Instructor

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Office hours: Wed 10:30 – 11:30 am or by appointment

BOT3503 Physiology and Molecular Biology of Plants

Spring, 2026
Lecture: M,W,F | Period 3 (9:35 AM - 10:25 AM)
Weil Hall (WEIL) 0273

Why is learning plant physiology important? Plant physiology is the study of plant function and behavior. To understand plant processes, a student must integrate concepts from molecular and cell biology, chemistry, and physics. Through the study of plant physiology, you will uncover links between plant structure and function and further your understanding of plant responses to their biotic and abiotic environment. Such knowledge provides a conceptual basis for the improvement of crops and the maintenance of other plant ecosystem services.

This course aims to help students understand plant processes in agronomic and environmental contexts including

1) Cell wall and membrane structures and functions;
2) Water and nutrient transport;
3) Gene expression and signal transduction;
4) Energetics, enzymes, and biochemical reactions;
5) Photosynthesis and respiration;
6) Growth, morphogenesis, and flowering;
7) Hormones and light responses;
8) Stress responses

Further, our course will help you develop skills in

1) Reading comprehension;
2) Critical thinking;
3) Oral and written communication

Specific learning outcomes

After you have completed this class, you will be able to:

1) Define characteristics that differentiate plants from animals;
2) Describe the structure and biochemistry of plant cell walls and membranes;
3) Discuss the physical properties that enable plant water transport;
4) List and describe the function of plant macro and micronutrients;
5) Explain signal transduction and the importance of gene expression in plant performance;
5) Outline and describe the biochemical pathways for photosynthesis and respiration;
6) Outline and describe the fundamental processes involved in the complete plant life cycle;
7) List and describe the function of key plant hormones;
8) Describe photochemical signals involved in plant growth and phenology;
9) Make predictions of plant behavior under water, light, nutrient, and herbivore stress

Texts

The primary text for this class is *Fundamentals of Plant Physiology* (1st edition) by Taiz et al., 2018. This is an introductory text that is succinct and easy to read with excellent artwork.
(For a more comprehensive text, you may instead use *Plant Physiology and Development* (7th edition) by Taiz et al., 2014. This original text is more advanced, but follows the same structure as the fundamentals text above. I strongly recommend the advanced text for graduate students and those interested in pursuing a career in plant science.)

Course grades will be determined as follows:
The course grade is determined from three exams, in-class questions, and homework assignments.

Grading scale:
90 – 100% = A
80 – <90% = B
70 – <80% = C
60 – <70% = D
below 60% = E

Exams*:* Examinations are primarily based on the material covered during class, but the text provides additional information for those that want or need background information. Memorization and regurgitation of facts is not a good strategy for success in the course. The three exams consist of short answer questions relating to the lecture and reading assignments and will require problem solving and synthesis of concepts. They will be taken during the regular class periods. Each exam is worth 100 points. A grade rubric will be provided when exams are returned.

Assignments and in-class questions: Students will answer questions during class. These questions are based on participation and cannot be submitted asynchronously (i.e., you must be in class to receive credit). You will also complete nine at-home problem sets through Canvas that will be evaluated on accuracy. This work will total 100 points.

Course Policies:

The course meets from 9:35 a.m. to 10:25 a.m. (period 3) on Monday, Wednesday and Friday in Weil Hall 0273. Students are expected to complete readings before class, attend lectures and interact during class (questions during lecture are encouraged).

Attendance and make-ups
Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Accommodations
Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. Note that the student should provide documentation of a requirement for accommodation by the second week of classes. No accommodations are available to students who lack this documentation. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

Course Evaluations
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/ .

Academic Integrity
"UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University

of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honorcode/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Important – Plagiarism

Plagiarism is a serious violation of the Student Honor Code. It includes:

- Submitting all or part of someone else's work as if it is your own
- "Borrowing" without crediting the source
- Submitting duplicate assignments
- Collaborating or receiving substantive help in writing your assignment unless we require such collaboration as part of the work
- Failing to cite sources, or citing them improperly

Consequences of plagiarism:

- Failing grade on assignment AND
- Course grade penalty of one letter grade AND ● Report to the Office of the Dean of Students.

Please review plagiarism and how to avoid it: http://web.uflib.ufl.edu/msl/07b/studentplagiarism.html

Resources Available to Students

Health and Wellness

- *U Matter, We Car*e: umatter@ufl.edu; 392-1575
- *Counseling and Wellness Center*: http://www.counseling.ufl.edu/cwc/Default.aspx; 392-1575
- *Sexual Assault Recovery Services (SARS)*: Student Health Care Center; 392-1161
- *Career Resource Center*, Reitz Union, 392-1601, career and job search services.
- *University Police Department*: http://www.police.ufl.edu/; 392-1111 (911 for emergencies)
- Many students experience test anxiety and other stress – related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall; 392-1575) and at their web site: http://www.counsel.ufl.edu/.

Academic Resources

- *E-learning technical support*: Learningsupport@ufl.edu; https://lss.at.ufl.edu/help.shtml; 352-392-4357 (opt. 2)
- *Career Resource Center*: Reitz Union; http://www.crc.ufl.edu/; 392-1601
- Library Support: http://cms.uflib.ufl.edu/ask
- Teaching Center: Broward Hall; 392-2010 or 392-6420
- Writing Studio: 302 Tigert Hall; http://writing.ufl.edu/writing-studio/; 846-1138

Procedure for Conflict Resolution

Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact the Undergraduate/Graduate Coordinator or the Department Chair. Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (http://www.ombuds.ufl.edu; 392-1308) or the Dean of Students Office (http://www.dso.ufl.edu; 392-1261). For further information refer to https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (for residential classes) or http://www.distance.ufl.edu/student-complaintprocess (for online classes).

Tentative course schedule

Date	Discussion Topics	Chapter
UNIT 1		
Jan 12	Introduction: What is a plant?	
Jan 14	Water and Plant Cells	2
Jan 16		
Jan 19	NO CLASS – Martin Luther King Jr. Day	
Jan 21		
Jan 23	Plant Water Balance	3
Jan 26		
Jan 28		
Jan 30		
Feb 2	Solute Transport	6
Feb 4	Mineral Nutrition	4
Feb 6		
Feb 9	Nitrogen, Phosphate, and Iron Assimilation	5
Feb 11		
Feb 13	**EXAM 1**	2-6
UNIT 2		
Feb 16	Photosynthesis: light reactions	7
Feb 18		
Feb 20		
Feb 23	Photosynthesis: carbon reactions	8
Feb 25		
Feb 27	Ecology and Photosynthesis	9
Mar 2		
Mar 4		
Mar 6		
Mar 9		
Mar 11	Phloem Transport	10
Mar 13	Guest Lecture	
Mar 16	NO CLASS—Spring Break	
Mar 18	NO CLASS—Spring Break	
Mar 20	NO CLASS—Spring Break	
Mar 23	Respiration and Lipid Metabolism	11
Mar 25	**EXAM 2**	7-11
UNIT 3		
Mar 27	Whole Plant Growth	16
Mar 30		
April 1	Plant signaling and hormones	12
April 3		
April 6		
April 8		
April 10		
April 13	Plant responses to light	13
April 15		
April 17	Seed dormancy, germination and seedling establishment	15
April 20	Flowers, Fruits, and Seeds	17, 18, 20
April 22	**EXAM 3**	12-18, 20