: Read Chapters 16 and 17 of the textbook as preparation for the lecture on bryophytes and seedless vascular plants.

Example 2: Read Exercise 14 in the laboratory manual and the introduction and methods section of the scientific article provided prior to doing laboratory exercise 14 on flowers.

Writing Assignments

Laboratory reports, research paper, grant proposal

Example 1: Craft a research grant proposal justifying your choice for plant species to be included in the community garden. Focus on experimental possibilities and the broader impacts of your selection.

Example 2: Outline your research paper using the experiment and statistical tests covered in lab today, focusing on your hypothesis evaluation in the discussion.

Outside-of-Class Assignments

Plant collections, garden/greenhouse work, independent research project, group discussion.

SECTION F - Textbooks and Instructional Materials

Material Type

Textbook

Author
Evert, R.F., S.E. Eichhorn

Title
Raven Biology of Plants

Edition/Version
8th

Publisher
W.H. Freeman and Co.

Year
2013

Material Type
Textbook

Author
Evert, R.F., S.E. Eichhorn, J. Perry

Title
Laboratory Topics in Botany

Edition/Version
8th

Publisher
W.H.Freeman and Co.

Year
2013

Material Type
Textbook

Author
McMahon, M., J.

Title
Plant Science: Growth, Development, and Utilization of Cultivated Plants

Edition/Version
6th

Publisher
Pearson

Year
2020

SECTION G - Diversity, Equity and Inclusivity

How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?

This course supports diverse student populations through the use of multiple representations of concepts, varied applications, and technology. Strategies may also include collaborative learning, transparent assessment practices, low-cost resources, and opportunities for students to connect course material to their own experiences, fostering equitable outcomes and an inclusive classroom environment.

Course Codes (Admin Only)

CB00 State ID

CCC000235297

CB10 Cooperative Work Experience Status

N - Is Not Part of a Cooperative Work Experience Education Program

CB11 Course Classification Status

Y - Credit Course

CB13 Special Class Status

N - The Course is Not an Approved Special Class

CB23 Funding Agency Category

Y - Not Applicable (Funding Not Used)

CB24 Program Course Status

Program Applicable

Allow Pass/No Pass

Yes

Only Pass/No Pass

No