



蘇州大學  
Soochow University

## **BIO 225 Plant Science Basics**

**Summer 2024**

**Course Credits:** 4

**Contact Hours:** 56 hours

**Instructor:** TBA

**Email:**TBA

### **COURSE OBJECTIVES**

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This course provides an overview of the fundamental concepts and principles underlying the biology and physiology of plants. Through a combination of lectures, and laboratory exercises, students will explore the structure, function, and diversity of plants, as well as their ecological significance and applications in biotechnology. Topics include plant cells, roots, stems, leaves, and flowering plant structures, as well as models of leaf and cell morphology. Additionally, students will learn about plant growth principles, pollination, evolution, physiology, metabolism (including photosynthesis, respiration, and transpiration), signal transduction, development, reproduction, ecology, and biotechnology.

Upon Completion of this Course, students will be able to:

1. Understand the basic structure and function of plant cells, roots, stems, leaves, and flowering plant structures;
2. Recognize and interpret models of leaf and plant cell morphology;
3. Gain knowledge of plant growth principles, including factors influencing growth and development;
4. Explore the process of pollination and its significance in plant reproduction;
5. Examine the evolution, physiology, and anatomy of plants, including metabolic processes such as photosynthesis, respiration, and transpiration;
6. Understand the mechanisms of signal transduction in plants.

### **PREREQUISITES**

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BIO 105 Organismal Biology



## GRADING

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Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
5 Lab Reports	30 Points
4 Assignments	20 Points
Midterm Exam	25 Points
Final Exam	25 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

## COURSE MATERIALS

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### Required Texts:

James D. Mauseth, *Botany: An Introduction to Plant Biology*(5th ed), 2016, Jones and Bartlett Publishers, Inc.

### Recommended (Optional) Texts or Other Materials:

None

## COURSE TOPICS

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MODULE	TASKS
Module 1	<p><b>Topics:</b> Topic 1: Plant Cell Structure and Function Topic 2: Root Anatomy and Function Topic 3: Stem Structure and Function Topic 4: Leaf Morphology and Photosynthesis</p> <p><b>Assessments:</b> Lab Report #1: Microscopy Observation Assignment #1</p>



Module 2	<p><b>Topics:</b> Topic 5: Flower Structure and Pollination Mechanisms Topic 6: Plant Leaf Models Topic 7: Plant Cell Models Topic 8: Principles of Plant Growth</p> <p><b>Assessments:</b> Lab Report #2: Growth Rate Measurement Assignment #2</p>
Module 3	<p><b>Topics:</b> Topic 9: Evolution of Plant Diversity Topic 10: Plant Physiology Concepts Topic 11: Plant Anatomy Concepts Topic 12: Photosynthesis and Cellular Respiration</p> <p><b>Assessments:</b> Lab Report #3: Fossil Analysis and Phylogenetic Reconstruction Midterm Exam</p>
Module 4	<p><b>Topics:</b> Topic 13: Transpiration in Plants Topic 14: Plant Signaling Pathways Topic 15: Plant Development and Reproduction Topic 16: Ecology of Plants</p> <p><b>Assessments:</b> Lab Report #4: Hormone Response Assays Assignment #3</p>
Module 5	<p><b>Topics:</b> Topic 17: Plant Biotechnology: Introduction Topic 18: Genetic Modification of Plants Topic 19: Plant Tissue Culture Topic 20: Plant-Pathogen Interactions</p> <p><b>Assessments:</b> Lab Report #5: Agrobacterium-Mediated Plant Transformation Assignment #4 Final Exam</p>

## ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow



University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

### **LEARNING REQUIREMENTS**

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

### **TECHNOLOGY POLICY**

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

### **ACADEMIC INTEGRITY POLICY**

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.



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## **DISABILITY ACCOMMODATION**

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Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.