

JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Botany

Course Abbreviation and Number: BIO 2670

Credit Hours: 4

Course Type: Lecture/Lab

Course Description: Using a classical taxonomic study of the botanical realm, students will gain an understanding of bacteria, phytoprotists, fungi, and the true plants, and explore the ecological, evolutionary, and economic significance of these organisms. Emphasis is placed on the morphology, anatomy, physiology, behavior, and ecology of botanical organisms through the study of cells, tissues and organs, life cycles and reproductive strategies, evolutionary relationships and trends, taxonomic classification, and related contemporary issues. Laboratory includes off-campus field trips and outdoor fieldwork assignments.

Prerequisite: ENG 1510 and BIO 1551+BIO 1552 or BIO 1570 or BIO 1580.

General Education Requirements Met

SUNY

Natural Sciences

JCC

Scientific Reasoning

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Compare, contrast, and distinguish between the major reproductive strategies and structures of major groups of the true plants, including the mosses, ferns, cycads, conifers, and flowers, emphasizing the evolutionary trends and advancements in form and function which distinguish each group, with particular attention to the complex pollination and dispersal strategies of the flowering plants
2. Utilize the taxonomic hierarchy (domain, kingdom, division, class, order, family, genus, species) in reference to botanical organisms studied throughout the course
3. Distinguish between the two major prokaryote domains, the bacteria and the archaea, and between prokaryotic and eukaryotic organisms, and cite structural aspects, specific examples, and roles played by each
4. Identify and describe numerous beneficial ecological, commercial, medicinal, and other contributions made by various botanical organisms
5. Identify and evaluate general tenets of the evolutionary theory as it applies to botanical organisms and current biological understanding of life on earth
6. Properly identify the specific cells, tissues, reproductive organs, and other distinctive anatomical structures of the major botanical taxa, including the mosses, liverworts, ferns and allies, conifers and other gymnosperms, and the flowering plants, and cite the specific function(s) of each
7. Differentiate between primary and secondary growth and differentiated tissues in plants
8. Describe the general nature of alternation of generations in plants, and characterize the gametophyte and sporophyte generations of mosses, liverworts, ferns, conifers, and flowers
9. Characterize, compare, and contrast the co-evolutionary adaptations typical of flowers in relation to their specific pollinators (wind, bees and wasps, birds, butterflies, moths, bats, beetles, flies, ants, and others), and describe the significance of the sexual encounters of the floral kind
10. Describe and discuss the diversity of plant responses to specific environmental cues such as photoperiod, light intensity and quality, water availability, gravity, temperature, attack by herbivores, and other stimuli, and describe their significance to survival
11. Characterize and distinguish among the various phytohormones of higher plants (auxins, gibberellins, cytokinins, ethylene, and abscisic acid), and describe the known functions of each
12. Utilize and apply the methods of science to analyze problems and observations, make predictions, interpret evidence, and draw conclusions from data
13. Work independently and collaboratively within teams in laboratory and in the field, to accomplish a variety of laboratory and field-based projects and activities
14. Demonstrate proficiency in the use of microscopy, including oil immersion microscope techniques, for the examination and identification of botanical specimen
15. Demonstrate proficiency in the identification of the major woody coniferous and flowering trees, herbaceous wildflowers, ferns, and other botanical organisms of our local area, using field guides, dichotomous keys, and

other identification techniques, and report findings using proper taxonomic designations, in the form of tables, descriptive writings, and a comprehensive botanical journal laboratory project.

16. Demonstrate an understanding of the methods scientists use to explore natural phenomena, including observation, hypotheses development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling. [SUNY Gen Ed – Natural Sciences]
17. Application of scientific data, concepts, and models in one of the natural sciences. [SUNY Gen Ed – Natural Sciences]

Topics Covered:

- Introduction to Botany
- Classification of Living Things
- The Prokaryotes – bacteria and archaea
- Unicellular autotrophic protists - morphology, pigments, distinguishing characteristics, ecology and commercial roles, representative examples, evolutionary theory of origins
- Fungal-like protists
- Multicellular algae – morphology, pigments, distinguishing, structures, habitat, ecological and economic roles, representative examples, selected life cycles, evolutionary considerations
- Kingdom Fungi – morphology, distinguishing structures, ecological and economic roles, representative examples, selected life cycles, fungal diseases
- Divisions Bryophyta, Hepatophyta and Anthocerotophyta – mosses, liverworts, and hornworts
- Seedless vascular plants – Division Pterophyta and allies - the ferns and their relatives, extinct and extant
- Seed Plants I – the gymnosperms – Divisions Gnetophyta, Ginkgophyta, Cycadophyta, and Coniferophyta
- Seed plants II – the angiosperms - Division Anthophyta (Magnoliophyta)
- Evolution of the flowering plants
- Plant growth and development; cells and tissues of the vascular plant body
- The root – primary structure and development
- The shoot – primary structure and development
- Woody dicot stem – secondary structures of wood and bark
- Growth regulation and developmental control
- External factors – plant responses to environmental stimuli

Information for Students

- Expectations of Students
 - [Civility Statement](#)
 - [Student Responsibility Statement](#)
 - [Academic Integrity Statement](#)
- [Accessibility Services](#)

Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- [Get Help: JCC & Community Resources](#)
- [Emergency Closing Procedures](#)
- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
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- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

Effective Date: Fall 2023