Horticultural Physiology
HOS 6932 - 3 CREDITS
FALL 2020

MEETING TIMES AND LOCATIONS
Monday, Wednesday, and Friday 11:45AM to 12:35 PM (5th period)
Gainesville section: Fifield Hall room 2316
REC sections: Zoom meeting number XXX-XXX-XXX
Weekly Journal Club Sessions 2 hours TBD

INSTRUCTOR
Gerardo Nunez, Ph.D. g.nunez@ufl.edu
Fifield Hall 1113
(352) 273 - 4765
Office hours: Wednesdays 3:00 PM to 4:00 PM

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

LEARNING OBJECTIVES
• 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 comprise photosynthesis and respiration
• Synthesize how environmental conditions and cultural practices impact water and nutrient uptake, photosynthesis, respiration, and - ultimately - horticultural productivity
• Summarize, analyze and critique primary literature
• Moderate a journal club discussion about a recently published plant physiology article
COURSE MATERIALS

Textbooks
There is no required textbook for this course. The following textbooks can be used as reference materials 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”, “Course Materials”, and “Assignments” 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

COURSE GRADE

1. Exams

Students will be evaluated through three cumulative exams. Each exam will be graded out of 20 points. Exams will be comprised of short- and long-answer questions focused on the most-recent 5 weeks of lecture material. Exams #1 and #2 will take place during regularly-schedule classes. Exam #3 will take place during finals week at the time indicated by the University Registrar. See below for dates. An after-hours review session will be held the evening before each exam at a time and location TBA.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
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<tbody>
<tr>
<td>Exam #1</td>
<td>09/30/20</td>
</tr>
<tr>
<td>Exam #2</td>
<td>11/04/20</td>
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<tr>
<td>Exam #3</td>
<td>TBA week of 12/14/20</td>
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2. Journal Club

The purpose of this exercise is to practice clear and concise communication, and to introduce students to the peer-review process. Students will select a primary literature article related to the course material, about which they will prepare a written summary/critique and subsequently lead a journal club discussion. Articles should be selected from a reputable, peer-reviewed journal (e.g. JASHS, Tree Physiology, Frontiers in Plant Science, etc.) published within the past five years. The following are examples of appropriate articles:


Every student is required to read, understand, and comment on every article. Thus, the topic should be readily understandable by those with a basic plant science background (avoid jargon-heavy or overly specific topics). A total of 40 grade points can be earned from the following components:

**Article Summary**

After selecting their journal article (prior to their oral presentation), students will write a one-page (single spaced, 12-point font) summary and critique of their article. Students will receive feedback on their summary from the instructor. Then, they will revise and resubmit their report for grading. This process is designed as a facsimile for the peer-review process, which is essential for professional writing.

**Oral Presentation**

Students will present the research paper they selected to the class using carefully crafted visual aids and handouts (15 min). Then, presenters will lead the discussion about future research directions and the novelty and/or limitations of the presented article (30 min). Presentations and discussion will be graded according to the following rubric:

<table>
<thead>
<tr>
<th>Item</th>
<th>Score range</th>
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<tbody>
<tr>
<td>A. The oral presentation effectively communicated research context, methods, and findings from the article.</td>
<td>0 – 5 points</td>
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<tr>
<td>B. Visual aids were complemented oral delivery (as opposed to mapping it).</td>
<td>0 – 5 points</td>
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<tr>
<td>C. The presentation was clear, concise, and well-rehearsed. Technical issues were absent or minimal.</td>
<td>0 – 5 points</td>
</tr>
<tr>
<td>D. The presenter effectively led the discussion by asking or answering questions to/from the audience.</td>
<td>0 – 5 points</td>
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**Discussion Participation**

Students are expected to read every article and submit a 250-word summary the night before the journal club meeting. Students will also actively participate in the journal club by asking or answering questions and sharing their insight and perspectives.

**GRADING SCALE**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>92 – 100 points</td>
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<tr>
<td>A-</td>
<td>&lt; 92 - 90 points</td>
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<tr>
<td>B+</td>
<td>&lt; 90 - 87 points</td>
</tr>
<tr>
<td>B</td>
<td>&lt; 87 - 83 points</td>
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</table>

Syllabus - 3
B- = < 83 - 80 points
C+ = < 80 - 77 points
C = < 77 - 73 points
C- = < 73 - 70 points
D+ = < 70 - 67 points
D = < 67 - 63 points
D- = < 63 - 60 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 a photo book. Students will contribute to the creation of the course photo book by emailing the instructor a clear photo of their face during the first week of the semester.

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

Classroom Etiquette
Students are expected to be respectful learners. As such, you should arrive to and leave from class on time. Students attending the class or journal club via Zoom must be online 5 minutes before the start of the class period. Activities such as talking, texting, sleeping, eating, and studying for other classes should be avoided. Students who repeatedly engage in disruptive behavior during a class period will be marked absent and/or asked to leave the room.

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 repertoire. Thus, the instructor places great emphasis on coaching and participating in professional, context-specific written communication.
All course-related email communication should be polite, professional, and as different from a text message as possible. For additional recommendations, consult:
• Email etiquette, www.advising.ufl.edu/docs/ProfessionalEtiquette.pdf

In addition to content, all written assignments will be evaluated with respect to proper spelling, grammar, punctuation, word usage, clarity, coherence, and organization. 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.
Academic Honesty
In 1995, the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to this standard.

The Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied:

“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior. Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course. Additionally, all work submitted for credit by students will be analyzed with originality-checking software to detect any academic misconduct.

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 a wealth of confidential, free counseling services to enrolled students.

- Counseling and Wellness Center, 3190 Radio Road, 392-1575, www.counseling.ufl.edu

Additionally, if you would like orientation on choosing a major, finding an internship, or planning your career, I encourage you to use the university’s on-campus resources.

- Career Connections Center, CR-100 Reitz Union, 392-1601, www.career.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, disability.ufl.edu

**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 races, ethnic backgrounds, genders, and sexual orientations.

**Course Evaluations**
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/](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/](https://ufl.bluera.com/ufl/)
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<thead>
<tr>
<th>Week of</th>
<th>Lecture topics</th>
<th>Journal Club</th>
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<tbody>
<tr>
<td>Aug 31st</td>
<td>Introduction to the course&lt;br&gt;The plant cell</td>
<td>Tutorial session: Reading scientific papers”</td>
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<td>Sep 7th</td>
<td>Plant tissues, tissue systems, and organs</td>
<td>Tutorial session: Effective scientific presentations.</td>
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<td>Sep 14th</td>
<td>Water potential and water movement</td>
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<td>Sep 21st</td>
<td>Stomatal function&lt;br&gt;Transpirational flux equation</td>
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<td>Sep 28th</td>
<td>Daily transpiration patterns&lt;br&gt;Factors affecting transpiration</td>
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<td>Oct 5th</td>
<td>Measuring evapotranspiration</td>
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<td>Oct 12th</td>
<td>Ion movement across the plasma membrane&lt;br&gt;Nutrient movement from soil to leaf</td>
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<td>Oct 19th</td>
<td>Light-dependent reactions of photosynthesis&lt;br&gt;CO₂ fixation reactions (C3)</td>
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<td>Oct 26th</td>
<td>CO₂ fixation reactions (C4 and CAM)&lt;br&gt;Factors affecting photosynthesis</td>
<td>Student presentations</td>
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<td>Nov 2nd</td>
<td>Measuring photosynthetic rates</td>
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<td>Nov 9th</td>
<td>Respiration (Glycolysis, TCA cycle)</td>
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<td>Nov 16th</td>
<td>Respiration (Electron transport, ATP synthesis)</td>
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<td>Nov 23rd</td>
<td>Factors affecting respiration</td>
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<td>Nov 30th</td>
<td>Sucrose and starch synthesis</td>
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<td>Dec 7th</td>
<td>Phloem loading and unloading, Sink competition&lt;br&gt;Growing an award-winning tomato</td>
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<tr>
<td>Dec 14th</td>
<td>Exam #3</td>
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