

## Principles of Botany

11:776:210 (3 credits)

Fall Semester (yearly)

Monday, Wednesday (lecture) 9:15 – 10:55 AM 191B Foran Hall

### CONTACT INFORMATION

Instructor: Dr. Albert Ayeni  
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Office Hours: Monday, Wednesday, 3:00 to 4:30 p.m.

### COURSE DESCRIPTION

This course focuses on introductory plant biology as a fundamental element of understanding the plant from structural and functional perspectives. It defines a plant and introduces it as an essential component of the environment highlighting its roles in stabilizing human existence. It describes the plant from the cellular to the mature growth stages drawing the student's attention to the relationship between structure and function of various components including the micro- and macroscopic elements. The fundamentals of plant anatomy, metabolism, physiology, and development are covered drawing examples primarily from flowering plants (angiosperms). The evolutionary and ecological relationships among various plant groups (non-vascular/vascular and non-flowering/flowering plants) are described. Class presentations are required that give students the opportunity to express their understanding of a topic of interest selected from among several options suggested at the beginning of class.

### COURSE WEBSITE, RESOURCES AND MATERIALS

- Course website: Sakai; class lectures, announcements, and Q&A will be posted regularly throughout the semester
- Recommended texts: Lectures will be based on current scientific information drawn from recent botany and plant biology texts, reputable journal articles, and credible/authoritative Internet websites. Textbooks to be consulted include:
  - Graham, LE, JM Graham, LW Wilcox. 2006. Plant Biology, 2<sup>nd</sup>. Pearson Prentice Hall, Upper Saddle River, NJ (primary textbook)
  - Nabors, MW. 2004. Introduction to Botany. Pearson Benjamin Cummings Publishers, New York
  - Uno, G, R Storey, R Moore. 2001. Principles of Botany. McGraw Hill, Boston Burr Ridge, IL
  - Stern, KR, JE Bidlack, SH Jansky. 2008. Introductory Plant Biology, 11<sup>th</sup>. McGraw Hill Higher Education, New York
- These texts will be placed on reserve at Chang Library in Foran Hall

### PREREQUISITE

None

### COURSE LEARNING GOALS

(Link to Plant Biology Undergraduate Program Goals: <http://plantbiology.rutgers.edu/undergrad/plantbiology/>)

By the end of this course, the student will be able to:

1. Recognize the role of plants as energy sources for living things including humans (addresses program learning goal 2)
2. Apply the fundamentals of plant anatomy, physiology, and morphology to the classification of members of the Plant Kingdom into non-vascular/vascular plants and non-flowering/flowering plants (addresses program learning goal 1)
3. Comprehend the relationship between plant structure and function (addresses program learning goal 1)

4. Describe the evolutionary and ecological relationships among various plant groups (addresses program learning goal 3)

## ASSIGNMENTS/RESPONSIBILITIES AND ASSESSMENT

### Grading

Grades will be determined based on class participation and attendance (10%), mid-term and final exams (30% each), and class presentation (30%). Examinations are composed of short answer (e.g., true-false, multiple choice, short essay) questions.

Grades will be classified based on Rutgers approved system: A, B+, B, C+, C, D, and F.

**Class presentation:** Student teams (3 to 5 students per team), will form early in the semester. Each team will grow a selected plant in the greenhouse and give a presentation on the growth habit of the plant from germination to fruiting. The presentation constitutes 30% of the final grade.

**Learning goals assessment:** Specific questions on exams and the end of semester in-class presentation will be used to assess student knowledge of course learning goals, including demonstrated mastery of fundamental terms, processes, and relationships. In particular, students will describe the evolutionary and ecological importance of plants (learning goal 4) in class presentations. The percentage score on these assessments will determine the level of mastery: >90% outstanding; 80-89% good; 70-70% satisfactory; <69% unsatisfactory.

## PARTICIPATION GRADE AND ABSENCE POLICY

Class participation is essential in this course: students are expected to attend all classes; attendance and class participation constitutes 10% of final grade.

Students who expect to miss class may contact the instructor via e-mail prior to the missed class or may use the University absence reporting website (<https://sims.rutgers.edu/ssra/>) to indicate the date and reason for the absence. An e-mail is automatically sent to the instructor.

## COURSE SCHEDULE

Lecture	Topic
1	Introduction: What is Botany? What is a plant? Plant role in human life, scientific communication in Botany
2	The plant cell: structure (cell wall, cell membrane, cytoplasm, vacuole, organelles, nucleus)
3	Cell division: somatic cells
4	Cell division: reproductive cells
5	Cell differentiation: simple/primary tissues
6	Cell differentiation: complex/secondary/permanent tissues
7	Plant metabolism: energy dynamics
8	Plant metabolism: photosynthesis
9	Plant metabolism: respiration
10	Plant growth and development: germination and seedling growth
11	Plant growth and development: response to stress factors
12	Plant parts: root structure and function
13	Plant parts: stem structure and function
14	Plant parts: leaf structure and function
	<b>Mid-term exam (30%)</b>
	<b>Thanksgiving recess</b>
15	Plant parts: flower structure and function

Lecture	Topic
16	Plant parts: fruit structure and function
17	Plant parts: seed/grain structure and function
18	Plant reproduction: sexual and asexual
19	Plant evolution: prokaryotes and eukaryotes
20	Plant classification: non-vascular and vascular plants
21	Plant classification: non-flowering and flowering plants
22	Greenhouse tour
	<b>Final exam (30%)</b>
23	Class presentation
24	Class presentation
25	Class presentation
26	Class presentation

### FINAL EXAM/PAPER DATE AND TIME

The final exam is in-class and constitutes 30% of the total grade.

### ACCOMODATIONS FOR STUDENTS WITH DISABILITIES

Please follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full policies and procedures are at <https://ods.rutgers.edu/>

### ACADEMIC INTEGRITY

The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu/academic-integrity-policy/>

The principles of academic integrity require that a student:

- Properly acknowledge and cite all use of the ideas, results, or words of others.
- Properly acknowledge all contributors to a given piece of work.
- Make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- Obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- Treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- Uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that:

- Everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- All student work is fairly evaluated and no student has an inappropriate advantage over others.
- The academic and ethical development of all students is fostered.
- The reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

## STUDENT WELLNESS SERVICES

### **Just In Case Web App** <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

### **Counseling, ADAP & Psychiatric Services (CAPS)**

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ [www.rhscaps.rutgers.edu/](http://www.rhscaps.rutgers.edu/)

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

### **Violence Prevention & Victim Assistance (VPVA)**

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / [www.vpva.rutgers.edu/](http://www.vpva.rutgers.edu/)

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

### **Disability Services**

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

### **Scarlet Listeners**

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.