HOS6307 – Horticultural Physiology

Fall 2025
3 credits
99% online synchronous

Meeting Times and Locations

Monday and Wednesday	9:35 AM to 10:25 AM (3rd period)
	Zoom link for lecture
Friday	9:35 AM to 11:30 AM (3rd and 4th period)
	Zoom link for journal club with Dr. Nunez
	Zoom link for journal club with Dr. Vincent

Course Format

This is a 99% online, synchronous course. Course lectures and interactive activities will take place during our scheduled meeting time (see above). Attendance is mandatory, but lecture videos will be published as an additional tool to supplement student learning. Links and all other learning materials will be published in Canvas. This course also includes a weekly online journal club. There will be a live hands-on training on 11/10.

Instructors

Gerardo Nunez, Ph.D.

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Fifield Hall 1113

(352) 273 - 4765

Office hours: Wednesdays 4:00 PM to 5:00 PM in person or via Zoom

Christopher Vincent, Ph.D.

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(863) 956 - 8757

Office hours: Mondays 1:00 PM to 2:00 PM via Zoom

Pre-Requisite Knowledge

Students are expected to be familiar with plant anatomy and morphology at the start of this course. Most undergraduate plant physiology/anatomy courses deliver this pre-requisite knowledge. Additionally, students are expected to have experience reading primary research literature and performing basic data analysis (t-tests or one-way ANOVA).

Course Description

This course covers basic plant physiology concepts with an emphasis on horticultural crops. Topics include water uptake and transport, ion uptake, photosynthesis, respiration, and source-sink relations.

Course Learning Objectives

Upon successful completion of this course, students will be able to:

- Summarize the physical and biological principles by which horticultural crops take up and transport water and ions
- Summarize the photochemical and biochemical phenomena that mediate carbon and energy flux in photosynthesis and respiration in horticultural crops
- Evaluate how environmental factors and horticultural practices impact water and nutrient uptake, photosynthesis, respiration, and - ultimately - horticultural productivity
- Interpret and diagram horticultural crop physiology data and write scientific reports
- Write an article review that demonstrates a thorough understanding of plant physiology concepts, skillful use of academic language, and collegiality and the ability to provide positive feedback.
- Moderate a journal club discussion about a recently published horticultural physiology article.

Course Materials

Textbooks

There is no required textbook for this course. The following textbook can be used to supplement and extend lecture topics.

- Fundamentals of Plant Physiology Taiz, Zeiger, Moller, & Murphy (ISBN 9781605357904)

Course Website

This course has a comprehensive mini-site in canvas. Take time to familiarize yourself with the “Start Here”, “Syllabus”, and module tabs in the navigation menu. Digital copies of this syllabus, and other learning materials can be found there.

- *E-Learning in Canvas*, www.elearning.ufl.edu

Technology

This is an online course. Thus, access to reliable technology is paramount to student success. You will need to have access to a personal computer, web camera, and microphone to attend lectures,

participate in class, and take exams. **Your camera must be turned on for the duration of class.** Please, be mindful of your appearance, privacy, and surroundings.

You will also need to have access to broadband internet. Your internet connection should allow for a smooth web conference experience or smooth video playback. If you have trouble streaming videos (e.g., from Hulu or Netflix) on your WiFi connection, you will not be able to take an online exam. Mobile phones ("Hot Spots" or data) are almost certainly not a good idea.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Attendance and Participation

Students are encouraged to attend every class. Attendance will be taken based on the screen name you use in Zoom. Your screen name must be your first name and last-name initial (for example, my screen name will be Gerardo N.). For additional help on how to customize your Zoom profile, see this resource:

- *Customizing your profile,* https://support.zoom.us/hc/en-us/articles/201363203-Customizing-your-profile

Absences will be excused, late assignments will be graded, and make up-exams will be provided for documented emergencies as per UF's attendance policy. However, I am aware that sometimes life throws you a *curve ball*. Thus, you are allowed one no-questions-asked absence per semester. You cannot use your no-questions-asked absence on a date when exams, journal club discussions, or assignments are due. Subsequent unexcused absences will make you ineligible for all extra credit assignments.

Additional information about UF's attendance policy can be found here:

- *Attendance policy*, www.catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

This course requires active student participation. Students are expected to participate by asking and answering questions during lecture, as necessary. Also, there will be multiple, non-graded activities that provide opportunities for additional engagement. In most lectures, students will be invited to answer online prompts (delivered through QR codes that link to polleverywhere.com) using their cellular phones or other mobile devices. Students are expected to participate in these polls and discuss their answers with the whole class or in breakout groups.

Zoom Etiquette

Students are expected to be respectful learners. As such, you should arrive to and leave from class on time. Students who arrive 5+ minutes after the start of class will not be allowed into the Zoom call. You microphone must be muted upon joining the Zoom room. Your camera must be turned on for the duration of our class, but your microphone can be muted. You should be ready to answer questions

using your microphone. The chat feature must be used exclusively for course-related communication. Links and files should be shared and transferred using Canvas and email as appropriate (Zoom is not an acceptable method for assignment submission).

Communication Guidelines

Email

Email will be the main means of communication between us. Hence, it is critical that all course-related emails are polite, professional, and as different from a text message as possible. You must use your Gator Link email. Canvas messages will not be answered. For additional recommendations, consult:

- *Email etiquette*, https://www.inc.com/business-insider/email-etiquette-rules.html

Response Time and Feedback

I will reply to course emails within 48 hours of receiving them (barring for an emergency). If your email is time-sensitive (for example, an issue with a timed assignment), please indicate "Time sensitive" in the email subject line. I will make every attempt to respond to time sensitive emails received during business hours in a timely manner.

Exams and homework will be graded within 14 days of the assignment closing. Since both kinds of assignments are due at the end of each module, I will prioritize exams over homework. I use assignment rubrics and the comments section to provide positive and formative feedback about student answers. Once a grade is posted, I recommend you review your submission to find my feedback. If you have additional questions about your submission, please do not hesitate to visit me during office hours.

Challenging a Grade

All discrepancies in grading must be resolved within 7 days of the grade being posted in canvas. The instructor's memory is frail. Thus, grade disputes older than 7 days old will not be entertained unless proper excuse is provided (see attendance policy).

Written Communication

Effective written communication is essential for student and professional success. Whether you go on to become a horticulturist, an accountant, or a CEO, written communication will be a critical skill in your toolbox. Thus, I place great emphasis on coaching and participating in professional, context-specific written communication. Proper spelling, grammar, and punctuation are expected in all course assignments. You are encouraged to use the resources provided by the UF Writing Studio to develop or enhance your writing skills. Free one-on-one tutoring (live and on-line) is available to enrolled students.

- *UF Writing Studio*, 302 Tigert Hall, 846-1138**,** www.writing.ufl.edu/writing-studio/

Course Grading Structure

1. Exams (45 points)

The purpose of these assessments is to evaluate students' knowledge, critical thinking, and writing ability. Students will be evaluated through three cumulative exams administered in Canvas with HonorLock. Each exam will be graded out of 15 points. Exams will include short- and long-answer questions focused on the most-recent 5 weeks of lecture material and journal club discussions. Exams will be open for 24 hours starting at 10:25 AM on the dates indicated below. Exam #3 will take place during finals week at the time indicated by the University Registrar. Practice exams will be available a week before each exam. Students can track their learning in each module using the provided practice exam and practice exam answers.

Exam	Opens
Exam #1	10/01/25
Exam #2	10/29/25
Exam #3	12/10/25

Students will have the option of adding +1.5 extra credit points to their exam #1 and exam #2 grades if they improve and re-write their answers to the long-answer question in each exam within 48 hours of receiving their exam scores. Extra credit points will be assigned to perfect and near-perfect answers. No partial credit will be given in the extra credit assignment. Students who choose not to complete the extra credit will neither receive points nor be penalized.

2. Homework (30 points)

The purpose of these assignments is to connect experimental data with plant physiology concepts and scientific writing. Students will receive data from a simple experiment. Then, they will analyze the data using statistical software, illustrate the data as publication-ready graphs, and summarize their findings in a brief (~200 words) scientific report. Students can refer to personal notes, textbooks, online tutorials, and other sources, but they must work individually. I will demonstrate how to analyze similar data with the help of ChatGTP and R scripts, but students can use any software they prefer.

Homework assignments will be submitted through Canvas and processed with originality-checking software. There will be three homework assignments in the semester; each will be graded out of 15 points. The two highest scores from each student will be used to compute the homework final grade.

Exam	Due date
Homework #1	09/29/25
Homework #2	10/27/25
Homework #3	12/03/25

3. Journal club (25 points)

The purpose of this exercise is to expose students to the plant physiology research environment (journals, methods, approaches, etc.), practice clear and effective communication, and expand on the knowledge covered during lectures. We will focus on whole-plant physiology articles published in reputable, peer-reviewed journals (e.g. JASHS, Tree Physiology, PCE, JXB etc.) within the past five years. The instructor will provide a list of articles that will be discussed during the semester. Students will select an article and date to moderate the discussion. Moderators will:

a. Prepare a presentation where they share the strengths and weaknesses of the article at hand. Moderators must understand and be ready to explain every aspect of the article.
b. Lead the academic debate about this article. Moderators must be ready to ask and answer questions from/to the instructor and classmates.
c. Grade their classmates' article evaluations within 7 days of their journal club presentation. A simple grading rubric will be provided.

All students will prepare a 500-word written valuation and 3 questions about each article we read during the semester. Both moderators and discussants will participate in the oral discussion of the article. Submitting text produced by generative IA tools, such as ChatGTP, is strictly forbidden. A total of 25 points can be earned from the journal club assessment:

Role	Item	Points possible
Moderator	Presentation	10 points
Everyone	Article evaluations	5 points
Everyone	Article discussions	10 points

4. In-person Training (+5 points)

We will have an in-person training on Monday, November 10th. The training will be held face-to-face in HortTeach 131 at UF Main Campus in Gainesville, FL. Infrared gas analyzers (IRGA) are ubiquitous in plant biology research. Unfortunately, using them is complicated and they are prone to errors and inaccuracies. In this training, we will use IRGAs and plants subjected to different forms of stress to learn to calibrate, use, and interpret photosynthesis and respiration data.

Grading Scale

Grade	Points	Percentage
A	92 – 100	92 – 100
A-	< 92 - 90	< 92 - 90
B+	< 90 - 87	< 90 - 87
B	< 87 - 83	< 87 - 83
B-	< 83 - 80	< 83 - 80

Grade	Points	Percentage
C+	< 80 - 77	< 80 - 77
C	< 77 - 73	< 77 - 73
C-	< 73 - 70	< 73 - 70
D+	< 70 - 67	< 70 - 67
D	< 70 - 67	< 70 - 67
D-	< 67 - 63	< 67 - 63
S	< 60	< 60

Grading Policy

Course grading is consistent with UF grading policies.

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact UMatterWeCare for additional and immediate support.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Weekly Course Schedule

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Week of	Topic	Assessment	Due date
	Module 1: Plant-water relations		
Aug 22	Introduction to the course		
Aug 25	Plant cells, tissues, and organs		
Sep 01	Water potential and stomatal function		
Sep 08	Long distance water movement and transpiration		
Sep 15	Daily transpiration patterns Factors affecting transpiration		
Sep 22	Ion movement across the plasma membrane Isohydric and anisohydric plants	Homework #1	09/29/25
	Module 2: Photosynthesis		
Sep 29	Light-dependent reactions of photosynthesis	Exam #1	10/01/25
Oct 06	CO_2 fixation reactions (C3)		
Oct 13	CO_2 concentrating mechanisms (C4 and CAM) Factors affecting photosynthesis		
Oct 20	Photosynthesis in a changing planet	Homework #2	10/27/25
Oct 27	Sucrose and starch synthesis	Exam #2	10/29/25
	Module 3: Sugar use and transport		
Nov 03	Glycolysis and the TCA cycle Electron transport and ATP synthesis		
Nov 10	Alternative pathways for respiration Factors affecting respiration		
Nov 17	Phloem loading and unloading Phloem translocation		
Nov 24	*Thanksgiving (no classes)*		
Dec 01	Source-sink relations	Homework #3	12/03/25
Dec 08	Finals week	Exam #3	12/10/25