



Horticultural Physiology

HOS 4304 - 3 CREDITS

Monday, Wednesday, and Friday
11:45 AM to 12:35 PM (5th period)
Fall 2020

COURSE FORMAT

This is a 100% online, synchronous course. Course lectures and interactive activities will take place during our scheduled meeting time (see below). Lecture audio will be published as a podcast to supplement student learning. Access links and all other learning materials will be published in Canvas.

INSTRUCTOR

Gerardo Nunez, Ph.D.

g.nunez@ufl.edu

Fifield Hall 1113

(352) 273 - 4765

Office hours: Tuesdays 9:30 AM to 10:30 AM via Zoom

COURSE DESCRIPTION

This course covers basic concepts and processes of plant physiology, including water relations, nutrient absorption, photosynthesis, respiration, and carbohydrate partitioning. In order to deliver meaningful mastery of these contents, this course utilizes a combination of lectures and active-learning activities.

LEARNING OBJECTIVES

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

- Identify the parts of the plant at the cellular, tissue, and organ level.
- Explain and create scientific graphs that illustrate environmental factors
- Summarize the physical and biological principles by which plants take up and transport water and nutrients
- Summarize the photochemical and biochemical phenomena that mediate carbon fixation and energy flux in photosynthesis and respiration
- Synthesize how environmental conditions and cultural practices impact water and nutrient uptake, photosynthesis, respiration, and - ultimately - horticultural productivity

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. So, access to reliable technology is paramount to student success. You will need to have access to a personal computer and broadband internet to watch lectures, participate in class, and take exams. Make sure that you have a strong internet connection. Hint: 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. During class and during exams, you will need a working microphone and web camera.

COURSE GRADE

1. Class participation 10 points

At the beginning of every class, two students will be chosen at random and asked to provide a 2-minute verbal summary of the previous lecture. Additionally, throughout the course there will be opportunities for students to interact with the instructor by asking or answering questions. Class interaction and class summaries will be graded according to the rubrics below. The sum of your class summary and class interaction scores will be used as your participation grade. These scores will be updated in canvas after each exam. If you are absent or late on the day you are called to give your verbal summary, you will receive a 0, unless you have a properly documented excuse.

Frequency of class interaction	Score
Never	1
Rarely	2
Sometimes	3
Often	4
Always	5

Quality of class summary	Score
Poor	1
Fair	2
Good	3
Very good	4
Excellent	5

2. Exams 60 points

Students will be evaluated through three cumulative exams administered in Canvas with HonorLock. Each exam will be graded out of 20 points. Exams will include short- and long-answer questions focused on the most-recent 5 weeks of lecture material. Exams #1 and #2 will take place during regularly scheduled classes. Exam #3 will take place during finals week at the time indicated by the University

Registrar (see dates below). Practice exams will be available a week before each exam and an after-hours review session will be held the evening before each exam.

Exam	Date
Exam #1	10/09/20
Exam #2	11/06/20
Exam #3	12/18/20 12:30PM – 2:30PM

3. Crossword puzzle

10 points

This course includes over 100 technical terms. We will use crossword puzzles to help you learn these terms and incorporate them into your vocabulary. During the week prior to each exam, you will create or answer a crossword puzzle that contains terms and definitions from the 5 most recent weeks of lecture. Each crossword puzzle should have a minimum of 20 words and all definitions should be scientifically accurate. Students will be randomly assigned to either create or solve the crossword puzzle for exams 1 and 2. Then, students will select to either create or solve puzzles for exam #3. These crossword puzzles will serve as study tools for exams. Crossword puzzles will be due 48 hours before each exam in Canvas. This rubric will be used to score them.

Item	Score range
A. The crossword puzzle contains scientifically accurate definitions.	0 – 1.34 points
B. Terms in the crossword puzzle are properly spelled and relevant to lecture topics.	0 – 1 points
C. The crossword puzzle contains a minimum of 20 terms from the 5 most recent weeks of lecture.	0 – 1 points

4. Homework

20 points

Students will be evaluated through three homework assignments. These assignments will contain short- and long-answer questions aimed at connecting plant physiology knowledge with horticultural and/or ecological performance. Students can refer to personal notes, textbooks, and other sources, but they must work individually. 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 10 points. Your two highest scores will be used to compute your final grade.

GRADING SCALE

A	=	92 – 100 points	B	=	< 87 - 83 points
A-	=	< 92 - 90 points	B-	=	< 83 - 80 points
B+	=	< 90 - 87 points	C+	=	< 80 - 77 points

C	=	< 77 - 73 points	D	=	< 67 - 63 points
C-	=	< 73 - 70 points	D-	=	< 63 - 60 points
D+	=	< 70 - 67 points	E	=	< 60 points

Additional information on current UF grading policies for assigning grade points can be found here:

- *Grading policy*, www.catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

COURSE POLICIES

Attendance

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 should 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, 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

Zoom Etiquette

Students are expected to be respectful learners. As such, you should arrive to and leave from class on time. Your microphone must be muted upon joining the Zoom room. You do not need to activate your webcam, but 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. Students who engage in disruptive behavior during a class period will be marked absent and/or asked to leave the room.

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).

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. I will reply to all emails within 2 business days of receiving them. For additional recommendations, consult:

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

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/

Academic Honesty

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 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. For more information regarding the Student Honor Code, please see:

- *UF Honor Code*, <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

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 when appropriate.

Campus Resources

If you are experiencing crises or personal problems that interfere with your general wellbeing, I encourage you to utilize the university’s counseling resources. The UF Counseling and Wellness Center provides confidential counseling services at no cost for currently enrolled. Additionally, resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *Counseling and Wellness Center*, 3190 Radio Road, 392-1575, www.counseling.ufl.edu
- *Career Connections Center*, CR-100 Reitz Union, 392-1601, www.career.ufl.edu
- *U Matter We Care*, www.umatter.ufl.edu/
- *Student Success Initiative*, <http://studentsuccess.ufl.edu>

Students with Disabilities

The Disability Resource Center (DRC) coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

If you would like to request classroom accommodations, you must first register with the DRC. The DRC will provide you with documentation that you must deliver to the instructor when requesting accommodations.

- *Disability Resource Center*, 0020 Reid Hall, 392-8565, www.disability.ufl.edu

Course Evaluation Process

Student assessment of instruction is an important part of the effort to improve teaching and learning. At the end of the semester, you are expected to provide professional and respectful feedback on the quality of instruction in this course. Guidance on how to give feedback in a professional and respectful manner is available here:

- *Providing professional and respectful feedback*, <https://gatorevals.aa.ufl.edu/students/>

Students will be notified when the evaluation period opens, and they can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via:

- *Course evaluations*, <https://ufl.bluera.com/ufl/>

Student Complaints

You can file and resolve any complaints about your experience in this course in the following site:

- *Student complaints in online courses*, www.distance.ufl.edu/student-complaint-process

Diversity

The University of Florida and I place great emphasis on affirming the diversity of the student body. Student, faculty, and staff interactions with others from varied backgrounds and experiences foster a superior educational environment and nurture a healthier, more accurate understanding of how our increasingly global and multicultural society operates.

I encourage you to engage in meaningful intra- and inter-culture dialogue and support a climate that is grounded in respect and inclusion for individuals of all of races, ethnic backgrounds, genders, and sexual orientations.

HORTICULTURAL PHYSIOLOGY

Schedule of Topics

Fall 2020

Week of	Lecture topics
Aug 31	Introduction to the course The plant cell
Sep 7	Plant tissues, tissue systems, and organs Morphology of horticultural plants
Sep 14	Water potential and water movement
Sep 21	Stomatal function Transpirational flux equation
Sep 28	Daily transpiration patterns Factors affecting transpiration
Oct 5	Ion movement across the plasma membrane Nutrient movement from soil to leaf
Oct 12	Light-dependent reactions of photosynthesis CO ₂ fixation reactions (C ₃)
Oct 19	CO ₂ fixation reactions (C ₄ and CAM) Factors affecting photosynthesis
Oct 26	Optimizing photosynthesis for horticultural production
Nov 2	Respiration (Glycolysis, TCA cycle)
Nov 9	Respiration (Electron transport, ATP synthesis)
Nov 16	Factors affecting respiration
Nov 23	Sucrose and starch synthesis
Nov 30	Phloem loading and unloading Phloem translocation
Dec 7	Sink allocation Growing an award-winning tomato
Final Exams week	Exam #3